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2021

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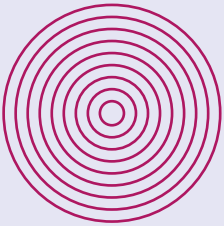
Note

The aim of this pocket guide is to bring together all the relevant information about the European Cooperation in Science and Technology (COST) into a user-friendly publication. This guide includes information on the COST programme, the open call for proposals, the running Actions, the networking tools, and the COST National Coordinators (CNCs). More than 232 running Actions are presented and complementary Actions' information can be found on the COST website: www.cost.eu.



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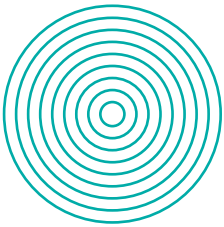
INTRODUCTION

COST ACTIONS

COST COORDINATES

INTRODUCTION



About us

Growing ideas through networks

The European Cooperation in Science and Technology (COST) is an EU programme funding interdisciplinary research networks in Europe and beyond. These networks, called COST Actions, provide open spaces where researchers and innovators can connect, collaborate, and grow their ideas together.

Since its creation as an intergovernmental framework in 1971, COST has been the leading networking tool in building the European Research Area (ERA) and aims at strengthening Europe's capacity to address scientific, technological, and societal challenges.

A yearly highlight is the COST Open Call dedicated to the creation of pan-European research networks in all science and technology fields. COST's funding exclusively covers collaboration activities such as meetings, workshops, and conferences, with the intention to complement national research funds.

COST has three strategic priorities:

- **Promoting and spreading excellence;**
- **Fostering interdisciplinary research for breakthrough science;**
- **Empowering and retaining young researchers and innovators.**

COST is bottom-up, meaning that researchers can create a network based on their own research interests and ideas by submitting a proposal through a continuous COST Open Call regardless of the field of interest. COST Actions are highly interdisciplinary, open (it is possible to join ongoing Actions), and have multi-stakeholders, often involving the private sector, policymakers as well as civil society.

By anticipating and complementing the activities of other EU framework programmes, COST acts as a bridge to less-supported research communities in COST Members defined as Inclusiveness Target Countries (ITCs)[1]. It also enhances the mobility of researchers across Europe and fosters scientific excellence.

1 Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, the Republic of Moldova, Montenegro, Republic of North Macedonia, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Turkey

What is a COST Action?

A COST Action is a network:

- open for researchers and innovators;
- collaborating in fields of science and technology of common interest to the COST Members[2];
- based on a joint work programme lasting four years;
- answering to the COST Open Call for proposals.

A COST Action is open to:

- all fields of science and technology (including new and emerging fields);
- all types of institutions (academia, public institutions, SME/industry partners, NGOs, European/international organisations, etc.);
- all career stages (both young and experienced);
- all COST Members, as well as Near Neighbour Countries[3] (eligible for COST support) and third states (International Partner Countries)[4].

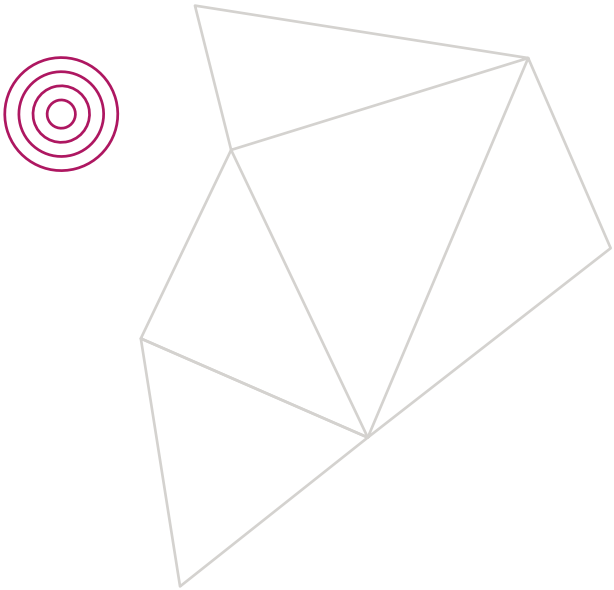
The COST programme does not fund research but provides support for networking activities carried out within COST Actions – find out more about them on page 13. Participants of a COST Action can therefore collaborate through a range of networking tools, such as meetings, conferences, workshops, short-term scientific missions, training schools, virtual networking grants, publications, and dissemination activities.

2 Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Republic of Moldova, Montenegro, the Netherlands, Republic of North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, Israel (Cooperating Member) and South Africa (Partner Member).

3 Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Kosovo*, Lebanon, Libya, Morocco, Palestine**, Russia, Syria, Tunisia, and Ukraine. *This designation is without prejudice to positions on status and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence. **This designation shall not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue.

4 International Partner Countries already participating in COST Actions include: Argentina, Australia, Bangladesh, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Ecuador, Ethiopia, Hong Kong, India, Iran, Iraq, Japan, Kenya, Republic of Korea, Kuwait, Kazakhstan, Malaysia, Mexico, Nepal, New Zealand, Nigeria, Pakistan, Peru, Republic of Rwanda, Saudi Arabia, Senegal, Singapore, South Africa, Thailand, Taiwan, Uganda, United Arab Emirates, United States of America, Uzbekistan, Venezuela and Vietnam.

The average budget of a COST Action is indicatively EUR 150,000/year for a typical network with participants from 30 COST Full/Cooperating Members. In this booklet you will find a wide range of COST Actions that can be joined at any time.



Two ways of joining the COST programme

A. Submit a proposal to set-up a COST Action

A COST Action proposal can be submitted at any time. Proposals are collected once a year. The submission, evaluation, selection, and approval (SESA) procedure ensures a simple, transparent, and competitive evaluation and selection process, in line with COST's bottom-up, open and inclusive principles.

Proposers benefit from a one-stage submission via the e-COST online tool. The proposal requires filling in a few sections online and uploading a technical annex of up to 15 pages.

A proposal evaluation comprises:

- a remote peer-review evaluation by three independent external experts;
- a review and validation of the evaluation reports by ad-hoc review panels. Their composition is tailored to the topics of the proposals received at a collection. Their members are selected from a pool of experienced researchers from COST Members.

Finally, the Scientific Committee, composed of independent, internationally renowned, high-level experts selects the final proposals to be submitted to the Committee of Senior Officials (CSO) for approval.

Proposers of approved COST Actions can benefit from training and mentoring through the COST Academy[5].

Guidelines for the SESA procedure and evaluation criteria are available on the Open Call webpage: www.cost.eu/opencall.

5 The COST Academy offers dedicated training and mentoring to both the main and secondary proposers of approved COST Actions, who are potential candidates for leadership positions. The aim is to boost the leadership, management, administrative and communications skills of young and/or ITCs researchers.

B. Participate in an existing COST Action

There are different ways of participating in a COST Action:

1. As a Working Group member

Working Groups perform the tasks to fulfil the objectives of the network's project plan, as described in their Memorandum of Understanding[6]. To participate as a Working Group member, contact the Action's Chair or the MC member(s) from your country to discuss your potential contribution. Apply for Working Group membership on the list of COST Actions in the website.

2. As a participant in COST Actions' activities

During their lifetime, Actions provide opportunities to get involved in activities through training schools, short-term scientific missions, workshops, conferences, etc. To participate in one of these, follow the offers on the listing page of the Action you are interested in or get in touch with the Action's Chair or the MC member of your country.
In addition, you may wish to represent your COST Member, liaise with the scientific community in your country and be responsible for the coordination, implementation and management of an Action. In that case you can ask the COST National Coordinator (CNC) of your country (see page 264), to nominate you as MC member. For each Action, up to two representatives per COST Member can be nominated to the MC.

Where to find all that information?

Go to the COST webpage, search for the Action you are interested in: for each Action you will find contact details for the Chair, the Working Group leaders, the national MC members and a link to the Action's own website.

6 Once an Action has been selected, COST Members can nominate their representative to the management of their network (MC members). The Memorandum of Understanding for each COST Action is available on the COST webpage under the Action code.

COST Action networking activities

1. Meetings, workshops and conferences

Meetings are organised by Management Committees (MC) in any COST Member participating in the network. They can be of different types, such as MC meetings, working group meetings, workshops or conferences. They may be open to the wider community and provide opportunities to enhance the COST Action's visibility. COST will contribute to the travel and subsistence expenses of the invited participants as well as to the expenses of organising the meeting.

2. Short-term scientific missions (STSMs)

These scientific missions allow researchers involved in a COST Action to visit an institution or laboratory in another COST Member/ Cooperating Member or Near Neighbour Country participating in the Action. Their aim is to foster collaboration and share new techniques and research infrastructure that may not be available in a participant's home institution or laboratory. STSMs provide a good opportunity for both young and experienced researchers looking for mentoring and lifelong learning.

3. Training schools

Training schools offer intensive training on an Action topic at the premises of one of the Action participants. Trainees are typically, but not exclusively, young researchers from across Europe. These schools can also offer researchers from any career stage, lifelong learning opportunities.

4. Conference Grants

These grants are aimed at young researchers from Inclusiveness Target Countries and help individuals attend beneficial international conferences that are not organised by COST Actions.

5. Virtual Networking Grants

COST has developed two new types of Grants to fill the rising need of digital tools to ensure continuity of COST Actions' activities:

- Virtual Networking Support (VNS) Grants. These grants aim at promoting virtual collaboration to complement traditional ways of collaboration within the research and innovation communities;
- Virtual Mobility (VM) Grants. These grants aim at strengthening the existing networks by allowing researchers to foster collaboration in a virtual setting, to exchange knowledge, learn new techniques, disseminate, and share the Action results.

6. Communication, Dissemination and Valorisation strategy

COST Actions are encouraged to inform all relevant stakeholders about the scientific achievements of the Action. This shall be in line with the principles of Open Science and Open Access in dissemination. Their aim is to valorise their results, facilitating their uptake by the European research and innovation community and society at large.

The dissemination of scientific results achieved by the Actions is essential to COST. We support Action participants to share the outcome of their research to other COST networks, the wider scientific community, policymakers, the media and general public. Dissemination and communication channels are available for the Actions, such as dissemination grants, publications, online and social media, news releases, events, success story releases, dissemination meetings, etc. More information about the networking activities and their eligible cost can be found in the Annotated Rules for COST Actions.

How to find your Action in this booklet

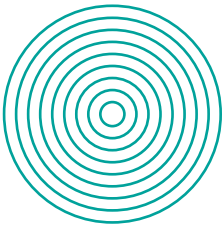
This booklet includes 232 Actions that can be joined at any time before the end of the network's funding period. To help you identify specific research fields within each group of Actions, the table on page 16 shows the scientific fields by the Organisation for Economic Co-operation and Development (OECD) covered by each COST Action.

We recommend you view the scientific fields that match your research background or your interest and read the abstracts of the Actions belonging to those fields. Alternatively, you can also find Actions of your interest keywords on COST website.

All Actions have a title and a number. The Action's numbering is based on a seven-character code that is used mainly for the internal classification of the networks. The letters CA refer to "COST Action", the first two digits to the year of the collection date, the third number to the sequential number of the collection date (1 or 2), and the last two digits to the running number (for example: CA20105 refers to a COST Action submitted in the first collection date in the year 2020 and approved under running number 1 [05]).

You can find out more information about Actions included in this booklet on the COST webpage and on Actions' individual websites indicated after each Action's abstract.

COST Actions



COST Actions starting in 2021
(and finishing in 2025)

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA20101		■					18
CA20102	■						19
CA20103			■	■			20
CA20104			■				21
CA20105					■	■	22
CA20106	■			■			23
CA20107					■	■	24
CA20108	■						25
CA20109		■					26
CA20110	■						27
CA20111	■						28
CA20112					■		29
CA20113	■						30
CA20114		■					31
CA20115					■		32
CA20116	■	■					33
CA20117			■				34
CA20118	■	■		■			35
CA20119			■				36
CA20120		■					37

COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
CA20121			■				38
CA20122	■		■				39
CA20123					■		40
CA20124	■	■	■				41
CA20125	■			■			42
CA20126		■					43
CA20127		■					44
CA20128		■	■	■			45
CA20129	■		■				46
CA20130	■	■					47
CA20131					■		48
CA20132	■	■		■			49
CA20133		■					50
CA20134					■	■	51
CA20135	■		■				52
CA20136	■	■					53
CA20137					■		54
CA20138	■	■		■	■		55
CA20139		■					56
CA20140	■						57

Plastics monitoRIng detectiOn RemedIaTion recoverY

PROPOSER: Dr Stefania Federici (IT) stefania.federici@unibs.it

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The "Plastics monitoRIng detectiOn RemedIaTion recoverY – PRIORITY" Action aims to develop a research network focused on developing, implementing, and consolidating strategies to tackle the global challenge of micro- and nano-plastics environmental pollution. The Action will create a broad and skilled transdisciplinary network to establish a 360-degree view combining the partners' expertise in chemistry, physics, life science, engineering, standards, economy, and law. This network will maximize the European competitiveness in creating a robust infrastructure for scientific communication, exchange, and collaboration to foster new research activities and citizen science. PRIORITY aims to enhance the technical standards for sampling and analysis of micro and nanoplastics in the environment, to develop a more reliable assessment of exposure and biological effects, and to advance activities in terms of remediation and recovery of the environment. The scientific community, economy and all the European citizens will benefit from the outcomes of the activities. One of the targets is the harmonization of the European regulation associated with microplastics related issues. The Action will then support European Commission regulations organisms in critical aspects of environmental and ecosystems protection, food safety, and life science.

Marine Animal Forest of the world

PROPOSER: Dr Sergio Rossi (IT) sergio.rossi@unisalento.it

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Major marine biodiversity hotspots occur within and around extended three-dimensional communities known as Marine Animal Forests (MAFs). MAFs are biotic assemblages mainly composed of suspension-feeding organisms like sponges, gorgonians, hard corals, bryozoans, bivalves, etc., that form erect canopies like the trees or shrubs on land, thus creating underwater forests. As Aichi targets have been impossible to achieve by 2020, we need networks that allow working together for the same objective, with special attention to marine ecosystems as the MAFs. These submersed forests provide ecosystem services which are essential for hundreds of million people worldwide. In this UN decade of the oceans we aim to provide the scientific basis for understanding and preserving the ecosystem services of the MAFs throughout the world. These ecosystem services are under increasing anthropogenic pressure and need a clear unifying picture to be shared with stakeholders and public. Developing a common protocol and gathering a consensus on the most appropriate tools to study and understand the animal forests' role will ultimately inform management, restoration and conservation initiatives. The network aims to develop an integrative vision that will fuel research and steer future policies on crosscutting sustainability-driven issues related to the fragmented governance of these benthic ecosystems in coastal and open ocean waters, creating cross-sectoral platform for partners across academia, policymaking and civil society, offering inclusive spaces for a transdisciplinary dialogue. We will also unify the protocols for restoration of the MAFs of the World, with nature-based solutions, to face climate change, natural disasters, and food supply.

Biosecurity Enhanced Through Training Evaluation and Raising Awareness

PROPOSER: Dr Alberto Allepuz (ES) alberto.allepuz@uab.cat
FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Biosecurity is of paramount importance to prevent the introduction and spread of pathogens and, consequently, to preserve the health of farmed animals. Healthier animals result in better animal welfare, better sustainability of animal production systems and less antimicrobial use. Despite these benefits, biosecurity is limited by different factors: i) lack of knowledge on ways for improvement, especially in extensive systems or settings with low resources; ii) shortage of adequate ways to enhance communication; iii) diversity of methodologies to assess and measure the implementation of biosecurity measures and their cost-effectiveness and iv) low number of trained professionals. To approach these challenges, the Action will evaluate how biosecurity is currently used and will use participative approaches to understand motivators and barriers for biosecurity implementation. Knowledge generated through them will act as the baseline upon which to develop adequate communication and training on biosecurity. The Action will also perform a comparison of existing methods used to evaluate biosecurity. Exploiting these tools will promote the development of tailored options in farms based on the evaluation of their risks, on the feasibility of selected biosecurity measures and on their economic benefits. Moreover, the Action will identify training needs through the evaluation of existing training materials and will develop new courses, increasing therefore the number of trained professionals. Finally, the Action will recommend priority research areas for future biosecurity improvement in animal production systems. The Action objectives will be achieved through a transdisciplinary group where Early Career Investigators will play a key role in their attainment.

CA20104

Network on evidence-based physical activity in old age

PROPOSER: Prof Michael Brach (DE) michael.brach@wwu.de
FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Sedentary lifestyle in old age is associated with increased risk of chronic and disabling diseases, premature mortality, and substantial economic burden for society. Increase in physical activity (PA), on the other hand, may compensate the negative effect of ageing and reduce the inactivity costs. However, not all exercise regimens are universally effective, and Inter-individual differences in responses to exercise training exist. Therefore, there is an urgent need for creating "tailored" exercise programs that will fit the specific needs of the various and diverse ageing populations. A critical step towards this goal is embracing an evidence-based medicine (EBM) approach where conceptual challenges and pitfalls in basic research and clinical research on ageing and physical activity could be identified and addressed. Unmet needs and gaps in research and practice that currently hinder successful implementation of EBM for training of older adults are: 1) Lack of consolidated research information needed for designing optimal, feasible and effective exercise programs for various target groups; 2) exclusion of disabled, low income and isolated older adults both research trials and exercise interventions; 3) Lack of real-world conditions studies over long periods and 4) Limited use of technological innovations for assessing, applying and enhancing exercise programs in old populations. The main aim of the COST Action PhysAgeNet is to establish a network that will foster evidence-based research and practice of physical activity in old age and will enhance integration of innovative technological solutions in order to promote health and reduce the burden of inactivity in ageing populations globally.

Slow Memory: Transformative Practices for Times of Uneven and Accelerating Change

PROPOSER: Prof Jenny Wustenberg (UK)
jenny.wustenberg@ntu.ac.uk

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

We are living in times of deep contradictions. While our world accelerates and grows smaller through superfast digital networks, it is also marked by widening socio-economic disparities. We face viral pandemics, rapid species extinction, increased automation of work, quick fixes for mental health, political upheavals and displacements of old certainties. Adaptation and resilience to these challenges must draw on past experiences and cultural resources – this can only happen if we slow down and take time to remember well. This Action addresses the need for increased interdisciplinarity in our understanding of how societies confront their past to contend with environmental, economic and social changes brought on by sudden events and by slow and creeping transformations. The future of peace, prosperity, politics, work and climate will depend upon how we remember socio-cultural and political changes. Transformative practices of remembrance – as objects of study and as critical interventions – will be shared collaboratively across Arts and Sciences in order to reveal the ways in which humans confront large-scale processes of change. This Action will uniquely focus the attention of scholars, policymakers and cultural professionals on alternative paths to build resilience in the face of contemporary rapid-response culture. Through transnational and interdisciplinary discussions, we will address urgency, emergency, crisis and acceleration by drawing together the 'multi-sited', 'eventless' and slow-moving phenomena that can best be studied by 'slowing down' our research methods, to afford capacity building, knowledge generation and impact activities. Inspired by 'slow science' (Stengers 2018), we seek an alternative kind of social remembering.

Tomorrow's 'wheat of the sea': Ulva, a model for an innovative mariculture

PROPOSER: Prof Spiegel Mordehai (Muki)
(IL) shpigelm@gmail.com

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

A growing interest in the development of oceanic coastal shores has arisen over the past decade, seeking alternative sustainable food sources and other valuable products. Our initiative aims at exploiting the potential of marine seaweeds in Europe. Building on the successes of previous EU and pan-European projects on seaweeds, and due the unique characteristics of the genus Ulva (Linnaeus, 1753), we have identified these green algae as the most suitable candidate and model organism for a novel kind of European mariculture. Much of the knowledge on Ulva, generated in diverse scientific disciplines and different communities, is not easily comparable nor is it shared among scientists, stakeholders, end users and the public. This COST Action proposes an innovative conceptual pathway to address these issues, significantly improving knowledge in the biology of the most promising Ulva spp., capitalising on their economic potential, and exploring commercial applications in the human food, animal feed, pharmaceutical industries and ecosystem service. The COST Action combines interdisciplinary approaches to the sustainable use of marine resources, encompassing all the facets of Ulva biology, ecology, aquaculture, engineering, economic and social sciences. This Action will lead to the development of advanced science, create business and job opportunities in the maritime and coastal economies, and have a significant impact on societal welfare. This COST Action fulfils the current 'Societal Challenges Priorities' of European Horizon 2020 strategy for food security, and its application will contribute to the UN Sustainable Development Goals 14 (UNSDG) to conserve and sustainably exploit natural resources.

Connecting Theory and Practical Issues of Migration and Religious Diversity

PROPOSER: Dr Milda Alisauskiene (LT)
milda.alisauskiene@vdu.lt

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

"Connecting Theory and Practical Issues of Migration and Religious Diversity" (COREnet) is an interdisciplinary network that aims at knowledge production, knowledge exchange and capacity building across Europe in the intersection of migration and religious diversity with a particular emphasis on bottom-up research. The background of the network is the pressing social situation that is characterised by the fact that migrants and Syrian war refugees coming to Europe, have become one of the major political issues and social challenges during the past years. Research, capacity building and exchange are important tools to analyse what lies behind these challenges and possible solutions. The network aims thus to contribute to overcoming divisions within and across European countries with the help of innovative approach that would add to existing social scientific knowledge on migration and religious diversity the study of religions and theological insights explaining the narratives of migrants and refugees. Drawing in researchers from all stages of their careers, and across different European countries, training a new generation of interdisciplinary action researchers capable of connecting study of religions and theology and the social sciences, and working that into action through processes of co-production. This network brings the bridging of knowledge with stakeholders – governmental, non-governmental and media organizations working in the field of diversity management on the local and national levels.

FAIR NEtwork of micrometeorological measurements

PROPOSER: Dr Branislava Lalic (RS) branislava.lalic@polj.edu.rs

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The current state of weather-induced agricultural losses, water use for irrigation, the appearance of new invasive species and disease vectors (strongly depending on micrometeorological conditions), new environmental zoning of plant diseases and pests, deforestation, increased urbanization, rural-to-urban migration and increased urban energy consumption for cooling/heating impose scientific and societal request to provide micrometeorological knowledge share platform (Micromet_KSP) in order to communicate: a) compiled an inventory of available and quality proven micrometeorological in situ data sets on the European level and beyond, b) measurement and data management recommendations designed in order to meet FAIR principles and avoid temporal and spatial gaps, c) examples of rural and urban FAIR data sets and d) Q&A exchanged between Action members, stakeholders, specialized user groups and the general public. The FAIRNESS action intends to improve standardization and integration between databases/sets of micrometeorological measurements that are part of research projects or local/regional observational networks established for special purposes (agrometeorology, urban microclimate monitoring). Addressing identified challenges requires an effective transboundary network of researchers, stakeholders (extension services and environmental agencies, local authorities and ministries, SME) and civil society (specialized and general public) from Europe and beyond to identify and fill knowledge gaps, standardize, optimize and promote new environmental-tailored measurement and control procedures, enhance research effectiveness and improve dissemination.

Modular energy islands for sustainability and resilience

PROPOSER: Prof Carlos Rebelo (PT) crebelo@dec.uc.pt

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The MODENERLANDS Action aims to merge and systematise the efforts of the European Research and Development (R&D) groups working on Sustainable Energy and the related technologies, in particular wind and wave energy sources, by proposing pathways for incorporation and by promoting the relevant synergies in Research, Education and Training in order to enhance Sustainability in the built environment. MODENERLANDS revisits safe, smart, modular, cost-effective and socially valuable high performance sustainable Energy Islands for consideration in the plans, design and development of the future sustainable energy infrastructure. Looking forward to future development, MODENERLANDS will work with Modularised Construction of Offshore Floating Platforms aiming at easily extending their size and capacity according to future energy needs. The concept of Modular Energy Island will act as a platform to maximise collection and conversion of the renewable energy sources and efficiently transfer them to the network, exploring cutting-edge Green Hydrogen related technologies for efficient energy storage and transportation. MODENERLANDS will promote synergies that will offer breakthrough scientific developments leading to new concepts and R&D outcome and thereby contributing to the strengthening of the European research and innovation capacities on Sustainable Energy Applications along the European Green Deal lines. The proposed European Network will develop a European-based scientific and technological network with strong scientific multi-/inter-disciplinary features that will work on the exploitation of the research outcomes related to Modular Sustainable Energy Islands by integrating all related stakeholders, thereby intensifying the links among scientific and research groups and Sustainable Energy industry.

RNA communication across kingdoms: new mechanisms and strategies in pathogen control

PROPOSER: Dr Amy Buck (UK) a.buck@ed.ac.uk

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

A new frontier in RNA biology has emerged in the last decade with findings that RNA is found outside of cells and can transmit information between cells, organisms and species as a form of communication. Pathogens can also exploit extracellular RNA (exRNAs) to enable their infections and exRNAs are associated with numerous infectious diseases in both animals and plants. However there are large gaps in knowledge on exRNA mechanisms, such as how exRNAs are selected for export, how they traffic outside the cell, how they integrate into a functional pathway in a recipient and how pathogens exploit these mechanisms. While there are coordinated efforts to advance exRNAs as biomarkers in the USA, the focus is primarily on exRNA detection in body fluids. Advancing the budding field of exRNA and harnessing its potential in understanding and treating disease urgently requires mechanistic understanding. exRNA-PATH will promote European leadership in this field by integrating a network of investigators examining exRNA communication mechanisms across diverse biological systems, with a specific focus on host-pathogen interactions. exRNA-PATH will facilitate an integrated approach to advancing the exRNA field and aligning applications with sustainable development goals in infectious disease and pest control based on coordinated objectives: i) define an agenda for exRNA research that is rooted in mechanistic understanding, ii) align investigators across diverse biological systems (animals, plants, microbes, fungi) and iii) bridge communication between different stakeholders in the exRNA field to create new synergies and innovative solutions to medical, societal and environmental challenges.

European Research Network on Formal Proofs

PROPOSER: Mr Frédéric Blanqui (FR) frederic.blanqui@inria.fr

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

If testing can reveal errors in computer programs, only formal verification can guarantee their absence. The highest Evaluation Assurance Levels of the Common Criteria for Information Technology Security Evaluation require automatically checked mathematical proofs of correctness. Proofs are also the basis of mathematics and many sciences, and thus are very important in education and research. In many computer technologies, developers and users rely on standard languages and protocols for exchanging data and enabling tool interoperability: TCP/IP for network communication, HTML for web pages, etc. This is however not the case for formal proofs, which is a major bottleneck for their adoption by the industry. The main reason is that, currently, proof systems use mutually incompatible logical foundations. Fortunately, only small parts of the proofs developed in a system use features that are incompatible with other systems. Europe is a leading actor in the area of formal proofs: about 65% of the proof systems of the world are developed in Europe, including the two most used proof assistants, Coq and Isabelle. This action aims at boosting the interoperability and usability of proof systems and making formal proofs enter a new era. For the first time, it gathers all the developers and users of proof systems in Europe. To make the proofs exchangeable, they will express, in a common logical framework, the logical foundations of their systems and develop tools for inter-translation of the proofs developed in individual systems to and from this common logical framework.

PlatfoRm OF policy Evaluation community for improvED EU policies and Better ACKnowledgement

PROPOSER: Mr Gábor Balás (HU) internationaloffice@hetfa.hu

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The Action PROFEEDBACK aims to foster the networking of the policy evaluation community at EU-level, raise awareness on the importance of evaluation policy research and improve its impact on policy-making. The Platform, following a bottom-up and open approach, will gather researchers and professionals from various scientific fields and sectors to present and evaluate theories, topics, tools and methods of policy evaluation. Results of the Europe-wide assessment of good practices will provide direct and high-quality inputs for national and EU bodies responsible for policy evaluation. Policy evaluation is a key tool in understanding, developing and modernising EU policies, thus there is a growing demand for EU-wide and high quality evaluation services. The main challenge is that currently there is no bottom-up platform for European researchers and professionals working in policy evaluation. They have limited possibilities to discuss common problems, assess country specific practices and share their knowledge in a mutually beneficial and effective way. PROFEEDBACK aims to tackle this challenge with an innovative, complex, cross-sectoral and multidisciplinary approach by: analysing the theoretical and methodological questions of evaluation policy research putting special focus on Cohesion Policy, enriching scientific research of policy evaluation and addressing new challenges, harmonizing fragmented approaches to set the research agenda and to get a common understanding, contributing to the capacity building of the policy evaluation community, involving national and EU policy-makers and the civil society to contribute to evidence-based policy-making, framing a Code of Conduct for the policy evaluation community.

A sound proteome for a sound body: targeting proteolysis for proteome remodeling

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The ProteoCure COST Action aims at fostering research and innovation in the field of proteolysis with the goal of manipulating the proteolysis machinery for the development of novel, specific and efficient therapies. Proteins are essential molecular actors in every cellular process. From their synthesis to their degradation, they are subject to continuous and precise quality control mechanisms to ensure that they properly and timely take on their functions to fulfil cellular needs. Proteolysis (i.e. degradation of proteins) is a key biological process that directly controls individual protein levels. It also ensures the degradation of abnormal proteins. Malfunctions of the proteolysis machinery leading to accumulation of deleterious proteins or in the opposite to excessive degradation of beneficial ones are implicated in multiple human diseases such as cancers, neurodegeneration, developmental and aging disorders, as well as in infectious diseases. Therefore, manipulating the proteolytic machinery to control abundance of specific proteins is a strategy of enormous potential for therapeutic intervention. ProteoCure will gather European researchers from the academic, clinical, and industry sectors, interested to develop a knowledge-based network fostering research on this issue. By organizing community-building activities, fostering synergies among European scientists and reinforcing the training of the next generation of European researchers, the Action will allow creation of a large and creative exchange hub focusing on normal and pathologic proteolysis, and on the development of innovative tools modulating the level of specific protein(s). The final aim is to facilitate the translation of novel discoveries into products of clinical and/or economical value.

Therapeutical applications of Cold Plasmas

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Despite scientific and technological progress in the medical field, the treatments available today are still not completely effective concerning the fight against cancer, tissue regeneration and repair or drug-resistant pathogens, including newly emerging infections. Besides, some of the currently associated therapies associate high economic and/or societal costs. In this sense, Cold Atmospheric Plasmas have emerged as a powerful technique involving a vast number of reactive species (molecules, atoms, ions, electrons, photons, UV & visible radiation) which have demonstrated to affect cells through complex biochemical procedures, opening a great window of opportunity in the novel area known as Plasma Medicine. This has led to an exponential increase in the research in different areas of plasma medicine, including cancer, tissue regeneration and repair and antimicrobial action which are the focus of this MedPlasma COST Action. However, many challenges still threaten this promising field to move forward, such as clarification of the mechanisms involved in the therapeutical action of plasmas and plasma-conditioned liquids, insufficient standardization, or an urgent need for enhanced dialogue and interaction between scientists (plasma experts, biologists), medical doctors or industry among others. In these circumstances, this MedPlasma COST Action aims at establishing a synergistic network that articulates researchers, the medical community, industry or patient associations, among others, and coordinate the European activity in this domain to foster the leadership of Europe in this emerging field.

European Network on International Student Mobility: Connecting Research and Practice

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Over the past decades, international student mobility in higher education has expanded rapidly. This growth has sparked a considerable interest in international student mobility (ISM) within different disciplines, research communities, and circles of practitioners and policy makers. However, there is surprisingly little connection and exchange among ISM researchers across these spheres. In addition, ISM scholarship remains strongly restricted to scientific circles, despite the relevance that scientific knowledge on ISM has for the formulation of policy recommendations and for transferring best practices to stakeholders' daily work. This Action responds to the pressing need for systematic interdisciplinary and international exchange of knowledge on theoretical frameworks, research methodologies, findings, and best practice examples in the field of ISM, and for translating scientific findings into recommendations for ISM practice. It is organised around four major thematic areas, namely: 1) Global ISM flows and trends at the macro-level; 2) Social inequalities in access to and during ISM; 3) The social and cultural integration of international students in their host countries; 4) The impact of ISM on graduates' careers. The Action brings together established, early-career investigators (ECIs) and PhD students from different scientific disciplines, countries, and research communities as well as stakeholders from international offices, international student and study abroad organizations, and different policy levels. The Action will offer comparative and practical insights into ISM dynamics by bringing fragmented knowledge together, with the main aim of generating new interdisciplinary and innovative empirical perspectives on the phenomenon and translating these into tangible recommendations for stakeholders.

European Network for Innovative and Advanced Epitaxy

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

The world is now facing challenges affecting our daily-life that include, among the most acute, health care, energy, telecommunications, sustainable industry, smart cities and climate action. The successful response to these challenges lies on our ability to solve technological roadblocks related to the development of advanced devices. Material science is at the heart of technological developments. Especially, epitaxy has always been the most powerful technique to fabricate/manufacture materials while controlling their properties at nanoscale, enabling the development of advanced devices. Today, material development becomes more vital than ever. To break down the barriers limiting the development of more efficient devices, continuous innovation is essential. To build the foundation of new epitaxial and material science solutions, a European-level structure in epitaxy is today crucial to enhance knowledge sharing at wide scale thanks to cross-community discussions and exchanges. The COST Action "European Network for Innovative and Advanced Epitaxy", named OPERA, will build a new and innovative European Network composed of expert communities in epitaxial growth focusing on different materials classes: conventional semiconductors, oxides and 2D materials. It aims to bridge the gap between traditionally separated scientific communities, both academic and industrial, having the common goal to combine complementary knowledge, push further the material maturation, and exploit epitaxial combinations of the different material classes in order to unveil new properties and produce new functionalities. Based on this organization, the OPERA COST Action will foster interdisciplinary collaborative research activities allowing maintaining European epitaxy at the topmost worldwide level of research and innovation.

Converting molecular profiles of myeloid cells into biomarkers for inflammation and cancer

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Myeloid immune cells are important mediators in the pathology of many diseases, especially in diseases associated with chronic inflammation (DACI). Recent advancements in molecular profiling technologies have led to the generation of large data sets, many of those not fully explored yet, but accessible to the entire scientific community via public data repositories. It is the aim of this COST Action to repurpose those data sets, retrieve and curate myeloid cell-specific information, and apply this information to develop novel biomarkers for DACI. To this end, MyeInfoBank will utilise COST networking tools to enable the interaction of molecular biologists, bioinformaticians, immunobiologists, biobank coordinators and clinicians. The concerted activity of these experts on myeloid cell biology (either basic or clinical research) MYE, bioinformatics INFO, and bio-banking BANK, will transform complex molecular information into standardised and applicable biomarkers, which have the potential to improve clinical decision making in a number of socio-economically important diseases.

Three-dimensional forest ecosystem monitoring and better understanding by terrestrial-based technologies

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Forest ecosystems across the world are facing high pressures due to climate changes. In many areas, they are in a transition to adopt the changes. However, many are damaged in this process. It is crucial to make forest ecosystems more resistant to face these challenges, through resilience strengthening and close-to-nature forestry. Implementing such approaches and monitoring their progress requires accurate knowledge about forest ecosystems that rely on a forest in situ data at high spatial and temporal resolution. Novel terrestrial-based technologies will play an important part to face these challenges. Such technologies have experienced a fast development in recent years. The forests can now be observed and monitored in a very high spatial and temporal resolution that was not possible even a few years ago. Researchers and practitioners are facing a unique opportunity to deepen the understanding of forest ecosystems and to change the forestry to adopt the climate, environment and industrial changes. Various research groups across EU and beyond are testing such technologies or developing processing algorithms for precision forestry and forest ecology. But further cooperation is strongly required. 3DForEcoTech project aims to establish a strong network of scientists and stakeholders (i.e. practitioners) and sensor manufacturers to synchronise the knowledge, to develop general protocols and algorithms for forest ecosystem state survey and forest functioning, and to make these novel technologies available to a broad audience. Specifically, 3DForEcoTech will develop protocols for data acquisition, processing, fusion for forest inventory and ecological applications, and will establish open-data and open-source algorithm databases.

CA20119

European andrology network– research coordination, education and public awareness

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

ANDRONET aims to boost research collaboration, education and public awareness in andrology, a field of science that deals with male health. Currently there are no European- or world-wide networks through which researchers and clinicians in andrology can interact. The need for such a network is urgent due to the increasing incidence of infertility and testicular cancer, worrying reports of an association of poor reproductive function with poor health, and male predisposition to serious diseases, including Covid-19, leading to shorter life expectancy in men. Male infertility is common, but the patients are currently treated through assisted reproduction technology with primary burden on women. The aetiology of male reproductive problems is heterogeneous and comprises complex interactions between multiple genes and epigenetic factors, with largely unknown impact of environmental factors including infections. This COST Action proposes to increase multidisciplinary research collaboration and data exchange among andrology centres, and transfer of knowledge to European countries with less developed research. The initial consortium includes centres comprising complementary clinical and research expertise at a very high level, but ANDRONET will expand to reach a critical mass necessary for obtaining new knowledge and its possible commercial exploitation across Europe. ANDRONET aims to improve professional education in andrology which is fragmented among several medical branches and will contribute to the recognition of andrology as a medical subspecialty at European level. ANDRONET will strive to properly inform the public with evidence-based knowledge and thereby increase awareness of increasing male health problems and contribute to development of preventive measures.

Intelligence-Enabling Radio Communications for Seamless Inclusive Interactions

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

INTERACT vision is to go beyond the capabilities of the 5G vision and to make the radio network itself intelligent. This is required in order to enhance the human experience of both human-to-human and humanto-machine communications, and make it seamless, with the perception of no intermediary. Machine learning is an important tool in implementing this vision, since along with advanced network architectures and distributed content provision, it provides a means of implementing many aspects of this network intelligence. However, its use must be informed by theoretical and experimental research on radio channel models, network architectures and signal processing algorithms.

Bench to bedside transition for pharmacological regulation of NRF2 in noncommunicable diseases

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Non-communicable diseases (NCDs) such as cancer, diabetes, cardiovascular, neurodegenerative, respiratory or immune diseases, account for 77% of all deaths in the EU and remain the most prevalent and without effective therapy. Networking among multidisciplinary teams that face disease from a perspective of causative pathomechanisms rather than clinical symptoms is the most appropriate approach to overcome this problem. Such pathomechanisms imply the loss of homeostatic functions leading to the pathologic formation of reactive oxygen species, chronic inflammation, metabolic unbalance and proteinopathy. The transcription factor NRF2 is a master regulator of multiple cytoprotective responses and a key molecular link among many NCDs. It provides a unique strategy for drug development and repurposing that is now starting to be translated to the pharmacological and clinical arena. This Action will build a network of excellence for integrating and spreading the existing knowledge and providing innovative services, drugs and tools related to NRF2-pharmacology, with the final goal of boosting the translation to the European industry sector. To achieve this, the Action has already gathered a wide set of professionals from different disciplines (medical chemistry, pharmacology, clinical research, molecular biology, bioinformatics, etc.) and sectors (universities, research centres, hospitals, biobanks, biotech SMEs and pharma companies, etc.). At present the action accounts 24 COST countries (66,7% ITC) plus 2 IPCs and 2 NNC. Among 73 proponents, 7 are SMEs, 18 are ECIs and 53.4% are women. Thanks to COST tools the Action will boost the career of young researchers, wide participation (especially from ITC countries), and spread excellence.

Harmonizing clinical care and research on adrenal tumours in European countries

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Adrenal tumours affect more than 3% of the population aged > 50 years, and their absolute prevalence is increasing due to population aging. Most of these tumours are benign and hormonally inactive. However, 2-10% of them are at risk of malignancy, and 20-40% present hormone over-secretion, leading to significant morbidity. Management of adrenal tumours is quite heterogeneous, and this leads to substantial inequality in patient care throughout Europe. In this context, the goal of HARMONISATION is to constitute a multidisciplinary network to harmonise clinical care and research on adrenal tumours throughout Europe. Our focus will be on COST Inclusiveness Target Countries (ITCs). In addition, this collaborative network will establish a modern framework to develop a new generation of real-time and real-life randomized clinical trials, which will be federated and registry-based. For this purpose, HARMONISATION will be organized in five Working Groups: 1) Harmonizing clinical practice for adrenal tumours; 2) Harmonizing adrenal tumour research and -omics practice; 3) Harmonizing Information Technology/Artificial Intelligence (AI) tools towards a standardized registry; 4) Harmonizing the ethical and legal framework required for federated European trials; and 5) Communication, dissemination, and inclusiveness. The successful execution of HARMONISATION's goals is guaranteed by the collaboration of clinicians, researchers, and experts from other relevant fields, including artificial intelligence, data science data protection, legal and ethical issues, and patients' representatives.

Intergovernmental Coordination from Local to European Governance

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Achieving coordination between executive actors of territorial units is one of the major challenges of today's politics. External effects and thus the interdependence of political actions beyond borders of sovereign authority have increased dramatically, necessitating better coordination of decision-making and actions across territorial units as well as across levels of government in an increasingly complex environment. The effectiveness and legitimacy of democratic governance in modern States depends crucially on their coordination ability. There is still a serious lack of knowledge among scholars and practitioners on how to organize and process intergovernmental coordination in those various instances. Moreover, there is still no systematic connection between the various research communities dealing with the issues from their separate perspectives, such as federalism, European governance or local and regional governance scholars. IGCOORD aims at connecting those different strands of research to provide systematic and comparable insights in the institutions, mechanisms and processes of intergovernmental coordination in the horizontal and in the vertical direction, across levels of government, policy sectors and territorial units. More specifically, it aims at 1) collecting comparative evidence, 2) distilling basic mechanisms and causal explanations from analytic comparison, 3) developing new collaborative research questions and 4) disseminating those insights and results to inform real-world policy-making. IGCOORD is particularly well suited to tackle those challenges because it links expertise that remained unrelated to date from different countries, (sub-)disciplines and problem situations. Fundamentally, only a broad and diverse network of scholars can generate innovative insights and produce knowledge relevant to the political practice.

Maximising impact of multidisciplinary research in early diagnosis of neonatal brain injury

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Five in every 1,000 babies born each year have a condition linked to brain injury. For newborn term infants, lack of oxygen is a common cause of injury; for premature infants, an immature cardiovascular system can lead to brain injury. These injuries can result in death, cerebral palsy, or neurodevelopmental delay. Early diagnosis is essential for risk stratification and targeted neuro-protective strategies. Central to an early diagnosis is continuous brain monitoring. The AI4NICU Action will create a pan-European multidisciplinary network with the clinical and technical expertise required to bring artificial intelligence (AI)-enabled decision-support tools to the neonatal intensive care unit (NICU). These AI tools build on existing cot-side technologies, such as the electroencephalogram, by including machine-learning algorithms to detect biomarkers of brain injury. Neuro-physiological data sets are limited in size and scope and not freely available; AI4NICU will develop the tools necessary to acquire, pool, share, and manage data. These data are often complex and noisy, and standards for developing and appraising machine-learning algorithms are lacking; AI4NICU will create a framework to develop, test, and compare these algorithms. A lack of coordinated effort, sometimes exacerbated by a disconnect between clinicians and scientists/engineers, impedes progress; AI4NICU will expand the research community, consolidate existing fragmented efforts, and create and enhance productive synergies. Working with all stakeholders, AI4NICU will identify roadblocks to clinical implementation and propose designs for clinically useful prototypes. This Action will address the urgent, unmet need to reduce the potentially catastrophic life-long consequences of neonatal brain injury.

Applications for zoosporic parasites in aquatic systems

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FUNDING PERIOD: November 2021 – November 2025

SUMMARY

Zoosporic parasites (i.e. fungal and fungal-like aquatic microorganisms) constitute important drivers of natural populations, causing severe mortality of host. Economic impacts of parasitic diseases are notable in microalgae biotech industry, affecting production of food ingredients and supplements, bioactive medicinal and biofuels. While scientific research on this topic is gaining traction by increasing studies elucidating the functional role of zoosporic parasites in natural ecosystems, we are currently lacking integrated and interdisciplinary efforts for effectively detecting and controlling parasites in the microalgae industry. To fill this gap we propose to establish an innovative, dynamic European network connecting scientists, industries and stakeholders to optimize information exchange, equalize access to resources and to develop a joint research agenda. ParAqua aims at compiling and making available all information on the occurrence of zoosporic parasites and their relationship with hosts, elucidate drivers and evaluate impacts of parasitism in natural and man-made aquatic environments. We aim to implement new tools for monitoring and prevention of infections, and to create protocols and a Decision Support Tool for detecting and controlling parasites in the microalgae biotech production. Applied knowledge on zoosporic parasites can feed-back from industry to ecology, and we therefore will explore whether the developed tools can be applied for monitoring lakes and reservoirs. Short-Term Scientific Missions and Training Schools will be organised specifically for early-stage scientists and managers – with a specific focus on ITC – with the aim to share and integrate both scientific and applied expertise and increase exchange between basic and applied researchers and stakeholders.

Network for research, innovation and product development on porous semiconductors and oxides

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

The NETPORE COST Action will create an international network of world-class researchers and stakeholders to promote joint ideas and initiatives aiming to bridge the gap between fundamental developments and practical applications of technologies based on porous semiconductors and oxides. Recent fundamental advances in porous semiconductors and oxides have demonstrated promising performances of these platform technologies for a broad range of energy and health applications. But the bench-to-bedside translation of these advances remains challenging. Current factors preventing these technologies from reaching the market are: product reliability, cost-effectiveness of production, uncertain long-term performance and benchmark reference, and added value of final product. NETPORE COST Action network will foster cutting-edge research and innovation in this technological field by providing opportunities for joint projects through Working Groups, bringing together a wide pool of expertise across academia and industry. NETPORE COST Action network will: i) develop of a joint research roadmap to boost the transfer of knowledge by coordinating strategies among different actors with the objective of addressing big societal challenges in energy, health and the environment, harnessing advanced technologies using porous semiconductors and oxides; ii) act as a platform to further advance potentially marketable technologies by identifying strengths and weaknesses, needs and requirements of markets; iii) create venues to disseminate these technological advances and provide technical formation activities for young emerging researchers; and iv) promote networking activities in order to attract talent, build more and better joint research projects with clearly defined objectives to exploit technological advances and open exciting new business opportunities.

Waste biorefinery technologies for accelerating sustainable energy processes

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

By 2030, the bio-based economy is expected to have grown significantly in Europe. One of the pillars of this bioeconomy is the concept of BIOREFINERY, the sustainable processing of several kinds of waste and biomass into a spectrum of marketable products and energy. While in the past many research efforts have been conducted towards understanding, modelling and designing conversion processes that can sustain a true circular economy, this KNOWLEDGE IS QUITE FRAGMENTED and UNEVENLY DISTRIBUTED across Europe. Several countries lack proper policies and public engagement to endeavour the challenges ahead. HARMONIZATION must start on ROBUST KNOWLEDGE, and the ability to cover the WHOLE VALUE-CHAIN, from source materials up to the markeatable products... and that's WIRE mission. The WIRE COST Action broadly organizes into 4 KEY WORKING GROUPS (WG) that bring together experts from ACADEMIA, INDUSTRY and TECHNOLOGY TRANSFER organisations and range 1) Raw Materials, 2) Biorefinery Conversion Technologies, 3) Biorefinery Applications and 4) Communication and Dissemination. These WG will proactively contribute to i) Promote circular economy, ii) Promote bioenergy and bioeconomy, iii) Promote Research & Innovation in the field iv) Promote applied research towards biorefineries implementation v) Promote EU-wide harmonisation of the scientific and technical approaches, thus facilitating ENGAGEMENT WITH POLICY-MAKERS and industry vi) Pave the ground for a more effective link with the relevant INDUSTRY sectors and gathering their interest. A series of meetings and events are planned to deliver the main aim of influencing positively the future landscape in Science and Technology in this important field of BIOREFINERIES.

Promoting Innovation of ferMENTed fOods

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FUNDING PERIOD: November 2021 – November 2025

SUMMARY

Present in all European diets, fermented foods (FF) hold a strategic place due to the benefits they offer in terms of nutrition, sustainability, innovation, cultural heritage and consumer interest. The potential of FF for improving human health but also driving food innovation and local production in the next decades has become highly relevant. The challenge is therefore to federate the scientific community and other key stakeholders working on FF. We want to collectively advance scientific evidence of their health benefits, building a benefits/risk approach in order to promote multi-modal innovation and respond to the expectations of different European communities. The long-term goal of PIMENTO is to place Europe at the spearhead of innovation on microbial foods, promoting health, regional diversity, local production at different scales, contributing to economical and societal development as well as food sovereignty. To respond to this challenge, the scientific and non-scientific community need to join forces and co-construct a multi-stakeholder vision and dynamic in the field of FF. A COST Action is the best means of building this network and enabling this long-term vision to become reality. The wide variety of stakeholders engaged will enable PIMENTO: i) to tightly connect and clarify scientific knowledge on health aspects of FF ii) to tackle technical, societal and legislative bottlenecks behind FF-based innovations iii) to contribute to the establishment of long-term scientific workplaces iv) to disseminate widely define scientific knowledge on FF and define strategic roadmap for future joint research.

Multiscale Irradiation and Chemistry Driven Processes and Related Technologies

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Radiation is an inevitable element of the world. It may affect life and likely was involved in its origin. The fundamental understanding of radiation was often at the heart of the most important scientific and technological breakthroughs (Maxwell theory, Einstein photo-effect, relic radiation, synchrotron, FEL, etc.) and it remains so. One of the big current challenges concerns the quantitative understanding of the complex processes in various systems, including the living ones, induced by their irradiation by photons, charged particles, or neutrons. These processes may lead, for instance, to the therapeutic effects of radiation, new pathways for the controlled fabrication of nanosystems with desired properties, energy conversion and storage, catalytic activity, or be in the heart of technologies for the construction of novel light sources. Despite a large variety of possible applications, the fundamental principles of irradiation-driven processes in different systems are similar. One of such features is the multiscale spatiotemporal nature of the processes extending the direct outcomes of irradiation over large time-&-space dimensions and linking them to a variety of relevant phenomena. The advances in this interdisciplinary area became possible only recently due to the development of powerful computers and modern experimental techniques. The Action MultIChem aims to establish a broad international interdisciplinary intersectoral cooperation aiming to advance our fundamental understanding of the multiscale irradiation-driven processes and related technologies paving the path towards major scientific and technological breakthroughs, and socio-economic impacts. These goals require a pan-European approach and COST is the most appropriate instrument for their realization.

European MIC Network – New paths for science, sustainability and standards

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Microbiologically Influenced Corrosion (MIC) is a phenomenon that is increasingly becoming a problem for our society. MIC describes the negative effects a material can experience due to the presence of microorganisms. In Europe, several research groups and other industrial stakeholders are already dealing with MIC. Unfortunately, the discussions are fragmented and the exchange of information is limited. A true transdisciplinary approach of the MIC topic is hardly ever experienced, although this would be logical for this material/biology related challenge. USA, Canada and Australia have strong networks, and develop methods, prevention measures and standards, which we are forced to use, since we do not have a network and combined knowledge to design them according to European standards. This makes us extremely dependent and in some cases, we cannot use these measures or standards because the suggested solutions are prohibited by European laws (e.g. the use of some biocides). Therefore, it is important to initiate a new European MIC network. We need to combine our efforts as experts in different fields and develop our own prevention measures, in close cooperation with industry and plant operators and owners of critical infrastructure. This COST Action will provide the necessary interaction and communication, knowledge sharing, training of personnel and of researchers of different disciplines. We will take a leading role in this process, bringing our own ideas on an equal level with other nations, taking into account our values and attitudes (e.g. environmental protection) and representing greater protection for people, property and the environment.

Efficient Justice for All: Improving Court Efficiency through EU Benchmarking

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Legal systems all over Europe increasingly suffer from congestion. As the number of court cases increases, the ability of legal systems to produce high-quality, timely court decisions appears to be under pressure. Societal costs of this inefficiency in our legal systems are enormous, as EU citizens, firms and (local) governments face uncertainty, incur legal expenses and are forced to postpone decisions that are often key to furthering investment, wellbeing and growth.

This COST proposal is built on the idea that the only way we can face his challenge head on, is by exploiting the differences in institutional, legal and economic circumstances in EU countries to identify best practices. This idea in itself is not new, and has for example been successfully applied to the benchmarking of electricity networks in EU countries. Likewise, a comparison of legal systems does not have to start from scratch, as a lot of the codification that is required has already been done.

With this proposal, we want to take the crucial next step: by bringing together a strong team of experts in benchmarking with a strong focus on how to handle the heterogeneity that is present in Europe

Urban Tree Guard – Safeguarding European urban trees and forests through improved biosecurity

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Green infrastructure, including urban forests, has been proposed by European Commission as a strategy to support climate adaptation capacity and sustainable development in the urban areas where over 70% of the EU's population live. Alarmingly, the green infrastructure and especially its characteristic elements, trees, are increasingly threatened by alien pests (insects and pathogens) that are introduced via trade and transports. In a new environment, these pests may become invasive, causing devastating environmental and economic losses, and threatening also unique cultural values such as those linked to veteran trees. The current biosecurity system fails to capture alien pests that often also benefit from the altered climate. New tools and better integration of different knowledge pools are urgently needed to support better biosecurity in urban settings. The Action will bring together a pan-European and international network of scientists and stakeholders to meet this challenge. The network will 1) Collect, share and harmonize scientific and stakeholder knowledge, 2) Accelerate development of innovative technological tools and solutions for biosecurity purposes, 3) Inform policy and support implementation of the EU plant health regime while providing science-based recommendations for decision makers, especially at operational levels, 4) Foster an inclusive and open research environment, with explicit support to young professionals, and 5) Increase European competitiveness in the field of biosecurity, improving also the quality of everyday life for people, especially urban dwellers, in Europe and beyond. A co-created Wiki database, teaching tools for education in urban forest health, and a decision support tool will ensure the long-term impacts of the Action.

Cross-border transfer and development of sustainable resource recovery strategies towards zero waste

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FUNDING PERIOD: September 2021 – September 2025

SUMMARY

Waste is being generated as a result of population growth, industrialization, and improvement of human standard of living. In the absence of efficient waste management systems, waste ends in landfills and in the environment (through informal discharges) leading to pollution and to a linear economy. Due to increasing awareness of the deleterious effects on the environment and human health, policies are being gradually implemented to motivate a mindset shift from linear to circular (bio)economies and decouple economic growth from use of resources. Full waste recycling and valorisation will play a crucial role in the establishment of sustainable circular (bio)economies. Although waste recycling and valorisation strategies have started to be implemented across borders within Europe, their implementation level is not homogenous and harmonization is needed. FULLRECO4US is an answer to this need and will function as a discussion platform centred on holistic approaches to waste recycling and valorisation, and on the development of new cross-border interdisciplinary and intersectoral networks. These networks, in turn, will cooperate in the development of feasible and environmentally-friendly resource recovery approaches that can be translated into, e.g., competitive research funding applications and contribute to building research and innovation capacity within Europe and beyond. FULLRECO4US will include a set of networking activities such as Short-Term Scientific Missions, Workshops, Conference and Symposium attendance, supported by Working Groups focused on genesis of holistic approaches for waste recycling and valorisation, engagement of stakeholders, and on dissemination and communication of Action's results to enhance impact, consensus, and harmonization of newly built strategies.

Traces as Research Agenda for Climate Change, Technology Studies, and Social Justice

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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

TRACTS brings scholars from disciplines of the social sciences and humanities, together with visual and sound artists, curators, decolonial activists, memorialization experts and legal professionals to bridge current cultural, political and geographical gaps in European research on traces. In response to the recent waves of populism, actors as diverse as environmentalists, human rights activists, and museum professionals have been confronting and creatively deploying the legacies of the long 20th century in Europe. This shows no sign of abating in a Europe marked by rapid technological, environmental and socio-economic changes. As such, mapping the challenges in the realms of social justice, climate change, and technological influence on society requires reflecting on and producing new understandings regarding trace. An inclusive, pan-European network which focuses on traces in the context of pressing challenges of social justice, climate change and technology can inform transformative research agendas and create new paradigms in social sciences and humanities. This Action gathers a critical mass of scholars and practitioners to create such a network at a crucial juncture of the European project. Focusing on the conceptual methodological and ethical challenge of traces, TRACTS develops a comprehensive research coordination and training program, including experimental knowledge production and training for future research leaders. TRACTS will host symposia, workshops, and research meetings to provide a platform for collaboration and exchange in order to advance the state of the art. These will lead to deliverables including joint publications, conceptual, ethical and methodological advancement, Traces Atlas, podcasts, exhibitions, mentoring, and a research database.

Improving biomedical research by automated behaviour monitoring in the animal home-cage

PROPOSER: Dr Sara Wells (UK) s.wells@har.mrc.ac.uk

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Animal use for scientific purposes is guided by the principles of 3Rs (Reduction, Refinement and Replacement). Developing refined experimental conditions can substantially improve animal welfare and importantly, enhance the translational value and data reproducibility. Novel and emerging technologies allow 24/7 collection of behavioural data in undisturbed mice, the most widely used species in biomedical research. These recently developed technologies minimize the impact of stressors, such as human interaction and testing in novel arenas, which are known to influence data collection and animal welfare. It is now possible to assess a more naturalistic behavioural profile in familiar environment, such as the animals' home-cage. In addition to promoting welfare, it can improve research in a wide spectrum of research fields ranging from psychology and neuroscience to translational psychiatry and neurology, and may further provide valuable insights into other types of pathologies and genetic alterations. However, addressing the complex problem of monitoring the full 24-hour behavioural repertoire of a rodent still presents many challenges, with each technology having its strengths and limitations. The aim of this Action is to bring together European organizations developing and using automated home-cage monitoring technologies, combining experts in mouse behaviour, laboratory animal science and data science, to critically and transparently assess the potential of these technologies, to develop user guidelines and standard operating procedures and to identify needs for further technological development, including analysis of big data. The Action will also contribute to building capacities for adoption of these technologies by holding workshops, laboratory rotations and disseminating knowledge.

Opportunistic precipitation sensing network

PROPOSER: Dr Vojtěch Bareš (CZ) baresvoj@cvut.cz

FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Despite advances in remote sensing, precipitation observations remain one of the weakest links in the description of Earth's water cycle. This is especially critical in the face of climate change, human-induced hydrologic changes e.g. due to rapid urbanisation, and consequent increase in frequency and magnitude of extreme events. Opportunistic sensing can greatly improve spatial and temporal resolution of standard precipitation monitoring networks on continental scale by complementing them with measurements from personal weather stations or devices primarily not intended for precipitation monitoring such as commercial microwave links or broadband satellite terminals. The number of opportunistic sensors has already now exceeded traditional in-situ observations by an order of magnitude, and it is increasing exponentially. Nevertheless, it is still unclear how to make this data operationally accessible, achieve robust quality control of these observations, and integrate them into standard observation systems. OPENSENSE brings together scientists investigating different opportunistic sensors, experts from national weather services, owners of sensor networks, and end-users of rainfall products to build a worldwide reference opportunistic sensing community. It will i) overcome key barriers preventing data exchange and acceptance as hydrometeorological observations ii) define standards to allow for large-scale benchmarking of OS precipitation products developing new methods for precipitation retrieval iii) coordinate integration of the opportunistic observations into traditional monitoring networks, and iv) identify potential new sources of precipitation observations. These coordinated activities will boost uptake of OS as precipitation observation methods and enable generation of high-quality precipitation products with unprecedented spatial and temporal resolution.

Making Early Career Investigators' Voices Heard for Gender Equality

PROPOSER: Prof Anne-Sophie Godfroy (FR)
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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Over the last decades, European higher education and research systems have been characterized by deep changes, due to globalization and marketization, that have dramatically transformed research careers. While doctoral and postdoctoral researchers constitute a fast-growing workforce, their working conditions have become increasingly precarious and their career prospects uncertain. Those processes tend to exacerbate and create new forms of gendered inequalities for Early Career Researchers (ECRs), first and foremost women – that have been magnified by the COVID-19 crisis (Gewin, 2020). Those inequalities are also reinforced by disparities within academia linked to other social determinants, such as origin, socioeconomic status, sexuality or ability. However, current institutional Research & Innovation (R&I) policies, including gender equality policies, rarely consider ECRs' specific challenges. Moreover, implementing efficient and impactful policies that promote sustainable gender equality remains a great challenge throughout R&I institutions. The main goal of this Action is thus to increase visibility of inequalities faced by ECRs from a gender perspective and to promote a sustainable dialogue between ECRs and stakeholders in the research ecosystem at the systemic level (European & national policy-makers) and at the institutional level (senior researchers, academic managers) by creating a community of gender equality practitioners composed of various stakeholders (ECRs, independent researchers, academic managers, organizations) across Europe. The Action has among its outcomes: training schools for ECRs, scientific publications by ECRs, recommendations & guidelines for academics and policy-makers.

Network on water-energy-food nexus for a low-carbon economy in Europe and beyond

PROPOSER: Prof Chrysi Laspidou (EL) laspidou@uth.gr
FUNDING PERIOD: September 2021 – September 2025

SUMMARY

An international network of researchers is working with policymakers and the business sector to better understand how the water-energy-food Nexus fosters policy coherence in the domains of water, energy and food, supporting the transition towards a circular and low-carbon economy in Europe. Focus is on job creation, enhancing wellbeing and care for the environment. The Nexus concept is tested at different scales (i.e. local, regional, national, European), while the international dimension is explored through the involvement of international proposers. More Nexus-compliant practices are foreseen through a knowledge sharing hub at European level and beyond. Public-private initiatives pave the path for nexus compliant practices, building on network members' advice. NEXUSNET will deliver examples of nexus compliant decision making, and recommendations to best achieve them, to come-up with an overview of Good Nexus Practices in Europe (policy coherence, nexus-compliant practices and more coherent nexus evaluations). Transdisciplinary approaches are adopted to test Nexus compliant practices with the involvement of relevant stakeholders, while interaction and engagement with current and finished Nexus-related projects will be pursued. Academic nexus knowledge will be translated into practical and applicable knowledge for the private sector or policy makers. A series of intense knowledge transfer and dissemination actions are planned to ensure that the network will have a significant impact in Europe and beyond.

Holistic design of taller timber buildings

PROPOSER: Dr Iztok Sustersic (SI)
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FUNDING PERIOD: October 2021 – October 2025

SUMMARY

With the worldwide construction sector being responsible for one third of carbon dioxide emissions, as well as forty percent of the world's energy use and waste production, a shift to sustainable and renewable construction techniques is crucial. Engineered timber, champion of the sustainable construction materials, has evolved to a stage that enables the construction of not only family housing but also taller buildings commonly built from concrete or steel. Unfortunately, designing taller buildings made from timber is more demanding than their concrete and steel counterparts. Whereas different designers (architects, structural, fire, acoustic engineers etc.) of concrete buildings can work almost independently, the design of taller timber buildings should be performed with intensive collaboration among the design team members. I.e. the acoustic insulation principles currently used in timber buildings are completely contrary to the design demands originating from wind or earthquake loading. This is just one case, unfortunately the list of design collisions is very long. It is therefore crucial to address taller multi-storey timber buildings from a collaborative and interdisciplinary perspective, considering static, dynamic, fire, acoustic, human health and other aspects in parallel and not in isolation. Only through interdisciplinary analysis and interaction can a set of holistic design guidelines be developed that will enable safe construction of taller timber buildings, as well as respect human wellbeing demands. This action proposal aims to achieve that through intense interdisciplinary work and interaction between different design backgrounds, as well as between academic and design professionals.

CorEuStem: The European Network for Stem Cell Core Facilities

PROPOSER: Dr Laura Batlle Morera (ES) laura.batlle@crg.eu
FUNDING PERIOD: October 2021 – October 2025

SUMMARY

Biomedical research has significantly advanced in the recent years thanks, in part, to the discovery of human induced pluripotent stem cells (hiPSCs), the development of CRISPR/Cas9 gene editing and the possibility of generating specific differentiation systems and more complex in vitro organ-like structures called organoids. These technologies have become key players in investigating disease modelling, embryology and for novel regenerative therapeutic approaches that currently enter first clinical trials. Core facilities in European research centers and universities providing services in these fields are becoming a reference hub for know-how for these technologies. Furthermore, they establish initial quality control standards and homogenize procedures to enhance reproducibility in biomedical research. However, one of the major challenges for core facilities is to keep track of all advancements in cutting-edge technologies. New protocols, reagents and tools continuously develop and need to be tested. Isolated technical platforms cannot follow the fast-moving technology pace. Therefore, there is an urgent need to join forces and link these core facilities to harmonize methodologies used to increase the overall reprodvucibility of the results produced in different labs, from different institutions within Europe and to increase their impact. CorEuStem is composed of experts in stem cell, differentiation, organoids and gene editing technologies with the aim of joining forces and establishing the first European network for harmonizing procedures and protocols, to organise joint training schools for implementing new cutting-edge technologies emerging in the field and to become a reference point in stem cells, differentiation, organoids and gene editing in Europe and beyond.

COST Actions starting in 2020
(and finishing in 2024)

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COST Actions	Natural Sciences	Engineering and technology	Medical and Health Sciences	Agricultural sciences	Social Sciences	Humanities	Pages
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CA19101

Determinants of Physical Activities in Settings

CHAIR: Dr Ciaran Mac Donncha (IE)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The COST Action "Determinants of Physical ActivitieS in Settings" (DE-PASS) is unique in focus, extent, constitution and as an effective Knowledge Transfer Platform (KTP). DE-PASS will focus exclusively on identifying, understanding and measuring the determinants which promote, maintain or inhibit Physical Activity Behaviours (PABs) across the lifespan and in different settings and translating this knowledge to assist policy makers to achieve greater health impact. European and global society is now largely physically inactive. The health, economic and social benefits of a more active society are enormous. DE-PASS will illuminate why individuals and/or societies adopt a physically active or inactive lifestyle. To date enormous energy has been invested by researchers in answering this question, however, the knowledge gained and the impact achieved through this investment is fragmented, not readily translatable and rarely transcends the state of the art. DE-PASS will achieve the following: 1) Use a settings approach (home, school, work etc.) to bridge the knowledge and translation gap; 2) enact a multi-disciplinary, Pan-European, international network (35 nations, 100+ proposers) of established, young and Early Career Investigators (ECIs) and policy makers; 3) exploit, consolidate and further integrate existing relevant expertise, evidence, resources and influence; 4) develop capacities and careers for ECIs; 5) provide a new European PABs conceptual framework, a best evidence statement and implementation guidelines for policy makers; 6) define and standardise European measurement protocols; 7) establish a new, high functioning, open access European database of determinants of PABs with a cohort extension and 8) define an evidenced based and aspirational Pan-European research harmonisation and implementation strategy.

https://depass.eu/

CA19102

Language In The Human-Machine Era

CHAIR: Dr Dave Sayers (FI) dave.sayers@cantab.net
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

"Within the next 10 years, many millions of people will be ... wearing relatively unobtrusive... devices that offer an immersive and high-resolution view of a visually augmented world" (Perlin 2016: 85). This is the 'human-machine era', a time when our senses are not just supplemented by handheld mobile devices, but thoroughly augmented. The language we see, hear and produce will be mediated in real time by technology. This has major implications for language use, and ultimately language itself. Are linguists ready for this? Can our theory, methods, and epistemology handle it? LITHME has two aims: to prepare linguistics and its subdisciplines for what is coming; and to facilitate longer term dialogue between linguists and technology developers. How will pervasive augmentation technology affect language in areas such as international law, translation, and other forms of language work? What will this mean for how people identify with specific languages? Could increasing reliance on real-time language technologies actually change the structure of language? Longer term, could developments in brain-machine interfaces serve to complement or even supersede language altogether? Linguistics would be far stronger for robust technological foresight, while developers would benefit from better understanding potential linguistic and societal consequences of their creations. Meanwhile LITHME would shine a light on the ethical implications of emerging language technologies. Inequality of access to technologies, questions of privacy and security, new vectors for deception and crime; these and other critical issues would be kept to the fore. LITHME would equip linguists and stakeholders for the human-machine era.

https://lithme.eu/

CA19103

LGBTI+ Social and Economic (in)equalities

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Challenge aims to address LGBTI+ (lesbian, gay, bisexual, trans, intersex and queer) social and economic (in)equalities at times of increased vulnerability for gender and sexual minorities in Europe. The Action will take concrete steps to break scholarly disciplinary silos, work across diverse cultural contexts and engage with Civil Society Organisations (CSOs) and the public at large. We will also work with government, non-governmental policy organisations, trade unions and businesses. With 30 joining members representing 14 European countries and 10 disciplines, three Working Groups (WGs) will be established in areas where social and economic inequalities shape the everyday lives of LGBTI+ people: Families and Communities; Employment and Economic Well-being; and Social and Legal Inclusion. Despite existing legal protections against discrimination, LGBTI+ individuals continue to face challenges in Europe, particularly in certain EU countries and neighbouring nations. These difficulties extend to research networking since academics often remain hidden. Data remains scarce since gender and sexual identity is not commonly surveyed. The network will bring in potentially less visible researchers from across the EU. New academics and PhD students will be mentored and advised on how to build successful careers in LGBTI+ studies. We will also work to encourage governments to include information on gender and sexual identities in data collection and to consider the specific challenges facing these groups when formulating policy initiatives. Broader networking will include the delivery of online courses, Training schools, Short-term Scientific and Policy Missions, and community engagement.

Advancing Social inclusion through Technology and EmPowerment

CHAIR: Dr geraldine leader (IE) geraldine.leader@nuigalway.ie
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Social inclusion is an important element of well-being for people with Autism Spectrum Disorder (ASD) and/or Intellectual Disability (ID). Research has highlighted that social inclusion is facilitated through access to education and employment. Despite this, people with ASD and/or ID have low rates of participation in these domains. Research has demonstrated that Assistive Technology (AT) shows great promise in increasing participation in education and employment. Notwithstanding recent technological advances, there are low rates of adoption of AT throughout Europe by service providers, educators, employers and policymakers. There are several areas of unmet need including: high abandonment rates of AT, lack of inclusion of people with ASD and/or ID in the research process, lack of interdisciplinary and intersectoral collaboration and poor match between technology and the individual with ASD and/or ID. The aim of the COST action is: Build an interdisciplinary, intersectoral pan EU and beyond, network which will enhance social inclusion and empowerment of individuals with ASD and/or ID. This will be achieved by: Evaluating the development of novel AT by providing an interdisciplinary and intersectoral collaboration between all stakeholders using a translational approach to establish standardised practice guidelines for design, development and deployment of AT. Creating knowledge, by providing a database of current AT technologies and their match to employment and educational contexts for users with ASD and/or ID. Promoting the adoption of evidence-based guidelines in relation to use of AT across settings and populations and propagating the use of inclusive design and rigorous research approaches.

CA19105

Pan-European Network in Lipidomics and EpiLipidomics

CHAIR: Dr Maria do Rosário Domingues (PT) mrd@ua.pt
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Lipids represent a wide variety of molecules that play different biological roles such as energy resources, structural components or signaling molecules that regulate metabolic homeostasis. Most notably, lipids and oxidatively modified lipids have been found to be involved in regulating important mechanisms mediating tissue injury, inflammation, and related noncommunicable diseases, which are responsible for near 70% of all deaths in developed countries. Lipidomics and Epilipidomics are the most promising strategies for the progress in the knowledge of lipids, aiming at biomarker discovery for the prevention, early diagnosis, monitoring, evaluation of diseases therapeutics. These approaches involve the use of complex protocols, different instrumentation and processing huge amounts of data. Effectiveness, while reducing the high costs associated with these technologies, requires a harmonized multidisciplinary approach involving coordinated actions from pan-European centres of lipidomics investigation. This will avoid unnecessary redundancy, improving reproducibility and ensuring efficient and productive research. LipidNET aims to build and maintain a multidisciplinary Pan European network of researchers, clinicians and enterprises working in the field of lipidomics and epilipidomics to boost a hub of research excellence, advanced knowledge and technology transfer, to promote high level of training for young researches and facilitate clinical translation. LipidNet will include five interactive working groups covering analytical methods and computational approaches in (epi)Lipidomics, clinical significance and applications, lipid signaling and mechanisms of action, dissemination and outreach. LipidNET will forester inclusive networking, promoting new opportunities for collaborative research projects, knowledge and technology transfer, dissemination, caring for young scientists and scientists from target countries, keeping gender balance.

http://www.epilipid.net

Multi-Sectoral Responses to Child Abuse and Neglect in Europe: Incidence and Trends

CHAIR: Dr Andreas Jud (DE) andreas.jud@uniklinik-ulm.de

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

In Europe, millions of children experience abuse or neglect at the hands of those who should care for them. Yet, how many of these children get help, which services they receive by which agency remains largely unknown. Moreover, countries are hardly aware which maltreatment turns fatal. This constitutes a major knowledge gap that is likely due to inconsistent ways of surveying and reporting on child maltreatment services across Europe. Without this information, we cannot know how the systems work, what additional preventive efforts are required, if the interventions fit the victims' needs or if the most vulnerable groups are properly identified. The proposed project addresses this gap by creating a network of experts in child maltreatment and relevant stakeholders and links them in working groups, in order to promote the development of a rigorous, consistent, and comparable methodology for the collection of surveillance data on child maltreatment and maltreatment-related fatalities. Researchers, policymakers, administrators and practitioners will identify best-practice methods of surveillance and recommend efficient ways of implementing them across Europe. Importantly, this network will invite youth and adult survivors of child maltreatment to collaborate in all working group decision-making processes. The four working groups within this network will focus on: 1) definition and operationalization of child maltreatment; 2) promoting secondary analyses; 3) participatory approaches to child maltreatment surveillance; and 4) implementation and dissemination. Final products of these projects will include guidelines for implementation of best practices in child maltreatment surveillance across Europe.

Unifying Approaches to Marine Connectivity for improved Resource Management for the Seas

CHAIR: Dr Audrey Darnaude (FR) audrey.darnaude@cnrs.fr

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

In a human-altered marine environment, fragmented and subjected to unprecedented climate change, planning sustainable strategies for development requires to understand the distribution of marine biodiversity and how its variations impact ecosystem functioning and the evolution of species. Functional Connectivity characterizes the migratory flows of organisms in the landscape. As such, it determines the ecological and evolutionary interdependency of populations, and ultimately the fate of species and ecosystems. Gathering effective knowledge on Marine Functional Connectivity (MFC) can therefore improve predictions of environmental change impacts and help refine management and conservation strategies for the Seas. This is challenging though, because marine ecosystems are particularly difficult to access and survey. Currently, >50 institutions investigate MFC in Europe, by using complementary methods from multiple research fields to describe the ecology and genetics of marine species. SEA-UNICORN aims at coordinating their research to unify the varied approaches to MFC and integrate them under a common conceptual and analytical framework for improved management of marine resources and ecosystems. For this, it will bring together a diverse group of scientists in order to collate existing MFC data, identify knowledge gaps, reduce overlap among disciplines, and devise common approaches to MFC. It will promote their interaction with connectivity theoreticians and ecosystem modelers, to facilitate the incorporation of MFC data into the projection models used to identify priorities for marine conservation. Lastly, it will forge strong working links between scientists, policy-makers and stakeholders to promote the integration of MFC knowledge into decision support tools for marine management and environmental policies.

https://www.sea-unicorn.com/

High-Temperature SuperConductivity for AcceLerating the Energy Transition

CHAIR: Prof Joao Pina (PT) jmmp@fct.unl.pt

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Superconductivity is a fascinating state of matter characterised by the absence of electrical resistivity that certain materials exhibit when cooled below a certain cryogenic temperature. Together with other unique properties, like the ability to carry huge currents and trap extremely large magnetic fields, superconductors pave the way for accelerating the Energy Transition. High-temperature superconducting (HTS) materials make possible more compact, efficient, and even disruptive technologies that can be integrated into all the links of the electrical energy chain, boosting its decarbonisation. Despite the potential benefits and successful demonstrators of HTS technologies, they still lack mass penetration in the electrical system. Several reasons pointed out by the industry include concerns on the cost of these systems; the uncertainty about cryogenics' reliability; and the idea that only top-skilled professionals will be able to operate the latter. Other causes relate a lack of systematic knowledge about the design of HTS systems for the grid, and on how to simulate their performance by standard software packages. There is also a general unawareness about these materials, particularly on the reliability of the associated technologies on systems where often the security of supply must always be assured. This COST Action tackles all the above challenges, by a systemic approach that will create the path from materials to devices; foster improved modelling and advanced computation paradigms; provide methodologies and demonstrators for addressing industrial challenges and applications; and develop tools for the economic and sustainability assessment of HTS technologies.

European network for Mediterranean cyclones in weather and climate

CHAIR: Dr Emmanouil Flaounas (GR) em.flaounas@hcmr.gr
FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Cyclones are the main weather modulators in the Mediterranean region and constitute a major environmental risk, often producing windstorms and heavy rainfall. Moreover, cyclones play a key role in the regional climate variability by controlling the oceanic circulation and regional water cycle, and by mobilizing and transporting large amounts of dust from North Africa. Despite the recent achievements of the scientific community to provide deeper insight into the atmospheric processes and impacts associated with Mediterranean cyclones, there are still unaddressed scientific challenges that require a coordinated approach. In addition, the lack of direct interaction between academic researchers and weather/climate prediction scientists working in operational centres inhibits the efficient exploitation of fundamental research results to improve atmospheric models in a tangible way. Therefore, it is undeniable that there are potentially large societal benefits from improving cyclone predictions for weather and climate timescales. Efficient networking between stakeholders, operational weather forecasters and researchers is timely and essential to address both challenges of research coordination and operational implementation of scientific results into weather and climate services. This Action will coordinate the activities of researchers in meteorology and climatology and scientists from weather/climate services with the main aims to provide a deeper understanding of Mediterranean cyclones and to improve significantly the European capacity to predict their environmental and climate impacts. In this context, the network will identify, and involve in the network, relevant stakeholders with different backgrounds (e.g. civil protection, re-insurance companies) and co-develop cyclone prediction products tailored to their needs.

CA19110

Plasma applications for smart and sustainable agriculture

CHAIR: Dr Nevena Puac (RS) nevena@ipb.ac.rs

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

A continuous increase in demand for food caused by population growth represents a serious challenge for the humankind. Even in regions where food is plentiful, safety of the food cycle is increasingly important. Improving sustainability of agriculture and at the same time reducing adverse effects of agriculture on the environment requires efficient technologies that enhance productivity while maintaining food quality and safety. The main aim of this COST Action is to investigate the potential of low temperature plasmas (cold plasmas), as a green alternative to conventional chemicals in agriculture to improve yields, increase size and robustness of plants and to reduce (or eliminate) the need for antifungal agents. It will aim to break the classical field boundaries for new dimension in sustainable agriculture with lower chemical impact. The Action will address the use of plasmas for treating food and packaging. Action aims at combining efforts of numerous European scientific communities dealing with plasma, biology, agriculture and food processing with a goal of identifying and developing applications in the chain of food production. Transfer of plasma technology to industry will be based on understanding of plasma's most important processes with further considerations including (Novel food) legislations, energy consumption, food safety and quality. The Action will help define a new field in science by a coordinated, joint effort across the Europe and broader, through exchange and a better use of resources and by intensive study of the basic mechanisms within the context of the well thought out present or future applications.

https://plagri.eu/

European Network on Future Generation Optical Wireless Communication Technologies

CHAIR: Dr Ali KHALIGHI (FR) Ali.Khalighi@fresnel.fr

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The design of future wireless communication networks that cope with the ever-growing mobile data traffic as well as support varied and sophisticated services and applications in vertical sectors with a low environmental impact is recognized as a major technical challenge that European engineers face today. The COST Action NEWFOCUS will propose truly radical solutions with the potential to impact the design of future wireless networks. Particularly, NEWFOCUS aims to establish optical wireless communications (OWC) as an efficient technology that can satisfy the demanding requirements of backhaul and access network levels in beyond 5G networks. This also includes the use of hybrid links that associate OWC with radiofrequency or wired/fiber-based technologies. Towards this vision, NEWFOCUS will carry out a comprehensive research programme under two major pillars. The first pillar is on the development of OWC-based solutions capable of delivering ubiquitous, ultra-high-speed, low-power consumption, highly secure, and low-cost wireless access in diverse application scenarios. The developed solutions will in particular support Internet-of-Things (IoT) for smart environments with applications in vertical sectors. The second pillar concerns the development of flexible and efficient backhaul/fronthaul OWC links with low latency and compatible with access traffic growth. In addition to scientific and technological advances, NEWFOCUS will serve as a global networking platform through capacity building of all relevant stakeholders including universities, research institutions, major industry players, small medium enterprises, governmental bodies and non-governmental organisations. Within this rich consortium, NEWFOCUS will train experts to accompany related European industries for the standardisation and commercialization of the OWC technology.

https://www.newfocus-cost.eu

CA19112

Women on the Move

CHAIR: Dr Marie-José Ruiz (FR) marie.jose.ruiz@u-picardie.fr
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Women on the Move is a transdisciplinary network of European researchers who focus on historic and contemporary female labour mobility spanning six centuries to the present. The objective is to show the presence and economic contribution of female migrants in European history by revealing women as active migrants and builders of Europe – with economic means, belongings, assets and social networks – capable to overcome gendered obstacles. This will contradict macro-narratives that present women as vulnerable migrants and economic burdens. Focusing on women's labour mobility will raise the current debates on migration by unveiling women's skills and agency, as well as their constraints and limits as economic actors. The Action suggests a multidimensional and multi-factorial interpretation of migration dynamics and tackles in-migration, out-migration and internal migration in a long perspective to highlight consistencies and exceptions in European historic migration patterns. This will bring out local idiosyncrasies and challenge global narratives on female migration. Women on the Move will create a repository of sources on female migration and will dialogue with policy makers. The Action will organize exhibitions (in- and out-door) to reach out to the public on women's presence in European migration history and their contribution to the European economy. In keeping with the European Union's Gender Equality Strategy 2018-2023, the Action will thus challenge gender-blind perceptions of European migration and deconstruct sexist stereotypes. Women on the Move will bring about informed dialogues on European migration, with knowledge on historic and contemporary women's economic potential, labour power, cultural and social belongings, and networking.

https://www.womenonthemove.eu/

CA19113

The European Researchers' Network Working on Second Victims

CHAIR: Prof José Joaquín Mira (SP) jose.mira@umh.es
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Patient Safety is a Priority in Europe. However, unfortunately every year between 8 and 12% of the people admitted to hospitals and around 6% of those in primary care suffer from an adverse event (AE) while receiving healthcare. When an AE does occur, there is a domino effect with healthcare professionals (second victims of these events) also suffering from the knowledge of having harmed their patients (first victims). This second victim phenomenon increases the likelihood of further errors and suboptimal care as consequences of emotional disturbances in the hours after the patient safety event. The overall aim of this Action is to facilitate discussion and share scientific knowledge, perspectives, legislation and rules, and best practices concerning AEs in healthcare institutions to implement joint efforts to support second victims, and to introduce an open dialogue and discussion among stakeholders about the consequences of the second victim phenomenon based on a cross-national collaboration that integrates different disciplines and approaches, including legal, educational, professional, and socio-economic perspectives. This Action will yield innovative solutions through enhancing our understanding of decision-making after patient safety events, ideas for caring for the care provider as a prerequisite for safety and quality of care, promoting debate among stakeholders involved in the understanding of clinical errors and creating new approaches to break the taboo around mistakes, enriching our knowledge of the factors that might contribute to transparency after mistakes, capturing the multi-dimensionality of the second victim phenomenon, and proposing recommendations and interventions useful for the European countries and overseas.

Network for Optimized Astatine labeled Radiopharmaceuticals

CHAIR: Dr Jean-François GESTIN (FR)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Cancer is a major health concerns for European citizens. Thus, the main research aim of this Network for Optimized Astatine labeled Radiopharmaceuticals (NOAR) COST Action is to successfully demonstrate that one of the most promising radionuclides for Targeted Alpha Therapy (TAT), namely astatine-211, can become the European standard for treatment of certain cancerous pathologies. To this end, an efficient networking is essential among all European stakeholders interested in promoting astatine-211 for medical applications. NOAR COST Action brings together European and international excellence labs, astatine-211 production centers, hospitals, industry and patient associations from more than 20 countries, thus covering the whole value chain of innovation: production, chemistry, radiochemistry, biology, preclinical and clinical research and delivery of radiopharmaceuticals to patients. A European web portal will be created containing information for patients, practitioners, researchers, Industry and as a contact point for National and European patient associations. The idea is to gather forces at the European level in order to implement actions to leverage hurdles to the development of this powerful radionuclide and to identify pathologies in which it will be particularly relevant. A special emphasis will be given to train a new generation of young researchers and PhD students, promoting interdisciplinary competences through international and inter-sectoral mobility. The long-term goal of this project is to make Astatine-211 technology available to all European citizens.

CA19115

Network for blood pressure research in children and adolescents

CHAIR: Prof Empar Lurbe (SP) empar.lurbe@uv.es

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Hypertension (HTN) is now responsible for 7.1 million deaths per year worldwide, and largely contributes to cardiovascular and renal diseases such as ischemic heart disease, stroke and chronic kidney disease. Cardiovascular and renal diseases linked to high blood pressure (BP) are the first cause of mortality in Europe with an economic impact cost of approximately 1 billion euros per year. In fact, although most of the adverse outcomes occur in adulthood it has become clear that high BP is a life course problem that can become evident in early life. While few would dispute the importance of taking effective steps to identify and manage this condition in middle-aged and older people, relatively little attention has been paid to the problem of high BP in children and adolescents. As a consequence, despite the latest advances and the wide literature on BP in children and adolescents, the solutions to relevant questions are still pending. Thus, scientific and clinical community, as well as decision-makers, stakeholders and the overall society, must face some critical problems related to the high BP in children and adolescents as a cardiovascular risk factor. The COST Action HyperChildNET is aimed at establishing a European sustainable and multidisciplinary network of internationally renowned researchers, clinicians, early career investigators, health economists, decision-makers, patients, regulatory bodies, nutrition & pharma companies and medical devices manufacturers focusing on acquiring a holistic understanding of the factors affecting high BP in children in order to propose and implement corrective and preventive actions both globally and locally.

Trace metal metabolism in plants

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Many trace metals (TMs) (e.g. Cu, Fe, Mn, Mo, Ni, Zn) are essential for organisms as active centres of enzymes, as about one third of all proteins are metalloproteins. Therefore, TM homeostasis in plants is at the core of many challenges currently facing agriculture and human societies. Low TM bioavailability in many soil types of large world areas causes a reduction in crop production and diminishes nutritional value of food. Some essential TMs (e.g. Cu) have narrow beneficial concentration ranges, while others (e.g. Cd, Hg) are usually only toxic, and in many areas of the world metal toxicity is a severe agricultural and environmental problem. For environmental risk assessment and remediation, as well as improved agriculture (targeted fertilisation and breeding), the mechanisms of TM uptake, distribution, speciation, physiological use, deficiency, toxicity and detoxification need to be better understood. PLANTMETALS aims at elucidating them by the combined expertise of researchers (physiologists, (bio)physicists, (bio)(geo)chemists, molecular geneticists, ecologists, agronomists and soil scientists). It furthermore aims at making this knowledge applicable to the needs of farmers and consumers, with input from companies for translating laboratory results into applied products. This shall be done by integrated scientific, communication and dissemination activities, pooling together our research efforts. Regular meetings within and between the workgroups of this COST network, training workshops for young scientists, as well as by technology transfer meetings will be organised in cooperation with the partner companies within PLANTMETALS, as well as producers and merchants of micronutrient fertilisers.

https://plantmetals.eu/plantmetals-home.html

CA19117

Researcher Mental Health

CHAIR: Dr Gábor Kismihók (DE) gabor.kismihok@tib.eu
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

ReMO will focus on wellbeing and mental health within academia, a theme of strategic importance for the European Research Area. Previous research shows that low levels of wellbeing and mental health problems have a negative impact on individual, team and organizational performance, triggering significant costs. In addition, institutional context, organizational structure and culture, as well as managerial practices have significant impact on wellbeing and health of employees. Therefore, general insights on the causes of workplace wellbeing and mental health need to be refined with contextual specifics (i.e. in academia) in order to develop tailored, effective and efficient prevention and action programs. ReMO wants to address these limitations using a threefold approach: 1) We aim at developing a conceptual framework and tools that are tailored to the academic context taking into account the specifics and challenges of academia and academic work (e.g. performance management of academics, an increasingly competitive landscape for recruiting and retaining talented employees, increasing challenges of dealing with diversity and internationalization, job insecurity, etc.); 2) We take a multilevel perspective on problems and problem generating mechanisms, but also on positive organizational behavior in support of meaningful work and wellbeing; 3) We use a diversity of methods with short feedback loops between theory and practice. The proposers of ReMO are academics, practitioners, policy makers and consultants for higher education institutions. They represent an international mix of scientific knowledge and practice on researcher mental health and a much needed interdisciplinary (e.g. psychology, sociology, business administration), multilevel (individual, organizational, system) and intercultural perspective.

https://projects.tib.eu/remo

High-performance Carbon-based composites with Smart properties for Advanced Sensing Applications

CHAIR: Prof Costas Charitidis (GR)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The goal of EsSENce is to develop an innovation scientific hub at European and International level, focusing on advanced composite materials reinforced with Carbon based (nano)materials (CNMs). The sharing of ideas and results will boost the development of high-performance composites with sensing properties. Special focus will be given in the utilisation of these materials for the introduction of smart properties to the final composites and their application in the field of sensors development. The aim of EsSENce hub, defined as a collaborative community, is to gather together scientific partners, research groups, technology providers and industrial key players aiming to enhance creativity and collaboration among them, by positioning the entrepreneurial individuals at the centre. Indeed, by building a community with diversity both in the broad sense (gender, ethnicity) and with regards to heterogeneous knowledge, the emergence of novel ideas and practices is fostered thus leading to unique and viable innovations. EsSENce activities will focus on the promotion of the successful results from the involved partners and the utilization of the synergistic effect to improve exploitation and dissemination of knowledge. Dissemination and management actions will be organised to attract the interest of research and industry for higher awareness. The intention is to enable as many groups as possible to participate in a highly integrated innovation environment, which will develop Workgroups, will organize Workshops and Conferences, as well as Training Schools and Seminars. EsSENce will promote mobility among researchers, junior scientists and students working on these fields, while promoting contacts with related industries.

http://www.essence-cost.eu/

Investigation on comics and graphic novels in the iberian cultural area

CHAIR: Prof VIVIANE ALARY (FR) Viviane.ALARY@uca.fr
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The iCOn-MICS Action aims at carrying out Investigation on Comics and Graphic Novels from the Iberian Cultural Area (Spain, Portugal, and Latin America). Today, Iberian comics are struggling to position themselves on the global scene particularly because of past political and economic crises and a strong lack of recognition. Moreover, research works are very scattered leading to redundant initiatives and sources are not easily accessible. iCOn-MICS will address it by structuring an international federating network of researchers, professionals, and end-users on Iberian comics to gather research works and improve access to it and to the sources; strengthening its dissemination and preservation; and improving practices for using comics as an educational tool to highlight and improve the image of this medium. To achieve those objectives, the network integrates 11 European countries, including 7 ITCs and 3 countries of Latin America (IPCs). iCOn-MICS will produce various tools devoted to a broad range of stakeholders including: a database gathering Iberian comics, authors, and research works, a professional website dedicated to Iberian comics promotion, and a guide to use comics as an educational tool. This Action will significantly strengthen Iberian comics identity on the international scene. Moreover, comics as a testimony to countries culture and history will provide a new vision of this Iberian area. Finally, iCOn-MICS will offer broader advances in research on new trends and use of comics as an educational tool. Sustainable synergies created between authors, publishers, readers and researchers in this field will represent solid assets for developing research and industry.

https://iconmics.hypotheses.org/

WATer isotopeS in the critical zONe: from groundwater recharge to plant transpiration

CHAIR: Prof Daniele Penna (IT) daniele.penna@unifi.it
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Understanding water exchange within the critical zone, i.e.the dynamic skin of the Earth that extends from vegetation canopy to groundwater, is vital for addressing key environmental problems linked to the sustainable management of water resources. The main aim of WATSON is to collect, integrate, and synthesize current interdisciplinary scientific knowledge on the partitioning and mixing of water in the critical zone taking advantage of the unique tracing capability of water isotopes. These efforts will allow going beyond the current fragmented knowledge providing a novel conceptual framework on the interactions between groundwater recharge, soil water storage, and vegetation transpiration useful for water resources management across a variety of climatic settings. The Action activities are based on a network of early career and senior scientists from different complementary disciplines who are experts in the use of water isotopes, and stakeholders from governmental agencies and private companies from 19 COST countries and one Near Neighbour Country. Meetings and training events will involve scientists and water managers, facilitating communication between academia and stakeholders, promoting the transfer of the latest scientific findings, and helping to identify research gaps and management priorities. The ultimate goal of the network is to build capacity in the use of robust isotope approaches for water resource management. The deliverables include practical tools, such as maps of groundwater recharge and water sources used by vegetation in different European regions that will enable the translation of scientific cutting-edge knowledge into tangible recommendations to support European agencies responsible for water management in agro-forest systems.

CA19121

Network on Privacy-Aware Audio- and Video-Based Applications for Active and Assisted Living

CHAIR: Dr Francisco Florez-Revuelta (SP)
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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Europe faces crucial challenges regarding health and social care due to the demographic change and current economic context. Active and Assisted Living (AAL) are a possible solution to face them. AAL aims at improving health, quality of life, and wellbeing of older, impaired and frail people. AAL systems use different sensors to monitor the environment and its dwellers. Cameras and microphones are being more frequently used for AAL. They allow to monitor an environment and gather information, being the most straightforward and natural ways of describing events, persons, objects, actions, and interactions. Recent advances have given these devices the ability to 'see' and 'hear'. However, their use can be seen as intrusive by some end users (assisted persons, and professional and informal caregivers.) The General Data Protection Regulation (GDPR) establishes the obligation for technologies to meet the principles of data protection by design and data protection by default. Therefore, AAL solutions must consider privacy-by-design methodologies in order to protect the fundamental rights of those being monitored. The aim of GoodBrother is to increase the awareness on the ethical, legal, and privacy issues associated to audio- and video-based monitoring and to propose privacy-aware working solutions for assisted living, by creating an interdisciplinary community of researchers and industrial partners from different fields (computing, engineering, healthcare, law, sociology) and other stakeholders (users, policy makers, public services), stimulating new research and innovation. GoodBrother will offset the "Big Brother" sense of continuous monitoring by increasing user acceptance, exploiting these new solutions, and improving market reach.

https://goodbrother.eu/

CA19122

European Network For Gender Balance in Informatics

CHAIR: Prof Maria Letizia Jaccheri (NO)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Women are underrepresented in Informatics (Computer Science, Computer Engineering, Computing, ICT) at all levels, from undergraduate and graduate studies to participation and leadership in academia and industry. Increasing female representation in the field is a grand challenge for academics, policymakers, and society as a whole. Although the problem is evident, progress has been invariably slow, in spite of all the momentum and impulse for change happening across Europe. The main aim of this COST Action is to improve gender balance in Informatics through the creation and strengthening of a truly multi-cultural European network of academics working on the forefront of the efforts in their countries, institutions and research communities. We will be building on their knowledge, experiences, struggles, successes, and failures, learning and sharing what has worked and how it could be transferred to other institutions and countries. Among other outcomes, the Action will provide the academic community, policymakers, industry and other stakeholders with recommendations and guidelines to address the following key challenges: i) How to have more girls choosing Informatics as their higher education studies and profession; ii) How to retain female students and assure they finish their studies and start successful careers in the field; iii) How to encourage more female Ph.D. and postdoctoral researchers to remain in the academic career and apply for professorships in Informatics departments; iv) How to support and inspire young women in their careers and help them to overcome the main hurdles that prevent women to reach senior positions.

https://eugain.eu

Protection, Resilience, Rehabilitation of damaged environment

CHAIR: Dr Andrea Pietrelli (FR) andrea.pietrelli@univ-lyon2.fr
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Humanity faces unprecedented challenges: global warming, overuse of fossil fuel energy and increasing urbanisation. While solutions are becoming increasingly limited, microorganisms represent a realistic hope. For millennia microbes have tirelessly been shaping the Earth's ecosystems and with the right approach, they can be help re-introduce environmental equilibrium. PHOENIX aims to demonstrate the effectiveness of Bio-electrochemical systems (BESs); BESs exploit the biological activity of live organisms for pollutants reduction, recycling of useful elements, synthesis of new products and production of electricity, in the case of microbial fuel cell (MFC). Recent advancements in the field of low power electronics enables the exploitation of these environmental technologies. Activities will be related to the characterization of BESs technologies and their implementation as bio-remediator, bio-sensing, bio-reactor in link with sustainable urban planning and sociology-economic aspect. The integration of bio-technologies in the urban context is a key priority for correct urban planning and minimum environmental impact.

Rethinking packaging for circular and sustainable food supply chains of the future

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Food packaging is designed to protect the food through its supply chain, communicate to customers, and to ensure food quality, safety and optimal shelf life. Progress is now needed to secure its circularity, minimize food waste and improve sustainability. CIRCUL-A-BILITY will go beyond the state of the art by jointly addressing the major technical and non technical hurdles for implementation of sustainable food packaging solutions within future circular food supply chains. A food specific, focused action is critical amongst the ongoing debate in sustainable packaging. It is important to share data on the consequences of specific food product – package interactions and to keep the behavior of consumers as a critical focus. CIRCUL-A-BILITY will organize a pan-European network of actors involved in all aspects of food packaging, including material scientists, food scientists, industry end-users, consumer scientists and policy makers. The network will actively work to harmonise and integrate food packaging related research, share information, support industry in the implementation of sustainable packaging systems, create authoritative working groups able to give science based recommendation to consumers, user groups, policy makers and industry. It is expected that such COST action activities will 1) valorize the current technical advances, 2) speed the preparation of prototypes beyond the interest of single stakeholders and to the benefit of the European landscape; 3) avoid duplication of efforts in research in adjacent fields; 4) accelerate technology transfer and entrepreneurship; 5) elevate the scientific capacity and research ranking of the COST working members.

EPIgenetic mechanisms of Crop Adaptation To Climate cHange

CHAIR: Prof Federico Martinelli (IT) federico.martinelli@unifi.it
FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The ultimate objective of this proposed COST action is to define, develop, generate and share new breaking knowledge and methodology for the investigation of epigenetic mechanisms modulating plant adaptation to environmental stresses driven by climate change. No international network has been still created with the aim of standardizing methodology in plant epigenetics/epigenomics and better integrate these data with other "omic" approaches. EPI-CATCH will create a pan-European framework for networking in this under-investigated research field. This COST Action will use a unique cross-disciplinary approach that brings together industrial developers, molecular geneticists, molecular biologists, crop breeders, agronomists, plant pathologists, bioinformaticians. EPI-CATCH will expand new frontiers on both innovative and translational research targeting the new challenges in plant epigenetics. Four main specific objectives will be addressed by four provided working groups (WG): 1) update of the most-recent findings in crop epigenomics related to climate change, 2) development of new concepts and approaches in crop epigenetics and epigenomics that can be transferable in other living organisms, 3) establishment of common standardized pipelines, methods and workflows for generation, analysis and interpretation of epigenetic/epigenomic data, 4) an intense output dissemination and training for early-career scientists. The methodologies, concepts and ideas developed by EPI-CATCH will assist stakeholders to develop future innovative technologies to enhance environmental sustainability of agriculture in a rapid climate change scenario.

Positive Energy Districts European Network

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Europe is set to be a global role model in energy transition. It has made significant progress in building level innovations and is now stepping up efforts towards city-wide transformation with the pioneering concept of Positive Energy Districts (PEDs). The EU's Strategic Energy Technology Plan (SET-Plan) has set out a vision to create 100 PEDs in Europe by 2025. The concept of PEDs is emerging and the knowledge and skills needed for the planning and designing, implementation and monitoring, as well as replication and mainstreaming of PEDs are yet to be advanced. The challenge is cross sectors and domains, thus the solutions can only be found through collective innovation. This COST Action will drive the deployment of PEDs by harmonizing, sharing and disseminating knowledge and breakthroughs on PEDs across different stakeholders, domains and sectors at the national and European level. It will establish a PED innovation eco-system to facilitate open sharing of knowledge, exchange of ideas, pooling of resources, experimentation of new methods and co-creation of novel solutions across Europe. Additionally, this COST Action will support the capacity building of new generation PED professionals, Early Career Investigators as well as experienced practitioners. It will mobilize the relevant actors from and across Europe to collectively contribute to the long-term climate neutral goal.

Cognitive decline in Nephro-Neurology: European Cooperative Target

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Fragmentation between neurological and nephrological expertise has frustrated research into the mechanism of cognitive decline secondary to kidney disease. By for the first time bringing these fields together in CONNECT we establish a novel multidisciplinary field to improve patient diagnosis and care. The developed world is experiencing a growing number of patients with chronic kidney disease (CKD), a complex systemic and potentially fatal disease. With improved long-term life expectancy as the result of kidney replacement therapies, more attention has been given to comorbidities, including cognitive impairment. In CKD patients, both the central and peripheral nervous system are frequently affected. Eventually, this decreases quality of life and eventually dementia with loss of independence in everyday activities. CONNECT aims to coordinate research on cognitive impairment in CKD. This requires exchanging clinical information between nephrologists and neurologists, and between neuroscientists and kidney physiologists, guided by big data analysts. This collaborative network will define new experimental paradigms, their translational value and, in turn, focus on new interventions in the field of cognitive impairment. At the core of this COST Action lie activities that bridge the gaps between these fields and prepare early-stage researchers and clinicians to start new research lines. The interdisciplinary consortium from 22 countries will focus on 1) Pre-clinical research, 2) Clinical trials, 3) clinical practice, 4) Data management and analytics, and 5) Inclusiveness and dissemination of the Action. This COST Action will alleviate disparities in CKD patient care and enable breakthrough research enabling patient diagnosis and early treatments.

http://www.connectcost.eu

CA19128

Pan-European Network for Climate Adaptive Forest Restoration and Reforestation

CHAIR: Prof Vladan Ivetic (RS) vladan.ivetic@sfb.bg.ac.rs

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The capacity of forests to mitigate climate change is underutilized. More than two billion hectares of degraded areas worldwide need restoration; in many countries timely reforestation following harvests, disturbances, and land abandonment is lagging; and forest management could be sustainably intensified to sequester more carbon. Increasingly, global change and human-induced disturbances raise the need for accelerating restoration and reforestation programs, although consensus is lacking on which techniques to use and what objectives to pursue. Indeed, a confusing terminology and multiple, often conflicting interests fuel the debate on what constitutes success and appropriate forest management objectives. Additionally, knowledge gained locally is not widely shared and vice versa. Thus there is an urgent need to broaden the experience on climate adaptive forest restoration and reforestation (CAFoRR). Underlying these urgent need, the developing bioeconomy will sharply increase the demand for forest products. The PEN-CAFoRR network of experts from Europe and beyond will respond to these challenges by addressing the entire cycle of forest restoration and reforestation in different ecosystems, by broadening the dissemination of knowledge, and by facilitating an increased scale of planning and implementation of CAFoRR programs. Specifically, PEN-CAFoRR will provide new guidelines for 1) setting restoration and reforestation goals, 2) decision making on need and ways of restoration, 3) selection, 4) production and quality control of targeted forest reproductive material, 5) establishment techniques, and 6) post-planting protection and silviculture. One result will be an open-access database comprising state-of-the-art information on techniques and guidelines of European CAFoRR.

http://www.pen-caforr.org/

Decolonising Development: Research, Teaching and Practice

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Action DecolDEV takes on the challenge to reconstruct the concept and practice of development after its deconstruction. It aims for a resetting and diversification of the actors, structures, institutions and spaces in which knowledge about and for development is produced, shared, contested and put into practice. The Action will progress beyond the state-of-the-art through exploring and formulating alternatives in three areas: Research, Teaching and Practice.

CA19130

Fintech and Artificial Intelligence in Finance – Towards a transparent financial industry

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FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The financial sector is the largest user of digital technologies and a major driver in the digital transformation of the economy. Financial technology (FinTech) is aims to compete with traditional financial industry methods in the delivery of financial services. Globally, more than $100 billion of venture capital and growth equity has been deployed to Fintech companies and Artificial Intelligence (AI) since 2010, still growing substantially. In early 2018, the European Commission unveiled their action plan for a more competitive and innovative financial market, and initiative on AI with the aim to harness the opportunities presented by technology-enabled innovation in financial services. Europe should become a global hub for FinTech, with EU businesses and investors able to take most of the advantages offered by the Single Market in this fastmoving sector. We want to facilitate interactions and collaborations between different groups of academics and industry working on Fintech and AI in Finance, to provide theoretic expertise to industrial partners, and to establish a large and vibrant interconnected community of excellent scientists across diverse fields. The key objectives are:

- to improve transparency of AI supported processes by developing a data-driven rating methodology for ICOs;
- to address the disparity between the proliferation in AI models within the financial industry for risk assessment and decision-making, and the limited insight the public has in its consequences by developing policy papers and methods to increase transparency;
- to develop methods to scrutinize the quality of rule-based "smart beta" products across the asset management, banking and insurance industry.

https://fin-ai.eu/

CA19131

Europe Through Textiles: Network for an integrated and interdisciplinary Humanities

CHAIR: Dr Agata Ulanowska (PL) a.ulanowska@uw.edu.pl

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

EuroWeb fosters a pan-European network of scholars and stakeholders from academia, museums, conservation, cultural and creative industries. Scholars from 13+ disciplines of the Humanities (philology, art history, archaeology, history), Social Sciences (social anthropology, ethnology, economics, law) and Natural Sciences (geochemistry, conservation, chemistry, biology) join forces to bridge current cultural, political and geographical gaps and facilitate interdisciplinary research leading to inspirational material for experts in the allied and applied disciplines of fashion, art and design. The scholarly vision is to re-write European history based on its massive production, trade, consumption and reuse of textiles and dress. The goal is to identify expertise across time in sustainable textile practices. For this purpose, ITCs are crucial for their experience in ancient techniques and cultural heritage in textile craft. EuroWeb consists of 100+ proposers from 24 COST member countries, incl. 15 ITCs. It offers multiple theoretical and practical training schools, mentors, targeted career development masterclasses for the ECIs, with the aim to increase EU funding for ITC scholars and ECIs. Each year, EuroWeb aims to host large international textile and dress conferences in the ITCs, to highlight their collections, capacities and scholarship. EuroWeb enables collaborations between researchers, engineers, scholars and other stakeholders and business by providing a platform for them to collaborate, co-create projects and training schools, and foster trust and shared ideas. Deliverables include collaborative publications, research workshops, theoretical reflection and advancement, digital infrastructure, EuroWeb digital Atlas, films and podcasts, and intense mentoring, training and career development for ECIs.

CA19132

European Network to Advance Best practices & technoLogy on medication adherencE

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Due to an ageing society, there is a steady increase in chronic diseases and multi-morbidity in the EU. This rise of chronic diseases and multi-morbidity requires a multidisciplinary response, which often involves lifestyle changes combined with lifetime medication use. Medication non-adherence affects however up to half of the chronic medication users, poses considerable challenges in managing chronic diseases, and is associated with almost 200,000 deaths and € 80-125 billion of potentially preventable direct and indirect costs in the EU. Technological advances (e.g. smart pillboxes, digital inhalers, tracking devices, e-injection pens, e-Health, big data), have significant potential to support healthcare professionals and empower patients in detecting and managing non-adherence. Awareness of healthcare professionals on the availability and implementation of adherence enhancing technology is limited and there is a lack of collaboration between stakeholders. Successful EU-wide implementation of adherence enhancing technology is further hampered by a lack of insight in different European healthcare systems, reimbursement pathways and policy regulations that significantly differ between countries. This affects not only patients and healthcare professionals, but also manufacturers of technology (mostly SMEs) in their innovation capacity and competitiveness. To address these challenges, the European Network to Advance Best practices & technoLogy on medication adherencE (ENABLE) aims to 1) raise awareness of adherence enhancing technological solutions, 2) foster and extend multidisciplinary knowledge on medication adherence at patient, treatment and system levels, 3) accelerate translation of this knowledge to useful clinical application and 4) work collaboratively towards economically viable implementation of adherence enhancing technology across European healthcare systems.

Fostering and Strengthening Approaches to Reducing Coercion in European Mental Health Services

CHAIR: Prof Richard Whittington (NO)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

FOSTREN is an Action designed to establish a sustainable, multi-disciplinary network of researchers and practitioners focused on reducing the degree to which mental health services use coercion in hospital and community mental health services. Many people receiving mental health care are subjected to coercive practices such as outpatient commitment in the community and physical restraint in hospital. Such practices can violate human rights and there is a growing international policy momentum to reduce reliance on them. Given the biopsychosocial complexity of mental health service delivery, successful initiatives in this area require sustained multilevel interventions which can be implemented effectively in the long term. Clinical practice in this area is extremely variable across Europe and relevant research activity is highly fragmented. The FOSTREN network will address these issues by enabling research and practice expertise to be exchanged in order to create an integrated framework for mental health service transformation. The network objectives are: to advance understanding of successful interventions to reduce coercion within an implementation science paradigm by building a stable interdisciplinary network of European researchers and practitioners; and to apply this understanding by articulating and communicating best practice to key stakeholders responsible for mental health service delivery. This will be achieved through networking activities organized along four themes: risk factors; alternative interventions; outcomes & recovery; and implementation science. Key deliverables such as a framework for shared datasets and a coercion reduction implementation model will contribute to a pan-European effort to enhance human rights for vulnerable people with mental health problems.

Distributed Knowledge Graphs

CHAIR: Dr Tobias Käfer (DE) tobias.kaefer@kit.edu

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Knowledge Graphs are a flexible way to represent interlinked information about virtually anything. People from a variety of application domains including biomedical research, public and open data, linguistics, journalism, and manufacturing publish, use, and investigate knowledge graphs. As the publication is done in a decentralised fashion across the web, the knowledge graphs form a distributed system. Due to the ever-increasing uptake of Knowledge Graph technologies in recent years, there are new challenges for research and development including dealing with the scale and the degree of distribution of knowledge graphs, while monitoring and maintaining data quality and privacy. Tackling these research challenges will need a stronger collaboration within the research community, and a joint effort to establish a more functional, decentralized Web of Data. The main aim of the Action is therefore to create a research community for deployable Distributed Knowledge Graph technologies that are standards-based, and open, embrace the FAIR principles, allow for access control and privacy protection, and enable the decentralised publishing of high quality data. To this end, the Action connects European researchers and practitioners from: 1) diverse application domains and 2) the whole life cycle of Distributed Knowledge Graphs, from provisioning to finding, accessing, integrating, programming, deploying, enriching, and analytics. The Action will develop practices for scalable, privacy-respecting, high quality and decentralised Knowledge Graph publication and consumption, reach out to the European industry, and formulate a research agenda.

CA19135

Connecting Education and Research Communities for an Innovative Resource Aware Society

CHAIR: Dr Gordana Rakic (RS) goca@dmi.uns.ac.rs

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

Parallel computing platforms have revolutionised the hardware landscape by providing high-performance, low-energy, and specialized (viz. heterogeneous) processing capabilities to a variety of application domains, including mobile, embedded, data-centre and high-performance computing. However, to leverage their potential, system designers must strike a difficult balance in the apportionment of resources to the application components, striving to avoid under- or over-provisions against worst-case utilisation profiles. The entanglement of hardware components in the emerging platforms and the complex behaviour of parallel applications raise conflicting resource requirements, more so in smart, (self-)adaptive and autonomous systems. This scenario presents the hard challenge of understanding and controlling, statically and dynamically, the trade-offs in the usage of system resources, (time, space, energy, and data), also from the perspective of the development and maintenance efforts. Making resource-usage trade-offs at specification, design, implementation, and run time requires profound awareness of the local and global impact caused by parallel threads of applications on individual resources. Such awareness is crucial for academic researchers and industrial practitioners across all European and COST member countries, and, therefore, a strategic priority. Reaching this goal requires acting at two levels: 1) networking otherwise fragmented research efforts towards more holistic views of the problem and the solution; 2) leveraging appropriate educational and technology assets to improve the understanding and management of resources by the academia and industry of underperforming economies, in order to promote cooperation inside Europe and achieve economical and societal benefits.

https://www.cerciras.org/

CA19136

International Interdisciplinary Network on Smart Healthy Age-friendly Environments

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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

To promote social inclusion, independent living and active and healthy ageing in society, the main aim of NET4AGE-FRIENDLY is to establish an international and interdisciplinary network of researchers from all sectors to foster awareness, and to support the creation and implementation of smart, healthy indoor and outdoor environments for present and future generations. NET4AGE-FRIENDLY further aims to overcome fragmentation and critical gaps at both conceptual and pragmatic innovation level on responsive, age-friendly and sustainable environments in order to address the research-policy future requirements of Europe. The main approach of NET4AGE-FRIENDLY is the establishment of new local or regional ecosystems or by expanding existing ones in each European COST country involved, to work on health and wellbeing in an age-friendly digital world. The ecosystems will consist of citizens, public authorities, businesses/NGOs and research and will be supported by five thematic Working Groups (User-centred inclusive design in age-friendly environments and communities, Integrated health and wellbeing pathways, Digital solutions and large-scale sustainable implementation, Policy development and funding forecast, and Cost-benefit evaluation and market opportunities). The outcomes of the five thematic Working Groups will be obtained in the work of one dedicated Working Group to create a synergised output as Reference Framework. NET4AGE-FRIENDLY will be used as a connector for involving and hosting regular themed sessions with local and regional stakeholders and users' representatives from various countries and backgrounds and for fostering the knowledge among researchers and to promote the involvement of Early Career Investigators, Inclusiveness Target Countries and entrepreneurs.

https://www.net4age.eu/

Sudden cardiac arrest prediction and resuscitation network: Improving the quality of care

CHAIR: Dr Hanno L Tan (NL) h.l.tan@amsterdamumc.nl

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Sudden cardiac arrest (SCA) causes 2 million deaths each year in Europe alone. Since SCA strikes unexpectedly and is lethal within minutes if untreated, solving this problem requires 1) recognizing individuals at risk and designing preventive strategies, 2) providing timely and effective treatment. Because SCA mostly occurs out-of-hospital, SCA victims rely on first-response treatment provided by citizens, firefighters and emergency medical services. There are large regional differences in SCA survival rates across Europe (1-30%). This suggests that regional differences in individual risk prediction, prevention and treatment have a major impact on the chance to survive. To improve survival rates across Europe it is imperative to study: 1) inherited, acquired, and environmental risk factors of SCA across European regions; 2) regional differences in preventive measures and first-response treatment strategies and their effectiveness. The PARQ Action will facilitate this research by forming a pan-European network of excellence in SCA and resuscitation science. This network includes investigators from different disciplines including cardiology, molecular biology, resuscitation science, emergency medicine, general practice and health economics. The main objectives of the project are to promote development of standards for collection of clinical data and biological samples and to harmonize data analysis. This will aid in development of risk prediction models based on inherited, acquired and environmental risks. The PARQ action will focus on European differences in first-response treatment and develop guidelines. In summary, the PARQ Action investigators will enable breakthrough developments to decrease the incidence of SCA and improve survival, while reducing the vast regional European differences in survival rates.

Lobular Breast Cancer: Discovery Science, Translational Goals, Clinical Impact

CHAIR: Prof Patrick Derksen (NL) pderksen@umcutrecht.nl

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Invasive Lobular Breast cancer (ILC) represents a major cancer type that affects 25,000 patients annually in Europe, representing a severe societal impact. Differential diagnosis is still unreliable due to variable histological criteria, long-term survival is poor in the metastatic setting and the response to chemotherapy is virtually absent. Despite its etiological, pathological, molecular and clinical peculiarities, there is still no specific treatment strategy for ILC patients, which is mostly due to the lack of concerted multidisciplinary efforts. LOBSTERPOT aims to better understand, diagnose and treat ILC. This Action will combine the essential areas of expertise and provide a comprehensive platform to bring together and foster collaborations between epidemiologists, geneticists, biologists, clinicians, data scientists, academic and industry trialists, ethical and legal experts, as well as ILC patient advocacy movements. This Action will bridge the gaps in translational cancer research for ILC, and will provide an unprecedented clinical impact due to the streamlining of the "from bench-to-bedside" principal to enable uniform diagnosis and tailored treatment for ILC patients. To achieve its aims and in agreement with the mission and vision of the COST Actions, LOBSTERPOT will: 1) coordinate EU-wide multidisciplinary ILC research,2) promote capacity-building by developing a unique biobank, state-of-the-art models, exclusive platforms of multi-OMICs and clinical ILC data accessible to the scientific community, 3) advice policy-makers and other key stakeholders,4) provide an attractive structure for the development of ILC-focused clinical trials, and, 5) create a unique training and networking opportunity for young and senior researchers devoted to fight ILC.

CA19139

Process-based models for climate impact attribution across sectors

CHAIR: Dr Christopher Reyer (DE) reyer@pik-potsdam.de

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Many complex process-based models are available in Europe to project future climate impacts. Yet, the current climate impact research community is fragmented, modeling mostly individual systems. The integration of climate impacts across different natural and societal sectors is only slowly emerging. Likewise, attribution of impacts to climate and other factors is still a strongly under-researched field given that climate change is already strongly manifesting itself, an increasing number of court cases dealing with climate impacts is being negotiated and policy debates on loss and damage are intensifying. This lack of coordination amongst impact modelers and insufficient awareness about impact attribution methods hampers important scientific and political progress and more coordination and networking is urgently needed. Therefore, PROCLIAS aims to develop common protocols, harmonized datasets and a joint understanding of how to conduct cross-sectoral, multi-model climate impact studies at regional and global scales allowing for attribution of impacts of recent climatic changes and robust projections of future climate impacts. The Action will do so by focusing on key interactions of climate impacts across sectors, their accumulated effect, especially of extreme events, the attribution of impacts to climate change and the quantification of uncertainties. PROCLIAS will make use of all COST networking tools to train young researchers to conduct and analyse multi-model simulations in a cross-sectoral way, to support a common platform for collecting impact model simulations and methods for analyzing them and to disseminate the data, code and results to scientists as well as, in a more synthesized form, to stakeholders.

Focused Ion Technology for Nanomaterials

CHAIR: Dr Gregor Hlawacek (DE) g.hlawacek@hzdr.de

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The aim of the Action is to create a coordinated effort in the field of ion beam based nanoengineering that will put European researchers and commercial businesses at the forefront of the quickly moving field of functional nanostructured materials. The Action will unite developers and practitioners of focused ion beam technology to enable them to build the most efficient tool sets and application techniques for the identification, fabrication and characterization of next generation functional nanomaterials. The Action will develop ion sources and instrumentation for the sub 10 nm fabrication and materials analysis. These objectives will be reached through Europe wide networking between researchers from theoretical and experimental groups traditionally not interacting closely. The challenge to overcome is the increasing fragmentation of the FIB landscape between operators of established technologies, developers providing new techniques and methods and designers of functional nanomaterials not aware of the possibilities provided by these emerging focused ion beam technology and methods. A tight feedback loop between academic and commercial technology developers with researchers of fundamental ion solid interactions and scientists developing new functional nanomaterials will be formed through a series of conferences, training schools and short term scientific missions. This will enable European researchers to develop bleeding edge functional nanomaterials allowing them to offer solutions to many of the important socioeconomic questions defined by the various research programs in Europe. New and emerging focused ion beam technology developed by the Action will play an important role for Quantum Technologies, Semiconductor Industry, Functional Nanomaterials and Medical applications.

Integrating Neandertal Legacy: From Past to Present

CHAIR: Prof Ivor Janković (HR) ivor.jankovic@inantro.hr

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Neandertals are the first human population that can be truly recognized as pan-European phenomenon. Traces of their cultural and/or skeletal remains can be found in most European countries and cover a period of more than 250,000 years. A lot of scientific work has been done on various aspects of their heritage and there is a vast collection of archaeological and anthropological data available. However, there is still a discrepancy in available and updated datasets from various countries. In addition, communication between scientists from various fields and from various countries is still based on personal connections between individual scientists, mostly related to specific projects. This Action is a long overdue attempt to bridge the geographic, language, disciplinary-and-data specific gap, as well as a gap created by traditions of different disciplines in different European countries. Through a combined, scientifically-based and geographically inclusive approach, creation of a growing inclusive database, and promoting dialogue among scientists and creating guidelines for research, a solid base for better understanding of Neandertals can be reached. Further, this will allow a base for inclusion of Neandertal legacy into the present, through scientifically based guidelines for public presentation and further actions for promoting their heritage via inclusion of non-scientific stakeholders, such as administrators, museum and cultural workers, touristic sector, small and medium enterprises and other interested parties.

http://inealcost.inantro.hr/

CA19142

Leading Platform for European Citizens, Industries, Academia and Policymakers in Media Accessibility

CHAIR: Dr Pilar Orero (SP) pilar.orero@uab.cat

FUNDING PERIOD: October 2020 – October 2024

SUMMARY

The proposed LEAD-ME COST Action aims to help all stakeholders in the field of Media Accessibility and cross-cutting topics (e.g. AI and Interactive Technologies) in Europe to meet the legal milestones requested by the recently passed European legislation. Researchers, engineers, scholars as well as businesses and policy makers will be empowered by LEAD-ME with a common and unique platform which, during the next 48 months, will collect, create, share, and disseminate innovative technologies and solutions, best practices and guidelines, and promote them. Furthermore, it will contribute towards existing and new standards on Media Accessibility among at least 28 European or associated countries. To do so, the LEAD-ME network will make use of the specific tools of the COST Action: meetings and working group meetings; educational institutes, short-term scientific mission; dissemination activities. LEAD-ME will boost a cultural change and the creation of a new mindset when designing tools for professional and private activities for all European citizens of all abilities and disabilities. This COST Action is strongly needed to avoid further fragmentation in the European accessibility scene, challenging the European Single Digital Market idea. The uneven take-up in Europe is the direct result of the complex nature of Media, the background technology involved, the fast-changing technology and business models, and the wealth of EU languages. This counts for both the market and research.

https://lead-me-cost.eu/

CA19143

Global Digital Human Rights Network

CHAIR: Dr Mart Susi (EE) mart.susi@tlu.ee

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

The Network will systematically explore the theoretical and practical challenges posed by the online context to the protection of human rights. The Network will address the matter whether international human rights law is sufficiently detailed to enable governments and private online companies to understand their respective obligations vis-à-vis human rights protection online. It will evaluate how national governments have responded to the task of providing a regulatory framework for online companies and how these companies have transposed the obligation to protect human rights and combat hate speech online into their community standards. The matters of transparency and accountability will be explored, through the lens of corporate social responsibility. The Network will propose a comprehensive system of human rights protection online, in the form of recommendations of the content assessment obligation by online companies, directed to the companies themselves, European and international policy organs, governments and the general public. The Action will develop a model which minimises the risk of arbitrary assessment of online content and instead solidifies standards which are used during content assessment; and maximises the transparency of the outcome. The Action will achieve scientific breakthroughs a) by means of a quantitative and qualitative assessment of whether private Internet companies' provide comparable protection of human rights online in comparison with judicial institutions, and b) in the form of a novel holistic theoretical approach to the potential role of artificial intelligence in protecting human rights online, and c) by providing policy suggestions for private balancing of fundamental rights online.

https://gdhrnet.eu/

European Venom Network

CHAIR: Dr Maria Vittoria Modica (IT)
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FUNDING PERIOD: October 2020 – October 2024

SUMMARY

Venomous organisms produce complex mixtures of bioactive compounds that have evolved through million years of natural selection in evolutionary arms races. As such, they are extremely efficient, being usually effective at a very low concentration via highly specific interactions with key molecular targets (ion channels, enzymes and membrane components), identifying them as ideal candidates for therapeutic and biotechnological development. Venom research is an emerging and highly multidisciplinary field that involves studies of the biodiversity, ecology and evolution of venomous organisms, the structure and function of venom deployment systems, the biochemistry and pharmacology of venoms, the pathophysiological effects that venom induces in prey and predators, and the translational development of venom components for biomedical and biotechnological applications. These different research facets tend to be pursued by different research groups that usually are poorly coordinated in Europe, hampering a full development of venom investigation and applications. The overarching aim of the EVEN COST Action is to foster venom investigation at the European level. The Action will identify priority targets and promising innovative approaches, develop best practice pipelines ensuring consistency across Europe and providing international standards in venom research. Further, it provides a novel platform to promote synergistic interactions between academia, industry and society, and to nurture a new generation of venom researchers with a multidisciplinary expertise. Building a gender, age and geographically balanced network involving all the relevant stakeholders will be the fundamental prerequisite to leverage the extraordinary biochemical warfare enclosed in animal venoms, with an enduring scientific, technological and socioeconomic impact.

European Network for assuring food integrity using non-destructive spectral sensors

CHAIR: Prof Dolores PEREZ-MARIN (SP) dcperez@uco.es

FUNDING PERIOD: September 2020 – September 2024

SUMMARY

There is an increasing need for the food industry to provide information on their products in order to satisfy quality standards and to protect their products from food fraud. Recent developments in technology, and advances in big data analytics, provide the opportunity for step-changes that can transform the role of food integrity assurance from one of just strictly conformance to one that addresses a wide range of business critical concerns, including quality, safety and authenticity solutions. Non-destructive Spectroscopic Sensors (NDSS), such as NIR Spectroscopy, Fluorescence, Raman or Hyperspectral imaging, enable rapid, non-destructive and environmentally-safe assessment of multiple parameters in a variety of food products. Most applications of these technologies in the food industry are made at-line. Industry requires them to be deployed in situ and preferably on-line for full process control over the entire food chain. These requirements introduce constraints on sensor design and calibration development which do not normally apply to laboratory-based instruments. Long-term stability of instruments, robustness of the calibrations, sensor integration in production environments, transferability of data and the building of real-time decision-making systems are critical issues to be considered. SensorFINT will create a vibrant network, combining experience in research, manufacture, training and technology transfer in relation to NDSS. The Action will operate by developing generic solutions to existing and emerging problems in non-invasive food process control building an "smart food control system" as well as developing a cadre of well-trained young researchers who will convert scientific results into a reality that matches industrial needs.

https://www.sensorfint.eu/

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(and finishing in 2023)

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CA18136					■	■	146
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COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
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COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
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SOURDOugh biotechnology network towards novel, healthier and sustainable food and bloproCesseS

CHAIR: Dr João Rocha (PT) jmfrocha@fc.up.pt

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Traditional sourdough bread resorts to spontaneous fermentations leading to the natural selection of micro-organisms, mainly yeasts and lactic acid bacteria. Such micro-organisms are fundamentally beneficial to humans and, concomitantly, inhibit propagation of undesirable microbiota. Sourdough fermentation was probably one of the first microbial processes employed by human beings for food production and preservation. Sourdough bread is still manufactured widely at farm level across Europe and worldwide and is highly appreciated by consumers for its distinct flavour, texture and healthy attributes. Through a bottom-up approach, this COST Action network brings together a multidisciplinary group of scientists and small and medium-sized enterprises (SMEs)/large enterprises (LEs) dedicated for many decades to studying cereals and sourdough technologies. SOURDOMICS will exploit sourdough technology through the entire value chain: from sustainable cereals, production, fermentation processes, exploitation, by-products and valorisation in the circular economy. Upstream, it aims to exploit autochthonous (pseudo)cereals with good baking, nutritional and healthy attributes, while promoting sustainable agriculture and preserving genetic diversity. Simultaneously, the Action aims to contribute to the development of new business opportunities for local farmers through their engagement in food processing, with shared small-scale bread-making facilities and integration in industrial and trade chains. Such features are in agreement with the European Agenda for Food and Environment. Downstream, the exploitation of biotechnological sourdough fermentation has several objectives: design starter cultures with a wide range of biotechnological applications; production of healthy and tasty varieties of bread, thereby catalysing changes in consumer behaviour; diets and market orientations; production of high-added value metabolites resorting to sourdough microbiota; and the valorisation of by-products from cereal production and sourdough technologies.

https://sourdomics.com/

The European Aquatic Animal Tracking Network

CHAIR: Dr Jan Reubens (BE) jan.reubens@vliz.be

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Telemetry is a method commonly applied to investigate the ecology and movement behaviour of aquatic species in relation to their environment. It provides a scientific basis for management and conservation and has significantly improved our understanding of ecosystem functioning and dynamics. More specifically, telemetry provides valuable data that can be used in many policies and directives. As a result, large-scale nationally and regionally managed initiatives have been implemented around the globe in recent years. Although a large and growing number of researchers in Europe are using biotelemetry to study aquatic animals and answer management-related questions, there is a significant lack of collaboration in infield telemetry in Europe. This situation represents a substantial loss of opportunities for scientific excellence, funding opportunities, and competitivity of European SMEs in the international biotelemetry market. With this COST Action, we want to close this gap, the overarching objective being to ensure a transition from a loosely coordinated set of existing regional telemetry initiatives to a sustainable, efficient and integrated pan-European biotelemetry network embedded in the international context of pre-existing initiatives. This will be achieved through working group meetings, workshops, training courses and scientific missions focusing on: 1) implementing a centralised European database, requirements and policy mapping to the data standards of existing international biotelemetry data systems; 2) improving the usefulness and interapplicability of currently available technology and fostering technological advancements; 3) promoting the establishment of key telemetry infrastructure and research on key species; and 4) providing continuous training opportunities and disseminating knowledge to the stakeholders' community.

http://europeantrackingnetwork.org/cost

Innovation with Glycans: new frontiers from synthesis to new biological targets

CHAIR: Prof Luigi Lay (IT) luigi.lay@unimi.it

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The aim of the INNOGLY COST Action is to build up a multidisciplinary group of researchers to address the same pioneering goal: gaining new insight into the biological function of glycans in different biological contexts. INNOGLY will address two main topics: 1) glycan profiling in health and disease, where studies will be more specifically focused on glycan-based correlations in developmental and cancer biology, and glycan-dependent modulation of autophagy in cancer, lysosomal disorders and neurodegenerative diseases; 2) glycan-based diagnostics and therapeutics, whereby INNOGLY investigators will focus on the glycan-dependent fine-tuning of immunity, and exploration of the multifaceted roles of glycosaminoglycans. Within these topics, INNOGLY will foster the development of new glycan-based tools for the diagnosis and treatment of diseases. To this end, it will bring together scientists working in the vast area of glycoscience and researchers in other scientific disciplines willing to participate in the mutual exchange of knowledge, skill and expertise. In this way, scientists who have never been involved in glycoscience can provide improvements and new tips by sharing their different points of view. The goal is to foster and forge collaborations among researchers, each of them spurred on to pursue his own research interests, and to intermesh these interests with other colleagues in order to move forward new concepts, ideas and approaches to address glycan-related scientific challenges from new and wider perspectives. In addition, the INNOGLY COST Action will give young and smart researchers the chance to train in glycoscience innovations and thus to find new career opportunities.

https://innogly.eu/

Revealing the Milky Way with Gaia

CHAIR: Dr Nicholas Walton (UK) naw@ast.cam.ac.uk

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

The COST Action MW-GAIA will provide European leadership in understanding the Galaxy, its stars and planets, enhance the community's potential in its scientific exploitation of observations of more than a billion stars via the European Space Agency's Gaia satellite, and enhance the development of the next steps in astrometry and space astrometry missions. The Action brings together key stakeholders from across Europe, to leverage expertise and develop new techniques to fully maximise the scientific returns from Gaia's rich and complex data. Five key challenges are addressed: the Milky Way as a galaxy; the life and death of stars; planetary systems near and far; Gaia fundamentals: space and time; and the astrometry innovation challenge; towards astrometry. COST enables the vital Action activities, supporting exchanges, training and meetings. The key objectives are to increase the impact of science and European leadership in the scientific exploitation of Gaia, developing new techniques in the analysis and interpretation of its data. The Action's technological impact will be through the delivery of a key science-technical roadmap to identify the requirements and challenges of developing a future space astrometry mission building on Gaia, but moving to the sub-microarcsec realm (thereby opening up space discovery to the local group of galaxies). The Action will have a significant legacy, creating a dynamic and vibrant network of researchers with expertise in the study of the Milky Way, its constituents and the art of astrometry. Participation will be inclusive, with researchers accessing the network from across Europe, irrespective of their gender or location.

http://www.mw-gaia.org

Risk-based meat inspection and integrated meat safety assurance

CHAIR: Dr Bojan Blagojevic (RS) blagojevic.bojan@yahoo.com
FUNDING PERIOD: March 2019 – March 2023

SUMMARY

The European Food Safety Authority has recently proposed a generic framework for a modern, flexible and dynamic risk-based meat safety assurance system. Implementation of such a system is expected to be a slow and careful process involving its thorough development, fine-tuning and testing of its practical feasibility and general impacts. Currently, many research groups in Europe perform these studies, mainly at the national level, to fill the knowledge gaps related to such a new system. The main aim of the proposed network is to combine and strengthen European-wide research efforts on modern meat safety control systems. The network would allow for an exchange of ideas, experience and results of country-level research studies. Furthermore, the aim is to create a platform for training relevant participants in the new meat safety system to assist with its operability, as well as to inform relevant stakeholders about the requirements, benefits and consequences of the new system. The RIBMINS network will comprise five working groups: 1) on the scope and targets of meat safety assurance; 2) on farm-level controls and risk categorisation of farms; 3) on abattoir-level controls and risk categorisation of abattoirs; 4) on the meat safety assurance system impact of the changes, additions and alternatives to meat inspection; and 5) on the meat safety assurance system training, communication and monitoring. Overall, the establishment of the proposed network will help the full development and implementation of the general principles of the meat safety assurance system across Europe for the benefit of consumers, industry and the protection of animal health and welfare.

http://ribmins.com

The neural architecture of consciousness

CHAIR: Dr Kristian Sandberg (DK)
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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Conscious experience is central to our existence, and although important advances have been made in our scientific understanding of the phenomenon, radically different theories are still debated within the field, while clinically speaking, prognoses for disorders of consciousness can still be substantially improved. The main aim of this Action is to examine the role of cortical neural architecture in consciousness from both a basic science and a clinical perspective. This will be achieved in a joint effort aimed at building detailed neuroarchitectural models from different kinds of brain data and relating them to meticulously gathered behavioural data from healthy normal participants performing tasks associated with conscious perception/behaviour as well as to clinical data from patients with consciousness disorders. The relation between neural architecture and consciousness will be made using advanced statistical modelling, including machine learning. If the Action is successful, the resulting models can be compared in order to identify neuroarchitectural characteristics related to each consciousness phenomenon individually and in all phenomena. This can be used to form a tentative data-driven neuroarchitectural model of consciousness. Furthermore, successfully reaching the clinical sub-aims can result in a substantial increase in the predictive accuracy of prognoses for consciousness disorders. Accurate prognoses could have a substantial positive impact on the lives of patients and relatives, and could facilitate clinical decisions regarding whether to escalate or to stop treatment.

https://neuralarchcon.org/

Climate change and bats: from science to conservation

CHAIR: Prof Danilo Russo (IT) danrusso@unina.it

FUNDING PERIOD: February 2019 – February 2023

SUMMARY

Climate change poses major threats to biological communities and the ecosystem services they provide. Bats are sensitive to human-driven habitat alteration, and changes in temperature and water availability induced by climate change may affect their eco-physiology, distribution and, ultimately, their survival. Climate change is therefore likely to influence European bat populations and affect insect consumption by bats on farmland and in forests and urban areas, implying serious consequences for the conservation of European biodiversity as well as the economy. However, little scientific work has addressed this issue, so we lack the knowledge to devise mitigation strategies. The Action fills this gap by pursuing the following objectives: 1) define, predict and quantify the effects of climate change on bats across Europe, establishing how they react to different climatic conditions, assessing the current magnitude of this impact, forecasting its future effects and establishing the roles played by life-history traits and environmental factors. 2) establish strategies to develop a network to monitor and predict changes in bat distribution and inform future management and policy. This will be achieved by selecting the best monitoring approaches, identifying a set of responsive bat species to act as indicators, and facilitating cooperation between scientists and relevant stakeholders. 3) evaluate the effects of climate change on insectivory provided by bats on farmland, by: a) estimating the importance of this ecosystem service across Europe for the agricultural economy and society and monetising its current value; and b) modelling scenarios of distributional mismatch between bats and their pest prey under future climate change, as well as evaluating the economic consequences.

http://www.climbats.eu

Quantum gravity phenomenology in the multi-messenger approach

CHAIR: Prof Jose Manuel Carmona (SP) jcarmona@unizar.es

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Exploration of the Universe has recently entered a new era thanks to the multi-messenger paradigm. The detection of cosmic particles (photons, neutrinos, cosmic rays), now joined by the birth of gravitational wave astronomy, provides information about different sources in the Universe and the properties of the intergalactic medium. In particular, the most energetic events allow us to test our physical theories on energy regimes which are not directly accessible in accelerators. This, in fact, is the target of quantum gravity phenomenology, a quite recent field of physics that is trying to set phenomenological models which may incorporate some of the effects of the Planck scale, thereby providing a bottom-up approach to the widely studied quantum gravity problem. The main objective of the proposed COST Action is to gather together theoretical and experimental working groups from the relevant communities (with the correct geographical, age and gender balance) to work in the prediction and possible detection of physical phenomena characteristic of quantum gravity theories. Such cooperation is necessary to address this challenge properly, which may result in extraordinary advancements in fundamental physics. A second objective will be the formation of a generation of scientists competent in the interdisciplinary expertise who are required in the effective search for quantum-gravity footprints in the production, propagation and detection of these cosmic messengers. Whatever the outcome of this search, it will certainly have an important impact on science via a better understanding of the Universe and its fundamental laws.

https://qg-mm.unizar.es/

Accelerating Global science In Tsunami HAzard and Risk analysis

CHAIR: Prof Joern Behrens (DE)
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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Large tsunamis are low-frequency but potentially very-high-impact events that can cause extreme numbers of casualties as well as very significant economic loss, as was recently demonstrated by the Sumatra-Andaman tsunami in December 2004 and the Japan tsunami of March 2011. In both cases, the scale of the actual disaster surpassed by far the anticipated magnitudes. One reason for the underestimated risk potential can be identified by a lack of rigorous, robust and standardised hazard and risk analysis methods and associated uncertainties. While a large number of both probabilistic and deterministic methods has been proposed and used in the past, a consolidation process is dearly overdue and will require bringing together experts from diverse areas of science involved in tsunami hazard and risk analysis. This Action will use specific COST tools: workshops, networking, exchange of experts to assess current approaches in tsunami hazard and risk analysis, and evaluate them quantitatively by means of common metrics and benchmarks. It will determine gaps in scientific knowledge, methodological approaches and tools in order to achieve robust tsunami hazard and risk analysis across a variety of tsunami sources, including earthquakes, landslides, volcanoes and meteorological events; derive and agree on best practices and standards for probabilistic tsunami hazard and risk analysis, through discussions among a large group of practitioners; identify issues and challenges to orient future research; and disseminate the acquired knowledge among hazard and risk practitioners and end-users.

https://www.agithar.uni-hamburg.de

Underground Built Heritage as catalyser for Community Valorisation

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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The proposed COST Action will establish and implement an expert network, aimed at promoting balanced and sustainable approaches for conservation of underground heritage while, at the same time, realising the potential of underground space in urban and rural areas for regeneration policies. The experts will be organised into three working groups: 1) underground space conservation and monitoring; 2) underground heritage-led urban and rural regeneration; and 3) planning and governance tools. Each expert will share best practices by reporting on governance mechanisms, planning framework, and stakeholders; involvement management, financing mechanisms, technical needs, and their direct impacts on the underground built environment preservation, environment, society and economy, as well as potential negative externalities (i.e. gentrification, hard branding, mass tourism, recreational villages, underground degradation). The information collected will be the basis for developing new research and training, open and accessible to all parties interested in the underground regeneration, and will provide knowledge on the main technical and organisational barriers to underground regeneration and correlated solutions. The Action aims to guarantee continuity of use and significance of the underground historic fabric, revitalisation of the public realm and skills development for townspeople. It will disseminate knowledge on underground culture and assist local communities' decision-making with adequate cultural, scientific and technical knowledge of the underground built environment from many different aspects (i.e. archaeology, geotechnics, history, urban planning, cultural anthropology, economics, architecture, cultural tourism). Finally, it will contribute to the implementation of other EU programmes.

http://underground4value.eu/

Genome editing in plants – a technology with transformative potential

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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

A great challenge of this century is to provide adequate nutrition for a growing global population while developing a more socially, economically and environmentally sustainable agriculture able to counter climate change, biodiversity loss and degradation of arable land. Plant research and breeding are very important in meeting this challenge. Building on scientific progress, a number of genome-editing techniques have been developed over the past two decades allowing for an unprecedented level of precision in our control over genetic material and its corresponding traits. This COST Action will bring together expertise from a range of disciplines to evaluate plant genome-editing techniques and their resulting products from various perspectives. The findings will be used to design a roadmap for directing and facilitating applications of genome editing in plant research and breeding. This in turn will help to set R&D priorities and stimulate further cross-national and cross-disciplinary collaborations.

http://plantgenomeediting.eu

Mechanochemistry for Sustainable Industry

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FUNDING PERIOD: February 2019 – February 2023

SUMMARY

The Mech@SusInd network is being created to face several challenges in the EU Agenda. The EU is currently calling for strong actions to arrest, or mitigate, climate changes via a suitable programme of measures. In chemical processes, the attention is focused on the reduction of solvent waste, and the possibility of using less-toxic solvents or reagents to reduce the number of steps in the synthesis or purification processes. Another fundamental point is the quest for new raw materials which can serve as alternatives to critical raw materials or in anticipation of the possible reduced global availability of certain materials. Finally, technological leadership, innovation and integration represent the historical sources of competitive advantage for the EU chemical industry. In this respect, a significant opportunity is taking shape for the EU to take the lead in a scientific and technological area showing significant promise to beneficially impact the chemical sector in terms of product and process innovation, competitiveness and sustainability – i.e. mechanochemistry. This is a branch of chemistry focusing on the activation of chemical transformations by mechanical stresses in the solid state in the absence of solvents. Mechanochemistry has the potential to accomplish, solvent-free, the same reactions as those currently being performed in solution in laboratories and industry worldwide, with a drastic reduction in solvent waste. Solid reactions enable new synthetic pathways to be explored which can lead to new control over stereo-selectivity or stoichiometric efficiency/atom economy. Moreover, the different processes in the reactions lead to investigation in and access to poorly soluble but cheaper reactants or new raw material. The EU is fully entitled to take the lead in innovation in this area with crucial returns for other strategic sectors of the chemical industry and manufacturing activities. Indeed, mechanochemistry is rooted in Europe and the largest community of researchers involved in mechanochemistry still resides in EU countries. Physicists, chemists and engineers form a multi-faceted community with a long tradition in mechanochemical studies and unique expertise to commit

to enabling technologies. In addition, a community of technologists, entrepreneurs, industrialists and investors are ready to address the exploitation of mechanical activation methodologies in the production of chemicals. For the EU, taking the lead in mechanochemistry is a unique opportunity for scientific and technological growth that intrinsically bears the promise of sustainable innovation in the chemical industry and a definite stimulation within the economy.

http://www.mechsustind.eu

Understanding and exploiting the impacts of low pH on micro-organisms

CHAIR: Prof Peter Lund (UK) lundpa@gmail.com

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

This proposed COST Action is broad in its technical and scientific cope as its main aim is to bring together people working in quite diverse fields but with a common scientific interest: namely, understanding and exploiting the responses of micro-organisms to low pH. In this context, these organisms include bacteria, yeasts and other fungi. This topic is already being studied in considerable depth and has many important practical applications in a number of diverse sectors. However, these sectors traditionally do not communicate well with each other. A new forum for communication will be highly beneficial both for scientific progress and, importantly, for the applied fields in which this topic is important. These include the microbiology of food and drink, many aspects of industrial biotechnology and bioprocessing, and the clinical and veterinary treatment of infections in a time of increasing antimicrobial resistance. Through a combination of working groups, workshops, short-term scientific missions, and dissemination activities, plus two open conferences, this proposed action will: a) enhance our understanding of the details of how micro-organisms detect and respond to low pH; b) ensure that technical developments being made in one field are rapidly translated into other fields; c) leverage the many different areas of expertise that exist across consortium members; and d) ensure, through participation and dissemination, that these developments reach as wide an audience as possible, including pure and applied scientists in the inclusiveness target countries.

https://euromicroph.eu

CA18114

European Non-Territorial Autonomy Network

CHAIR: Prof Ivan Dodovski (MK) dodovski@uacs.edu.mk

FUNDING PERIOD: February 2019 – February 2023

SUMMARY

ENTAN is a COST Action aiming to examine comparatively and comprehensively the concept of non-territorial autonomy (NTA), in particular NTA arrangements for reducing inter-ethnic tensions within a state and to accommodate the needs of different communities while preventing calls to separate statehood. The Action will tackle recent developments in cultural diversity theories and practices; minority rights (including linguistic and educational rights); state functions and sovereignty; conflict resolution through policy arrangements; policymaking and inclusiveness; and self-governance and autonomy. The main objective is to investigate existing NTA mechanisms and policies and develop new modalities for accommodating any differences in the context of growing challenges stemming from globalisation, regionalisation and European supranational integration. Along with issues related to culture and the education of diverse groups within a nation state, and legal arrangements for recognising and practising separate identity, the Action will also focus on political strategies and policies that have the potential to increase the autonomy of stateless nations and to empower cultural, ethnic and religious communities. The network will be created according to agreed research activities, which include interdisciplinary and multidisciplinary group work, training and empowerment of young researchers, scientific conferences and publications, and dissemination of results to policymakers, civil society organisations and communities. The Action has been proposed by scholars from inclusiveness target countries and other EU Member States. It is based on past experiences, the current state of affairs, and extensive theoretical and practical knowledge, which ensures that the results and recommendations will be relevant across Europe.

http://entan.org/

Transnational Collaboration on Bullying, Migration and Integration at School Level

CHAIR: Prof James O'Higgins Norman (IE)
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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

With immigration a growing, permanent and fractious part of EU reality, integration is of foremost concern for policymakers in Europe. Schools are recognised as an essential part of social stability and a key aspect of integration policy, both at the national and EU level. Schools provide crucial education for integration and citizenship, in the long term directly affecting social status, professional achievement, economic earning power and students' understanding of cultural morality and societal principals. This enables the individual to prosper, and the state and EU to benefit and build on their potential as a valuable new resource. School safety, building inclusion and preventing bullying for all students is central to integration and well-being. Yet, in the face of a far more diverse society, schools are encountering challenges for which, in the main, they do not currently receive support. The scientific measures of school safety used today are outdated and do not reflect a modern, multicultural, multi-faith Europe, while school communities are working in a fragmented, individualised manner in the areas of inclusion and preventing bullying. This proposed COST Action aims to: boost collaboration between stakeholders to update, enhance and pilot new real-world scientific measures and approaches; collate evaluated interventions and approaches around inclusion and bullying prevention to disseminate a comprehensive programme/handbook for schools and a guideline policy document for authorities; build capacity; and working holistically towards ensuring the integration, safety and well-being of all students in EU secondary schools, to support the social stability of both the individual and society.

Aniridia: networking to address an unmet medical, scientific, and societal challenge

CHAIR: Prof Neil Lagali (SE) neil.lagali@liu.se

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Aniridia is a devastating ocular disease requiring intensive eye care, and social and community support from birth and throughout an individual's lifetime. A congenital genetic mutation causes an underdeveloped retina, cataract, glaucoma, and a progressive ocular surface disease of stem cell deficiency and loss of corneal transparency. Classified as a rare disease (ORPHA:77), aniridia is extremely challenging for an ophthalmologist, with very few effective treatments available. This stems from a lack of adequately sized patient populations to conduct coordinated clinical and research activities, and inadequate information exchange for assessing and treating aniridia, with expertise typically limited to geographically dispersed centres. Thus, the goals of ANIRIDIA-NET are to build a large, inclusive EU network of ophthalmologists, scientists, trainees, aniridia patient organisations, industry and special interest groups to create linkages and a rich training ground for a new generation of trainees. The Action also aims to improve the management of aniridia through evidence-based research, harmonised clinical protocols, pooling/sharing of samples and models, and consensus activities; and to stimulate the development of novel diagnostics and treatments for aniridia based on innovative research in regenerative medicine/stem cells, investigational drugs, gene therapy, tissue engineering, transplantation, etc. Although a rare disease, aniridia is associated with ocular-surface pathology such as dry eye, inflammation, stem cell insufficiency, nerve degeneration, and vascularisation – problems common to many ocular-surface pathologies collectively affecting large populations. Greater collaboration and sharing of information and resources in the area of aniridia is therefore also expected to have significant benefits for the treatment of larger patient populations with ocular-surface disease.

European network for Gynaecological Rare Cancer research: From Concept to Cure

CHAIR: Prof Jean Calleja Agius (MT)
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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Each year, approximately 18.5 million women are affected by gynaecological cancer, from which approximately 50% are classified as rare cancers. Delayed diagnosis of patients suffering from rare gynaecological cancers leads to poor outcomes and contributes to a huge socio-economic burden. This field is lagging behind due to distinct scientific and technological challenges facing gynaecological cancer research. Overall, the efforts to address these challenges are currently fragmented across different European countries (and beyond). The GYNOCARE Action aims to address these challenges by creating a unique network between key stakeholders covering five distinct domains (from concept to cure): basic research on rare gynaecological cancer, biobanking, the industrial dimension, legal and regulatory requirements for international trials and other research collaborative efforts, and high-quality, international and innovative clinical trials. To achieve our ambitious goals, we have devised research coordination and capacity-building objectives in accordance with the mission and vision of the COST Action. It will focus on: 1) capacity building on rare gynaecological cancer by connecting high-quality scientific communities in various disciplines, existing networks, policymakers, industrial partners, and patient organisations across Europe and beyond; 2) coordinating and contributing to the development of a research roadmap dedicated to connecting (innovative) basic research to (harmonised) biobanking to smarter clinical trials; 3) the development of a platform for sharing best practices, including funding a roadmap and legal/ethical requirements, in gynaecological cancers, with the aim of advising policymakers and other key stakeholders; and 4) providing (equal) networking opportunities for early-stage researchers and other talented young professionals.

https://gynocare.net/

Implementation Research Network in Stroke Care Quality – IRENE

CHAIR: Prof Robert Mikulik (CZ) mikulik.stroke@fnusa.cz
FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Stroke is the second leading cause of death and the leading cause of lifelong disability worldwide. Although effective methods for stroke treatment already exist, implementation of these treatment methods is very low and therefore constitutes the most challenging problem in current stroke management. In many countries, and many hospitals, patients do not receive effective treatment because the implementation framework is missing. Our interdisciplinary consortium, established in 2015, aims to understand the contextual factors, develop an implementation framework and test its effectiveness. Such a framework will be a breakthrough in public health. The research results from this Action can save tens of thousands of lives, eliminate hundreds of thousands of disabilities after a stroke, and save millions of euros in healthcare costs. Networking is an essential part of such a large-scale implementation project. The core activity of this COST Action – called IRENE – is to improve public health through: a) networking which will facilitate understanding of contextual factors, between-country differences in innovation-values fit and implementation climate; b) a quality registry which will provide a cohesive picture of the implementation of stroke treatments; and followed by c) dissemination of results to the main stakeholders (e.g. hospitals and heath ministries) to implement new mechanisms to improve the outcome of strokes. The Action will be conducted mainly in Eastern European countries where the burden of stroke is higher, the quality of stroke care is lower, and resources for healthcare are less developed compared to Western European countries. The aim is to alleviate disparities in stroke care and improve outcomes after stroke.

https://www.irene-stroke.eu/

Who Cares in Europe?

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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

This Action will define and develop an emerging research field exploring the relationships among voluntary associations, families and states in the creation of social welfare in Europe. It focuses on the question of how state welfare has emerged from the social welfare provided by non-profit, non-state institutions and individuals; how it has developed and changed over time; and how, in recent years, it has entered into crisis in many countries. The Action, which is both local and transnational, will bring together researchers and policymakers across Europe in a collaborative exchange. It emphasises the welfare state's deep historical roots, and will use local case studies to recover the voices of and contributions from individuals, families and voluntary associations. This will provide a much deeper and richer story about social protection in Europe than is currently available. By analysing the long-term development of welfare within a triadic optic, which examines the interactions among families, voluntary welfare associations and states in the creation of social welfare, the Action has the potential to radically shift dominant paradigms in the field of welfare studies. It will contribute to welfare policy development and debate by offering a historical perspective on current problems and debates and the principles and premises that underpin them.

https://whocaresineurope.eu/

Reliable roadmap for certification of bonded primary structures

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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

With the increasing pressure to meet unprecedented levels of eco-efficiency, the aircraft industry is aiming for superlight structures and in a move towards this aim, composites are replacing the conventional aluminium. The same trend is being followed by the civil, automotive, wind energy, naval and offshore industries, where the combination (or replacement) of steel with composites can increase the strength-to-weight ratio. However, the joint design is not following this transition. Currently, composites are being assembled using fasteners, which represents a huge weight penalty for composites, since holes cut through the load-carrying fibres and destroy the load path. Adhesive bonding is the most promising joining technology in terms of weight and performance. However, its lack of acceptance is limiting its application to secondary structures, whose failure is not detrimental for structural safety. In primary (critical-load-bearing) structures, fasteners are always included along bond lines – as a back-up – in case the bond fails. The main reasons for this lack of acceptance are the limited knowledge of their key manufacturing parameters, non-destructive inspection techniques, damage-tolerance methodology and reliable diagnosis and prognosis of their structural integrity. This COST Action aims to deliver a reliable roadmap for enabling certification of primary bonded composite structures. Although the motivation behind this concerns aircraft structures, which are believed to have the most demanding certification, it will directly involve other application fields with similar requirements. This network will tackle the scientific challenges in the different stages of the life cycle of a bonded structure through the synergy of multi-disciplinary fields and knowledge transfer.

http://www.certbond.eu

Cultures Of Victimology: understanding processes of victimization across Europe

CHAIR: Dr Simon Green (BE) s.t.green@hull.ac.uk

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Victimology as an academic endeavour has shown remarkable growth in the past decades, and although victims are no longer the forgotten party of the criminal justice system, the increased attention has been both topically and geographically lopsided. Victims of certain forms of criminal behaviour (domestic and sexual violence, for instance) have commanded the lion's share of academic and policy interest, with the research into victim experience being conducted mainly in North America, Oceania and North-West Europe. This has resulted in more rapid advances in certain areas of victimology, while elsewhere basic victimological questions have remained unanswered. This COST Action intends to develop an innovative, functional and overarching theoretical framework for cultural victimology. Understanding the mediating and moderating influence of cultural constructs on victimology will improve our understanding of the extent to which the current victimological knowledge base can be generalised from the types of victimisation and geographical locations that have been relatively extensively studied elsewhere. In turn, a greater grasp of this complexity will provide greater insight into the underlying causal factors of this current research base, as well as offering new perspectives and lines of inquiry. Therefore, it will not only benefit our understanding of the current grey and dark areas of victimological research, but will also shed further light on those fields of knowledge that have already been better illuminated.

European cholangiocarcinoma network

CHAIR: Dr Vincenzo Cardinale (IT)
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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Cholangiocarcinomas (CCAs) are an heterogeneous group of cancers of the biliary tree. CCA is considered one of the deadliest cancers and its incidence is increasing both constantly and dramatically in Europe. Notably, CCA is the most frequent cause of cancer metastases of unknown origin, suggesting an underestimation of the problem. CCA heterogeneity has limited the discovery of biomarkers and novel therapeutic options, hampering the development of tools for early diagnosis and effective treatment. It constitutes a major challenge for researchers, clinicians, national health systems and society, and coordinated multidisciplinary pan-European studies are still lacking. As such, the EURO-CHOLANGIO-NET European Cholangiocarcinoma Network aims to set up a pan-European-wide interdisciplinary cooperative network of stakeholders, including scientists, clinicians, regulatory authorities, small and medium-sized enterprises and industry partners, to address the CCA problem. Through the creation of shared data registries (inherent main relevant basic or clinic-epidemiologic aspects), conference calls, meetings, workshops, scientific exchanges as well as training schools, this Action will coordinate efforts aimed at advancing our understanding of CCA to translate basic research and preclinical findings into clinical practice. For this purpose, this Action will be organised into nine working groups dealing with interrelated aspects of CCA: preclinical, in-depth histomorphological phenotyping; molecular profiling; epidemiology; clinical characterisation and trials; early diagnostic biomarkers; development of novel therapeutic tools; training and education, legislation and ethics; and internal coordination and external relationships. These WGs will work as coordinated networks to construct efficient connections, exchanges and promote capacity-building objectives (i.e. data registries, young researchers' mobility, meetings, seminars, consensus guidelines and more).

https://eurocholangionet.eu/

CA18123

The European Family Support Network. A bottom-up, evidence-based and multidisciplinary approach

CHAIR: Dr Lucia Jimenez (SP) luciajimenez@us.es

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Children's best interest is placed at the forefront of social policies, giving governments the responsibility to provide parent and family support. The recent economic crisis has put parenting in a more difficult situation, along with the existence of complex family realities which need new responses requiring innovative approaches. Although recognised as central to a number of political priorities, at a European level the institutions have not yet addressed family support holistically. The Action proposes the creation of a pan-European family support network, which will include family support and parenting policies, combining both common goals across countries and recognition of the specificities of cultural and family contexts. It will build collaborative pathways between researchers, practitioners, policymakers, children and families, public and private agencies, and general society to create the necessary framework to inform family policies and practices with the underlying goal of ensuring children's rights and families' well-being. EuroFam-Net will: 1) use a pluralistic and dialogic structure to co-create responses with all the stakeholders involved in the field in close collaboration with national policies; 2) create an evidence-based framework that improves family support services, science and technology-driven policy and practice; 3) use a multi-disciplinary approach by gathering all the relevant scientific disciplines working in this field; 4) disseminate research and make use of advice mechanisms for the professional and political arena to innovate in family support services; 5) avoid the duplication of services and promote inter-sectorial coordination, increasing the efficiency of available resources.

https://eurofamnet.eu/

CA18124

European Sexual Medicine Network

CHAIR: Dr Marianne Greil-Soyka (AT) m.greilsoyka@utanet.at

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

Sexual medicine is an immense field that deals with disorders of individuals' sexual health throughout their life. Due to its broad scope, a comprehensive approach to the subject is largely non-existent: research is in short supply and few medical educators are qualified to teach the subject. Although different clinical, biological and psychosocial disciplines deal with the treatment of sexual disorders, they often do this only partially due to the particular discipline. Clinical, technological and socio-economic progress, as well as societal changes, have caused the general interest in sexual health to increase and change. Sexual medicine must also pay more attention to modern-day developments. Incidents of mass sexual violence amplify the need for novel research into sexually deviant behaviour. Mass media, including social media, have an immense impact on contemporary viewpoints on sexuality from younger generations. Research into the prevalence, pathophysiology and optimal treatment of sexual dysfunction associated with chronic illness, including cancer, becomes more important. Also important is the fact that the ageing population compels medical and psychosocial sciences to deal increasingly with the sexual health of older people. This Action aims to exchange research results produced by different disciplines in order to find commonalities in concepts and approaches to sexual medicine. It will serve as the foundation for identifying shared concepts and definitions, and the start of joint interdisciplinary research, with a particular focus on including young researchers. It will also form the conceptual groundwork for developing interdisciplinary outlines and curricula for further university education at a European standard of qualification and recognition.

https://www.esmn-cost.eu/

Advanced Engineering and Research of aeroGels for Environment and Life Sciences

CHAIR: Dr Carlos A Garcia Gonzalez (SP) carlos.garcia@usc.es

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The AERoGELS COST Action aims to bring together the knowledge on research and technology of aerogels at the European level from academia, industry and regulatory experts. Aerogels are a special class of mesoporous materials with very high porosity and tuneable physicochemical properties. Although some types of aerogels have already reached the market in construction materials and aerospace engineering, their full potential is still to be assessed for other sectors. In this Action, the use of aerogels specifically for environmental and life sciences applications will be explored in a multidisciplinary approach to tackle two of the current main European challenges: the circular economy and active ageing. The scope of the Action is to advance the state of the art on the topic by linking the knowledge and efforts of the most renowned experts on cutting-edge aerogel technology, advanced characterisation of materials, as well as on biomedical and environmental research. Aerogels will be assessed from a materials performance point of view but also regarding health and environmental implications. AERoGELS will set up a forum to disseminate knowledge to society, boost industry-academia interactions, and train young European researchers in research, innovation and entrepreneurial skills via technical schools, publications and short-term scientific mission exchanges. Finally, the interdisciplinary collaborations are expected to yield innovative and integrated solutions for the environment and life sciences. The long-term scope of this Action is to develop an aerogel technology able to improve the welfare of European citizens and to move towards cleaner and smarter production in Europe.

https://cost-aerogels.eu/

CA18126

Writing Urban Places. New Narratives of the European City

CHAIR: Prof Klaske Havik (NL) K.M.Havik@tudelft.nl
FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Europe is a continent predominantly populated across a relatively even spread of medium-sized cities. Together, these cities epitomise a rich variety of distinct urban cultures which, in turn, are embedded in urban narratives: stories rich in information regarding citizens' socio-spatial practices, perceptions and expectations. By recognising the value of these narratives, the Action aims to articulate a set of concrete literary devices within a host of spatial disciplines. It will bring together scientific research in the fields of literary studies, urban planning and architecture, and will position this knowledge vis-à-vis progressive redevelopment policies carried out in medium-sized cities in Europe The Action aims to collect current initiatives from scholars addressing urban change from the crossing point of literary studies, urban studies and architecture, with the aim of offering a conceptual framework and operative tools to analyse urban narratives and share knowledge with city makers. It defines three thematic targets to be explored both theoretically and in case studies: 1) meaningfulness: giving local communities and professionals the ability to improve their understanding of their built environment; 2) appropriation: empowering communities by improving their ability to project their feelings on their built environment; 3) integration: providing concrete tools and methods to build common ground among communities, based on the relationship between meaningfulness and appropriation of their built environment. Writing Urban Places proposes an innovative investigation and implementation of a process for developing human understanding of communities, their society, and their place, using narrative methods.

https://writingurbanplaces.eu

International Nucleome Consortium

CHAIR: Prof Marc A. Marti-Renom (SP)
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FUNDING PERIOD: May 2019 – May 2023

SUMMARY

The genomic revolution has been a unidimensional one. Chromosome maps, sequences, polymorphism databases, and the wealth of information that has been and continues to be gained from genomic studies exist independently of the cellular context. Yet our genome lives as a three-dimensional object intricately folded and packaged in the cell nucleus, structured around nuclear bodies and landmarks, and acted upon by countless force-generating nano-machines. Ultimately, then, understanding how the genome works requires elucidating the structure-activity relationships of the cell nucleus as a complex, dynamics biological system. No doubt this is an ambitious task, but it is also one of the most exciting challenges currently facing biomedical research. With the recent advances that have been made in microscopy, biochemistry and modelling, tackling this challenge requires concertation on a global scale. The field is now attracting more and more people with very diverse expertise (biologists, physicists, mathematicians, statisticians, data scientists). It is also ripe for technology transfer and production through the creation of start-ups. Consequently, the huge amount of data produced in modern laboratories requires extensive numerical analysis and modelling to be correctly analysed, and the knowledge of physical principles to be interpreted and applied. The International Nucleome Consortium will establish a worldwide community of cooperation among multidisciplinary nucleome scientists to accelerate scientific breakthroughs, leading to new concepts, innovative interdisciplinary approaches and realistic applications for health, agriculture and industry. The consortium aims to maintain Europe's leading position in this quickly developing and exciting field.

http://inc-cost.eu

Saving European Archaeology from the Digital Dark Age

CHAIR: Prof Julian Richards (UK) julian.richards@york.ac.uk
FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Making archaeological data open and freely accessible is a priority across Europe, but the domain lacks appropriate and persistent repositories. Due to the fragility of digital data and the non-repeatable nature of most archaeological research, the domain is poised to lose a generation of research to the Digital Dark Age. The key to mitigating this crisis is to bring archaeologists and data management specialists together to share expertise and create resources that enable them to address problems in the most appropriate way within their own countries. While important international standards exist and should be used, there is no single way to build a repository. To be successful, archaeologists must be at the decision-making heart of how their data is archived to ensure reuse is possible. SEADDA will be vital for establishing a priority research area in the archiving, dissemination and open access reuse of archaeological data, and includes proposers from 26 COST countries. It will bring together an interdisciplinary network of archaeologists and computer scientists, experts in archaeological data management and open data dissemination and reuse. It will create publications and materials that will set out the state of the art for archaeological archiving across Europe, recommendations to mitigate the crisis, and at least one major funding application. It will organise meetings and training that will allow archaeologists from countries with archiving expertise to work with archaeologists with few or no available options, so that they can share knowledge and create dialogue within their countries, and move forward to address the crisis.

http://www.seadda.eu

Islamic Legacy: Narratives East, West, South, North of the Mediterranean (1350-1750)

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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

The purpose of the Action is to provide a transnational and interdisciplinary approach capable of overcoming the segmentation that currently characterises the study of relations between Christianity and Islam in late medieval and early modern Europe and the Mediterranean. Over the last 30 years, some separate geographic and academic areas have been defined in this research field: the Iberian Peninsula, Italy, Central Europe and the Balkans, and Greece and the different islands of the Mediterranean. These different geographical areas have been analysed in isolation and have been further disjointed in a scientific context defined by the separation of disciplines and chronologies. The Action aims to mitigate this academic distortion by creating a common space for scientific exchange and reflection. This space will involve institutions from 26 different European and Mediterranean countries as well as 59 senior and junior researchers coming from different disciplines (history, history of art, philology, anthropology, social sciences, history of the science, politics, etc.). The creation of this network will help to provide a comprehensive understanding of past relations between Christianity and Islam in the European context by addressing three main research problems: otherness, migration, and borders. Beyond the strictly academic realm, the Action also aims to revive diversity and Euro-Mediterranean relations in education, at a time when Europe is at a cultural and political crossroads.

https://is-le.eu/

European Network for Chemical Elemental Analysis by Total Reflection X-Ray Fluorescence

CHAIR: Dr Laura Borgese (IT) laura.borgese@unibs.it

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

The ENFORCE TXRF Action aims to develop a research network focused on exploring and assessing total reflection X-ray fluorescence spectroscopy (TXRF) for the elemental analysis of challenging biological, environmental and food samples. It will create an infrastructure for scientific communication, exchange, collaboration, to enhance technical standards, advance measurement science, foster new research activities, and combine the partners' expertise in chemistry, physics, life science and engineering. This network will provide the information and tools to maximise European competitiveness in training and attracting talented scientists, supporting new sources and capabilities that improve research productivity, quality, dissemination and efficiency. The outcome is a novel technology portfolio for TXRF applications that will benefit science, the economy and society. The activities will enable breakthrough scientific developments leading to new concepts and products, increasing Europe's research and innovation capacities, and supporting European Commission regulation bodies in crucial fields, such as environmental protection, food safety, life sciences and nanotechnologies. ENFORCE TXRF will develop well-organised and sustainable partnerships, in preparation for joint projects, by the dissemination of scientific knowledge and actively engaging new stakeholders. This will increase the interest of the next generation of scientists, ensuring that Europe will remain at the front line of research for the development of new chemical analysis tools.

https://enforcetxrf.eu/

Statistical and machine learning techniques in human microbiome studies

CHAIR: Dr Marcus Claesson (IE) m.claesson@ucc.ie

FUNDING PERIOD: February 2019 – February 2023

SUMMARY

In recent years, the human microbiome has been characterised in great detail in several large-scale studies as a key player in intestinal and non-intestinal diseases, e.g. inflammatory bowel disease, diabetes and liver cirrhosis, along with brain development and behaviour. As more associations between microbiome and phenotypes are elucidated, research focus is now shifting towards causality and clinical use for diagnostics, prognostics and therapeutics, where some promising applications have recently been showcased. Microbiome data are inherently convoluted, noisy and highly variable, and non-standard analytical methodologies are therefore required to unlock their clinical and scientific potential. While a range of statistical modelling and machine learning (ML) methods are now available, suboptimal implementation often leads to errors, overfitting and misleading results, due to a lack of good analytical practices and ML expertise in the microbiome community. Thus, we propose a COST Action network to create productive symbiosis between discovery-oriented microbiome researchers and data-driven ML experts, through regular meetings, workshops and training courses. Together, we will optimise then standardise the use of these techniques, following the creation of publically available benchmark datasets. Correct usage of these approaches will allow for better identification of predictive and discriminatory omics, features, more study repeatability, and provide mechanistic insights into the possible causal or contributing roles of the microbiome. We will also investigate automation opportunities and define priority areas for novel development of ML/statistics methods targeting microbiome data. Thus, this COST Action will open novel and exciting avenues within the fields of both ML/statistics and microbiome research.

https://www.ml4 microbiome.eu/

Functional Glyconanomaterials for the Development of Diagnostics and Targeted Therapeutic Probes

CHAIR: Prof M. Carmen Galan (UK) m.c.galan@bris.ac.uk

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

Carbohydrates, proteins, lipids and nucleic acids are the biomacromolecules that constitute the fundamental building blocks of life. Among them, carbohydrates are key players involved in a myriad of molecular recognition events from protein folding, cell-cell communication, bacterial and viral infections to fertilisation. Cell-surface carbohydrates can differ considerably between cell lines as well as between healthy and disease states. These differences can be exploited for the development of early diagnostic tools, prevention and/or treatment of diseases via, for example, molecules/probes that target the interactions between key glycans and their receptors. However, despite their biological significance and therapeutic potential, these important biomolecules have been investigated to a much lesser extent compared to nucleic acids and proteins. The vast complexity of carbohydrate systems combined with the scarcity of glycan-based tools for study have proved a major challenge in glycobiology. Thus, the production of tailored and structurally defined glycan-based probes for biomedical applications represents a significant advancement in the field. Nanotechnology provides a new array of techniques and platforms to study glycosystems. Recent developments in the field have provided access to an advanced toolkit of synthetic nanomaterials and the techniques to study such molecules at high resolution. In order to successfully develop new glycan-conjugated and carbohydrate-derived materials, interdisciplinary collaboration between material scientists, chemists, immunologists, microbiologists, molecular biologists and medics is crucial. The aim of this Action is to bring together experts in these different areas from all over Europe to develop the next generation of functional glyconanomaterials for the development of diagnostic tools and targeted therapeutics.

http://www.glyconanoprobes.eu

European Research Network on Signal Transduction

CHAIR: Dr Martha Sommer (DE) marsomut@gmail.com

FUNDING PERIOD: March 2019 – March 2023

SUMMARY

All cells face the vital challenge of sensing their environments and responding in appropriate ways. This process is accomplished by transmembrane signal transduction which is present in every species and governs every aspect of how an organism functions. As regards human health, there is a huge drive to understand how transmembrane signal transduction networks function at the molecular, cellular and physiological level so that drugs can be designed to modulate different aspects of the signal transduction cascade in highly specific ways. Despite significant progress in understanding the individual components, signal transduction as a whole is not fully understood. Fundamental questions remain regarding how different signalling pathways are activated and modulated in precise and reproducible ways. Filling this gap in knowledge is absolutely necessary to advance the next generation of drugs that will achieve therapeutic efficacy while minimising side effects. A prime example of this research challenge is the large family of G protein-coupled receptors (GPCRs) which are the target of more than a third of all marketed drugs. The COST Action ERNEST will tackle this challenge by uniting scientists from different disciplines spanning the molecular, cellular, physiological and clinical perspectives. This network of diverse investigators will be uniquely able to synergistically develop an unprecedented comprehensive understanding of signal transduction that will advance drug design efforts in Europe, for the benefit of societies and human health worldwide.

https://ernest-gpcr.eu/

Genomic Blodiversity Knowledge for Resilient Ecosystems

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FUNDING PERIOD: March 2019 – March 2023

SUMMARY

In a rapidly changing environment, the resilience of ecosystems depends ultimately on species adaptability. The G-BIKE Action will enable standard and routine tools for assessing, monitoring and managing the genetic resilience and related adaptive potential of wild and captive populations. Although genetic data can be obtained for most organisms, the standardisation of protocols for detecting and monitoring the genetic diversity of species, and their potential for adaptation, is still lacking. G-BIKE will assist scientists and practitioners across the EU and particularly in ITCs to integrate genetic and evolutionary knowledge into conservation planning policies, and to promote cross-border management and long-term monitoring programmes of evolutionary potential in order to ensure the persistence of populations and species, and ultimately the continued supply of nature-based ecosystem services. Considering the drastic impacts of climate change during the coming decades, this Action is particularly urgent. The following aims will be accomplished by the involvement and balanced representation of scientists and practitioners from diverse countries: 1) clearly articulating for managers how genetic diversity can support ecosystems; 2) developing and testing best practice protocols for monitoring genetic diversity in time and space; 3) providing an online forum on emerging tools; 4) connecting all stakeholders through networking and training opportunities; 5) building a network of conservation genetics labs; and 6) building a foundation for long-term impact. Results will be disseminated in easy-to-read summaries for practitioners and outreach to the public at Natura 2,000 sites, botanic gardens and zoos as well as in scientific publications.

https://g-bikegenetics.eu/en

Fire in the Earth System: Science & Society

CHAIR: Prof Artemi Cerda (SP) artemio.cerda@uv.es

FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The FIRE Action will develop the EU-spanning network of scientists and practitioners involved in forest-fire research and land management, with backgrounds such as fire dynamics, fire risk management, fire effects on vegetation, fauna, soil and water, and socio-economic, historical, geographical, political perception and land management approaches. It will connect communities from different scientific and geographic backgrounds, enabling the discussion of different experiences and the emergence of new approaches to fire research. The main aim of FIRE is to power synergistic collaborations between European research groups and stakeholders with the objective of synthesising the existing knowledge and expertise, and defining a concerted research agenda which promotes an integrated approach to create fire-resilient landscapes, taking into account biological, biochemical and physical but also socio-economic, historical, geographical, sociological, perception and policy constraints. This has become an urgent societal need due to the expected further intensification and geographical spreading of wildfire regimes due to global change.

https://firelinks.eu

European Forum for Advanced Practices

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FUNDING PERIOD: April 2019 – March 2023

SUMMARY

The European Forum for Advanced Practices is a group of 50 researchers who work in universities, art academies, museums, private research centres or as freelancers. EFAP's broad goal is to establish a dialogue between institutional and non-institutional, public and private partners, a dialogue based on emergent new forms of research driven by doing. The network currently covers more than 15 different countries across Europe. The participants in EFAP have actively shaped contemporary forms of research in the fields of visual art, art history, philosophy, music, theatre, dance and performance studies, architecture, design and engineering. EFAP posits a notion of advanced practices that comes into being through the amalgamation of methods and practices across numerous disciplines. Such a notion is being developed to respond to two sets of urgencies: evermore complex societal challenges across Europe are demanding constant new forms of knowledge exchange and transfer, as new research formats are gaining ground and become increasingly prominent modes of research output. This requires new, multidisciplinary and comprehensive methods for capturing and assessing both their quality and their impact while operating in advance rather than retrospectively.

https://advancedpractices.net/

European Middle Class Mass Housing

CHAIR: Prof Ana Cristina Fernandes Vaz Milheiro (PT)
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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The main challenge of the COST Action proposal is to create a transnational network that gathers European researchers carrying out studies on middle-class mass housing (MCMH) which has been built in Europe since the 1950s. This network will allow the development of new scientific approaches by discussing, testing and assessing case studies and their different methodologies and perspectives. Generally speaking, MCMH has been underestimated in urban and architectural studies and there is still a lack of comparative analysis and global perspectives. The number of transnational publications and scientific meetings has also been limited. By crossing different approaches focused on architecture, urbanism, planning, public policies, history and sociology, new concepts and methodologies will arise. Therefore, the Action aims to produce a wider understanding of MCMH sprawl, deepening ongoing research and focusing on existing case studies. The current methodologies, surveys, catalogue and contextualisation will enable an initial mapping of relevant case studies, their diverse degrees of resilience and how they have been adapted to current (urban and social) conditions. It is intended to develop the knowledge of the interaction between spatial forms, behaviours and satisfaction and to combine the methodologies of architectural and social analyses. The Action will be developed by three working groups, coordinated by a core group: documenting the MCMH; development of a specific set of (new) concepts for MCMH analyses; and leverage of contemporary architecture interventions and public Policies. Eight countries will be involved with 17 researchers related to mass housing, MCMH architecture and urbanism, planning and public policies, sociological studies, architecture history and modern heritage.

https://mcmh.eu/

Research Innovation and Sustainable Pan-European Network in Peripartum Depression Disorder

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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The main goal of the Riseup-PPD COST Action is to establish a pan-European multidisciplinary network of researchers dedicated to the understanding of peripartum depression disorder (PPD), from its prevention and assessment to its treatment and global impact. Although outdated, currently available European estimates show that PPD prevalence ranges from 4% to 38%, bringing several consequences for women, newborns and the family system, and representing a socio-economic burden to society. Riseup-PPD aims to fill current gaps in PPD research, practice and social awareness by developing updated reviews to foster research efforts on the standardisation of diagnostic criteria, the development of adequate screening tools, and the cost-effectiveness of prevention and treatment programmes. In addition, the network seeks to bridge multidisciplinary knowledge on the determinants of depressive symptoms in the peripartum period, and the mechanisms of action and change. This will be achieved by supporting innovative, translational research projects on the neuropsychological mechanisms and biomarkers involved in the onset, maintenance and short- and long-term impact of PPD on women, newborns and families, followed by cost-effectiveness analysis and evidence-based implementation research projects. Finally, Riseup-PPD aims at building a shared database providing research teams with large quality-controlled datasets. Ultimately, the network will boost new implications for clinical practice, increasing the quality of cost-effective and innovative healthcare services in PPD, and achieving a real impact on end-users. This Action will strengthen Europe's leading position in PPD by means of a network that supports early-career investigators, particularly from Inclusiveness Target Countries and female researchers, assuring a geographical and gender balanced pan-European network.

https://riseupppd18138.wordpress.com/

GEnomics of MusculoSkeletal traits TranslatiOnal Network

CHAIR: Prof Fernando Rivadeneira (NL)
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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The musculoskeletal system is a key element for healthy ageing, mobility being a fundamental component of quality of life, health, and the independence of ageing individuals. The unprecedented number of discoveries arising from genome-wide association studies (GWAS) has created a new era full of translational potential in the field of musculoskeletal biology. Coupled with the growing understanding of monogenetic disorders, the GWAS discoveries have set out a roadmap characterising the biological pathways underlying the musculoskeletal metabolism. The musculoskeletal field is now confronted with new biology arising in the form of novel factors clustering in known molecular pathways, as well as with novel factors whose role and function remains to be elucidated. Several opportunities have arisen to increase the number of discoveries, such as the imminence of whole-genome sequencing efforts, the advent of a new generation of 'very-low cost' GWAS arrays, and the availability of very large mega GWAS studies like the UKBIOBANK. The challenge now is about bringing the knowledge arising from high-throughput analysis of increasingly available big data to a larger group of researchers who can contribute to: 1) generating additional genetic discoveries; and 2) laying the ground for their functional characterisation in order to translate these genetic discoveries into meaningful clinical applications. To do this, the GEMSTONE Action will be the mechanism to reach out to a wider range of researchers active in musculoskeletal biology in order to fuel the creation of discoveries and their biological relevance, which will enable their translation into treatments and new molecular definitions.

https://cost-gemstone.eu

People in Motion: Entangled Histories of Displacement across the Mediterranean (1492-1923)

CHAIR: Prof Giovanni Tarantino (IT)
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FUNDING PERIOD: April 2019 – April 2023

SUMMARY

The PIMo Action is a four-year global research project undertaken by scholars from the humanities and social sciences, including historians, scholars of literary, visual and material culture, philosophers, mathematicians, and maritime, biological, and bio-behavioural sciences. It addresses the entangled histories of displacement of human beings both within and from the Mediterranean from the 15th to the 20th centuries. The Action provides a critical historical context and understanding for the current migration crisis in Europe in terms of the intensity of emotional responses of displaced peoples and the communities they orbit and join. It investigates multiple historical case studies of the movement of people through religious persecution, slavery and indentured labour, trade, exploration, and imperialism, curiosity, and environmental and social catastrophe. Within the deeply entangled or intertwined history and cultures of the Mediterranean, the Action introduces the term 'displacement' as a way to reconceptualise the movement of people with awareness, historical acuity and compassion. Attending to the phenomenon of displacement as a connective tissue of human experience does not presume (or judge) the conditions of movement (voluntary or involuntary), but seeks to recover and understand individuals and communities in light of their particular experiences of re/location. By tracing the entangled movement of people and the objects, writing, and ideas that accompany them, this network understands displacement and dislocation as shared human experience, while remaining attentive to its geographical, political and historical specificities.

http://www.peopleinmotion-costaction.org/

An integrated approach to conservation of threatened plants for the 21st Century

CHAIR: Dr Ziva Fiser (SI) ziva.fiser@upr.si

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Even though plants represent an essential part of our lives offering exploitational, supporting and cultural services, we know very little about the biology of the rarest and most threatened plant species, and even less about their conservation status. Rapid changes in the environment and climate, today more pronounced than ever, affect their fitness and distribution causing rapid species declines, sometimes even before they had been discovered. Despite the high goals set by conservationists to protect native plants from further degradation and extinction, the initiatives for the conservation of threatened species in Europe are scattered and have not yielded the desired results. The main aim of this Action is to improve plant conservation in Europe through the establishment of a network of scientists and other stakeholders who deal with different aspects of plant conservation, from plant taxonomy, ecology, conservation genetics, conservation physiology and reproductive biology to protected area's managers, not forgetting social scientists, who are crucial when dealing with the general public.

https://www.conserveplants.eu

Network for Equilibria and Chemical Thermodynamics Advanced Research

CHAIR: Prof Demetrio Milea (IT) dmilea@unime.it

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

The thermodynamic study of chemical equilibria represents the core of many important branches of chemistry. Coordination and supramolecular chemistry, chemical speciation, molecular modelling, drug design are just few examples. The importance of chemical equilibria, and chemical thermodynamics in general, results from the simple assertion that many properties of elements and compounds depend mainly on their interactions in a given system: the biological activity of an element or molecule, or their environmental impact can be explained by a detailed study of these interactions, whose nature and strength can be evaluated by chemical equilibrium and other thermodynamic studies. For example, speciation modelling based on chemical equilibrium data is commonly used in to improve commercial products performances, investigate the mobility of pollutants and toxicants in the environment, optimize industrial processes, explain the mechanisms of action of biologically active substances. Furthermore, advanced thermodynamic studies yield deeper insights into the mechanisms of these interactions. NECTAR will combine the expertise of the large community of specialists working in this field, creating a network based on the stimulating collaboration between them, promoting knowledge exchange, and achieving high technological progress. All this will be accomplished through a fruitful collaboration between young researchers and experienced scientists, taking into consideration gender balance and maximal geographical distribution. Innovative and integrated theoretical and experimental approaches will be established and optimized. Overall, the outstanding quality of obtained results will serve as benchmark for next decades, allowing their application in the above-mentioned fields and substantially impacting on life quality of next generations.

http://www.cost-nectar.eu

Optimising Design for Inspection

CHAIR: Prof Rhys Pullin (UK) pullinr@cardiff.ac.uk

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Ultrasound based NDE techniques, energy harvesting and wireless sensor networks are being increasingly demonstrated to be effective in monitoring damage in aerospace components at a laboratory setting (TRL 3). These components include critical elements such as airframe, engines, landing gears and control surfaces. However, there is an urgent need to integrate these approaches and techniques at the inception of an aircraft. This COST Action will bring together the top European experts across these areas to support the development of an integrated framework for optimised self-sensing structures capable of diagnosis and prognosis, together with demonstrators and educational activities, including training programs, which will ultimately lead to cleaner and safer skies. This Action will maximise the full benefit of in service, continuous monitoring of critical aerospace structures by integrating ultrasonic wave based non-destructive evaluation (NDE), energy harvesting and wireless sensor technologies at the design conception phase. Optimisation (sensor/structure), computational modelling, advanced signal processing and advanced design approaches will be integrated to produce a novel framework, design tools and guidelines for the delivery of the first generation of self-sensing aircraft capable of delivering accurate structural prognosis. This will improve maintenance strategies, increase asset availability, bridge the gap between research and industry, enable increased the use of advanced materials, reduce operating costs and ultimately deliver safer and greener air transport solutions.

http://www.odin-cost.com

Dynamics of placemaking and digitization in Europe´s cities

CHAIR: Dr Nicole Shea (DE) nicole.shea@hu-berlin.de
FUNDING PERIOD: November 2019 – November 2023

SUMMARY

This Action will investigate how placemaking activities, like public art, civil urban design, local knowledge production re-shape and reinvent public space, and improve citizens' involvement in urban planning and urban design. Placemaking implies the multiplication and fragmentation of agents shaping the public realm. The Action aims to empower citizens to contribute with citizen`s knowledge, digitization and placemaking to diverse ways of interpreting local identities in European cities. The added value of digitization – understood here basically as the ongoing process of converting any kind of data from an analog into a digital format – (Jannidis/Kohle/Rehbein (2018:179) will be analyzed in the ways in which it impacts urban placemaking processes of local communities. Studying urban placemaking and digital practices of various local communities throughout Europe´s cities, this Action will understand and analyze, The impact of digitization on the common placemaking practices of urban local communities, The changing processes of citizen´s local knowledge production of placemaking, The influence of digitization on the governmentality of the local neighborhoods and co-creation of public space by various societal actors. Drawing on recent theoretical insights that point to the importance of placemaking, widening citizen´s knowledge and wider application of digitization and digital communication, the Action seeks to develop new methods for studying and comparing effects of disseminating local urban knowledge beyond cultural and societal borders. By doing so, it develops European urban research both theoretically and methodologically finding ways of channelling the results into the wider urban planning and governance processes.

http://www.placemakingdynamics.eu

CA18205

Worlds of Related Coercions in Work

CHAIR: Prof Juliane Schiel (AT) juliane.schiel@univie.ac.at
FUNDING PERIOD: September 2019 – September 2023

SUMMARY

The COST Action "Worlds of Related Coercions in worK" (WORCK) represents a radical change of perspective on labour history by contending that the coexistence, entanglement and overlapping of diverse work relations has been the rule throughout history. It seeks to overcome the classic divides of labour history discourse (productive/unproductive, free/unfree, capitalist re-capitalist) by linking the stories of work and production with those of violence, expropriation and marginalisation. Neither the male-breadwinner model nor the free wage labourer or the capitalist mode of production can form a blueprint for our endeavour; instead we address the persistence and transformation of coercion and bondage across gender orders, world empires and historical eras. WORCK will establish the following four working groups: "Morphologies of Dependence"; "Sites and Fields of Coercion"; "(Im)Mobilisations of the Workforce"; and "Intersecting Marginalities". This conceptual approach will create an academic space that cuts across standard research fields and enables exchanges between scholars working on topics as various as: construction work in ancient civilisations; indentured work and sharecropping in rural societies; chattel slavery and coolie work; debt bondage, convict labour and military impressment; and coercive mechanisms in household work and wage labour. WORCK bridges the gaps between specialised but hitherto separate subfields. Moreover, it develops an analytical framework that helps to overcome the dominance of the conceptual matrix of the modern West in the humanities and to conceptualise a new history of work. Its activities will result in a collaborative database and a wide range of dissemination activities for a broader public.

https://www.worck.eu/

Glioma MR Imaging 2.0

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FUNDING PERIOD: September 2019 – September 2023

SUMMARY

In Europe, 50,000 new cases of primary glioma occur each year, and this number is expected to rise with the aging population. Well-established international consortia are putting tremendous research efforts into a better understanding of glioma pathology and improved treatment strategies. Magnetic resonance imaging (MRI) only has a minor role in these research efforts, despite being a widely available medical imaging modality and whilst advanced MRI techniques are emerging with great potential for improved characterisation of glioma. To exploit advanced MRI to the fullest, two issues need to be solved: 1) The scattered research landscape in which advanced MRI is being developed for glioma imaging. 2) The limited presence of advanced MRI research in established consortia for clinical work and research in glioma. This Action aims to build a pan-European and multidisciplinary network of international experts in glioma research, patient organisations, data scientists, and MR imaging scientists by uniting the glioma imaging community within Europe and progressing the development and application of advanced MR imaging for improved decision making in diagnosis, patient monitoring, and assessment of treatment response in clinical trials and clinical practice. This Action will bring Europe to the global forefront on glioma imaging research, by providing recommendations and open-access software tools that will accelerate the bench-to-bedside translation of advanced MRI techniques. These scientific developments will further the understanding of glioma pathophysiology facilitating scientific breakthroughs in novel therapies and improve personalised patient management ultimately increasing the quality of life of glioma patients.

http://www.glimr.eu

Biodiversity Of Temperate forest Taxa Orienting Management Sustainability by Unifying Perspectives

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Forests serve economic, social, cultural and environmental purposes, offer habitats for most terrestrial organisms and play a major role in mitigating climate change. Virtually all European forests are impacted by management, with substantial effects on biodiversity and ecosystem functions. Current European indicators of sustainable forest management mostly derive from information traditionally collected for timber production assessment, and include scarce direct information on biodiversity. Time is ripe to change this perspective by valuing existing information able to link forest multi- taxon biodiversity and management through observational and experimental approaches. The Action challenge is to increase the degree of sustainability of European temperate forest management for biodiversity. It will adopt a bottom-up approach by: i) creating a synergy of local research efforts; ii) using information on several taxa to inform sustainable management. The Action network will make available existing information on multi-taxon biodiversity, structure and management for more than 2,100 sampling units across all temperate and hemiboreal forest types, and will involve managers of up to 200 million hectares of forests, as well as a large number of protected areas' managers. Action objectives are to deliver:

- a standardized platform of multi-taxon data for European forests;
- a network of forest sites with baseline information for future monitoring; shared protocols for multi-taxon sampling;
- an analysis of the relationships between multi-taxon biodiversity, structure and management; a coordinated network of forest manipulation experiments;
- indicators and thresholds of sustainable forest management directly tested on biodiversity; management guidelines to be applied foremost in forest certification and within protected areas.

https://www.bottoms-up.eu/en/

Novel tools for test evaluation and disease prevalence estimation

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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Epidemiological studies assessing disease prevalence are critically important to both the identification and control of pathogens in humans and animals (including zoonosis and food borne outbreaks). However, countries typically collect data in a way that is best suited for their specific needs, and non-standardized sampling strategies and diagnostic methods produce prevalence estimates that cannot be directly compared. Hence, the need for harmonization, which has been often highlighted in reports of relevant EU institutions, like the ECDC and EFSA. Despite the availability of appropriate statistical methods – Bayesian Latent Class Models (BLCMs) – that adjust for the imperfect accuracy of the diagnostic process and produce comparable prevalence estimates, the number of research studies and scientific reports that use them is small compared to the number of instances that use of such methods would have been optimal. The objective of this proposal is to coordinate and promote the implementation of BLCMs through networking and knowledge transfer between BLCM experts and researchers working in statistics, epidemiology, diagnostics and population health. Specifically, we will a) increase the visibility and collaboration of BLCM researchers, b) promote stakeholder engagement, c) provide training and networking opportunities for ECRs and ITC researchers, d) create separate training opportunities for policy makers and stakeholders, e) establish a free online BLCMs repository, f) set up an International society for BLCMs and g) organize the first international conference of this society. The strongest asset of this proposal is its strong interdisciplinary nature and broad network of proposers.

https://harmony-net.eu/

European network for Web-centred linguistic data science

CHAIR: Dr Jorge Gracia (SP) jor.gracia@gmail.com
FUNDING PERIOD: October 2019 – October 2023

SUMMARY

The main aim of this Action will be to promote synergies across Europe between linguists, computer scientists, terminologists, and other stakeholders in industry and society, in order to investigate and extend the area of linguistic data science. We understand linguistic data science as a subfield of the emerging "data science", which focuses on the systematic analysis and study of the structure and properties of data at a large scale, along with methods and techniques to extract new knowledge and insights from it. Linguistic data science is a specific case, which is concerned with providing a formal basis to the analysis, representation, integration and exploitation of language data (syntax, morphology, lexicon, etc.). In fact, the specificities of linguistic data are an aspect largely unexplored so far in a big data context. In order to support the study of linguistic data science in the most efficient and productive way, the construction of a mature holistic ecosystem of multilingual and semantically interoperable linguistic data will be required at Web scale. Such an ecosystem, unavailable today, is needed to foster the systematic cross-lingual discovery, exploration, exploitation, extension, curation and quality control of linguistic data. We argue that linked data (LD) technologies, in combination with natural language processing (NLP) techniques and multilingual language resources (LRs) (bilingual dictionaries, multilingual corpora, terminologies, etc.), have the potential to enable such an ecosystem that will allow for transparent information flow across linguistic data sources in multiple languages, by addressing the semantic interoperability problem.

https://nexuslinguarum.eu

Oxygen sensing a novel mean for biology and technology of fruit quality

CHAIR: Dr Julien Pirrello (FR) julien.pirrello@ensat.fr

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

It is widely accepted that consumption of fruit and vegetable is beneficial to human health due to their content of essential nutrients such as vitamins and antioxidants. Any strategy aimed at increasing fruit consumption must necessarily improve the organoleptic qualities of these commodities since fruit quality is judged by the consumer not at the time of harvest but after a post-harvest period that can be long due to the complexity of the distribution channels. Fruits continue to evolve during their post-harvest shelf life which results in substantial deterioration. Postharvest losses are 30% of total fruit and vegetables production in Europe. Therefore, the control of the ripening process is instrumental to maintaining high nutritional and sensory values and to reducing post-harvest losses. Post-harvest management of fruits relies on controlled or modified atmosphere and on packaging. The recent discovery that factors involved in sensing low oxygen and oxidative stress are involved in ripening opens new research avenues for controlling fruit quality via innovative breeding strategies and new dedicated technologies. By bringing together researchers from different disciplines, the action is anticipated to bring major breakthroughs in the understanding of fruit physiology, thus providing new targets to control fruit quality and post-harvest shelf life. The research will implement advanced methodologies and concepts and will significantly enhance European competitiveness through promoting training of early stage researchers in cutting-edge technologies. By combining studies on different models this Action will lead to advances that will translate into novel practices and technologies to improve fruit sensory and nutritional qualities.

http://roxycost.toulouse-inp.eu/en/index.html

Perinatal Mental Health and Birth-Related Trauma: Maximising best practice and optimal outcomes

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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Unlike other sources of trauma, perinatal or birth-related trauma is relatively unrecognised. Evidence suggests up to 30% of women describe their birth experience as traumatic and experience some symptoms of intrusion, avoidance or hyper-arousal. Meta-analyses show post-traumatic stress disorder (PTSD) affects 4% of women after birth and up to 18% of women in high risk groups. Rectification of this situation is essential. In 2016, 5.11 million babies were born in Europe, indicating that up to 1.5 million women may have had sub-optimal birth experiences and over 200,000 may have developed PTSD as a result. Developmental research has firmly established that the quality of infant-parent relationships is a critical factor in early and later childhood development, consequently, a family-centred approach to any investigation of birth-related trauma is critical, as trauma can be transmitted within the family system. Given the enormous economic burden it places on women, health systems, and particularly children, relatively small improvements in services to prevent, detect and treat this problem can benefit society significantly. The main aim of this Action is two-fold. The Action will establish an international multidisciplinary network of researchers, clinicians, NGOs and SMEs to 1) consolidate and disseminate current evidence and coordinate a joint effort to seek ways to prevent, minimise and resolve birth-related trauma, and to optimise emotional and psychological outcomes for parents and families and 2) accelerate the translation of that knowledge into best practices that can be shared across Europe to reduce the societal and economic burden arising from birth-related negative/traumatic experiences.

https://www.ca18211.eu/

Molecular Dynamics in the GAS phase

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Emerging highly advanced ion-beam traps and storage rings combined with synchrotrons, X-ray facilities, and high performance computers offer completely new ways to study Molecular Dynamics in the GAS phase (MD-GAS). Cryogenic traps and rings will allow studies of decay and reaction processes involving molecular ions in well-defined conformations and in single or narrow ranges of quantum states. The MD-GAS COST Action aims to further develop and fully exploit the exceptional potential of the above range of tools to unravel the connection between the initial energy transfer in interactions between isolated molecules or clusters and photons, electrons, or heavy particles (ions, atoms, molecules) and the related molecular dynamics in unexplored time domains ranging from sub-femtoseconds to minutes and hours. Furthermore, the Action aims to identify reaction mechanisms and routes that lead to the growth of new molecular species, clusters and aerosols. The new knowledge will be important for fundamental atomic and molecular physics, chemical physics, and for applications in radiation therapy and -damage on the nanoscale, astrochemistry, astrobiology, atmospheric science, and climate research. The MD-GAS Action is organized in three Working groups: 1) New high-performance instrumentation and experimental methods to study gas phase molecular dynamics at ion-beam storage rings and traps, at synchrotrons and X-ray facilities; 2) Survival and destruction of molecules following their processing by heavy particles, electrons, or photons; 3) Charge-, energy flow, and molecular growth processes in intermolecular and intracluster reactions.

http://www.mdgas.eu/

Rural NEET Youth Network: Modeling the risks underlying rural NEETs social exclusion

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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

This proposal encompasses the creation of a European-led multidisciplinary network from countries showing higher NEET youth rates in rural areas. Rural NEETs' Youth Network (RNYN) aims at developing a model of comprehension for rural NEETs' social exclusion risk and protective factors based on the bio-ecological model. It focuses on three specific goals: 1) upholding future research capability, with an emphasis on Early Stage Researchers (ESR) and Inclusiveness Target Countries (ITC); 2) creating a rural NEETs' online observatory; and 3) fostering knowledge use by policy makers and practitioners. The RNYN work plan will be produced by 4 working groups; it will contribute to define a coherent model for future research, based on an intensive survey of national and cross-national trends regarding rural NEETs' profile and support systems, as well as methodological and intervention best-practices in the field. RNYN added value stems from an eclectic theoretical, disciplinary, institutional and international approach and in upskilling ESR in ITC that are more affected by high rural NEET rates. In the long run, RNYN's scientific impact will lead to the creation of a rural NEETs' observatory, integrating ESR in a broad multidisciplinary community and strengthening the COST Inclusiveness Policy. Long-term socio-economic impact is expected to be translated into (inter)national legislation to tackle rural NEETs' needs and promote sectoral innovations. RNYN is a timely proposal by creating networks platforms to organize findings, connect critical mass dealing with rural NEETs and build up research capacity. It is also socially relevant, by aiming at informing policies and on-the-ground practices.

https://rnyobservatory.eu/web/

The Geography of New Working Spaces and the Impact on the Periphery

CHAIR: Prof ilaria mariotti (IT) ilaria.mariotti@polimi.it
FUNDING PERIOD: October 2019 – September 2023

SUMMARY

The aim of the present COST proposal is threefold. First, it aims to share the first outcomes of some funded international research projects on new working spaces as Coworking (CS) and Maker Spaces (MS), which: i) identify new working spaces typologies (tassonomy); ii) reveal their spatial distribution and explain the location patterns. Secondly, through the comparison and dissemination of the first results of these international research activities, the Action aims at identifying, measuring and evaluating the (direct and indirect) effects of these new working spaces (Atlas) in order to understand whether and how they have promoted – with or without the help of public subsidies and planning measures –: a) regional competitiveness, economic performance and resilience; b) entrepreneurial milieu; c) knowledge creation within regional innovation system, retaining knowledge workers and the creative class; d) social inclusion and spatial regeneration of peripheral areas The third aim is to collect, discuss and develop guidelines for tailored policy and planning measures (Tool Box) to foster the positive effects of new working spaces through the promotion of agreements and cooperation with local, regional and/or national public administrations/stakeholders, as well as try to reduce their negative effects on the neighbourhoods (i.e. gentrification). On the basis of these results, the Action aspires to be followed by a wider research project, which will be prepared for competitive international calls, and will develop empirical analyses about the implementation of the proposed measures in local, regional or national specific context.

https://www.nmbu.no/en/projects/new-working-spaces

CA18215

China In Europe Research Network

CHAIR: Dr Nana De Graaff (NL) n.a.de.graaff@vu.nl

FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Nowhere has the recent increase in foreign direct investment from rising China been more rapid than in Europe. It ranges from manufacturing, energy, utilities and transport, to financial services, real estate and sports and has been expanding from acquisitions of European firms to greenfield and portfolio investment. The perceived challenges posed by these investments has led to increasing political and media attention, including calls for EU vetting and regulation of acquisitions. Academic research on the phenomenon is however lagging behind these developments. Existing studies moreover tend to have a mono-disciplinary, national or sectoral focus. Over-arching conceptions of the interconnections between investments in multiple sectors and the often cross-European nature and intent of Chinese investments, as well as their political and geopolitical implications, is almost entirely absent. This lack of knowledge does not augur well for the formulation of appropriate policy responses direly needed to engage constructively with rising China. In the light of these scientific gaps and policy needs and by bringing together the leading and pioneering researchers from across Europe and beyond (e.g. China, USA), the aim of this Action is to:a) pool current and stimulate further research on China's deepening economic engagements with Europe b) develop an interdisciplinary, holistic, cross-sectoral and pan-European understanding of the variegated impacts and strategies associated with these engagements; c) comprehend the likely political and geo-political consequences of these; and d) generate input on the policy implications of these issues involving relevant agencies from the EU, member countries, business, trade unions and other interested parties.

https://china-in-europe.net/#

Network for Research in Vascular Ageing

CHAIR: Dr Christopher Mayer (AT)
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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide, regardless of gender, ethnicity or income. The concept that vascular age, as opposed to chronological age, is better related to the prognosis of CVD is rapidly evolving. Arterial stiffness is an important component of vascular ageing and a potent CVD risk predictor, and as such is emerging as an appealing therapeutic target. Despite recent technological advances for the measurement of vascular ageing in clinical practice, unmet needs remain including: complexity of use and heterogeneity of approaches, insufficient validation in clinical settings, fragmentation of expertise, and lack of research driven studies regarding treatment and head-to-head comparisons between different techniques. Therefore, the aim of the COST action is: To establish a network which will work to refine, harmonise and promote the use of vascular ageing measures, in order to improve clinical practice and to reduce the burden of CVD globally. This will be achieved by: Refining the development of novel, easy-to-use technologies for the diagnosis, prevention, treatment and monitoring of vascular aging by cross-talk between industry and scientists using a translational approach and establishing protocols for validation of new technologies. Harmonising knowledge by initiating a registry to complete clinical validation of the most established surrogate endpoints, including comparisons of techniques, and by initiating peer network driven intervention studies to utilize the multiplicative effect of the network. Promoting a vascular ageing culture and to propagate the use of technologies and preventative strategies, fostering solutions feasible in low income countries.

http://www.vascagenet.eu

European Network for Optimization of Veterinary Antimicrobial Treatment

CHAIR: Mr Peter Damborg (DK) pedam@sund.ku.dk

FUNDING PERIOD: November 2019 – November 2023

SUMMARY

The global antimicrobial resistance crisis has been the driver of several international strategies on antimicrobial stewardship. Despite their good intentions, such broad strategies are only slowly being implemented into "real life". This is particularly unfortunate for veterinary medicine, which is challenged by i) a shortage of experts in key disciplines related to antimicrobial stewardship, ii) few antimicrobial treatment guidelines, and iii) inferior diagnostic tests compared to human microbiology. The aim of this Action, which is composed of 48 proposers from 29 countries, is to optimize veterinary antimicrobial use with special emphasis on the development of antimicrobial treatment guidelines and refinement of microbiological diagnostic procedures. For this purpose, the Action will first survey the state-of-the-art in terms of microbiological diagnostic practices and veterinary treatment guidelines across Europe. Secondly, tools in the form of an extensive European strain database and a standard for making antimicrobial treatment guidelines will be created. Third, Action Participants will exploit these tools for the development and refinement of microbiological methods and European treatment guidelines. Finally, the surveys, tools, diagnostic methods, and treatment guidelines will be disseminated to national and international stakeholders. Furthermore, the Action will recommend priority research areas for future optimization of antimicrobial treatment in animals, and develop a roadmap outlining how European countries can advance to a common high level of veterinary antimicrobial stewardship. The planned investigations and the educational activities will raise the critical mass of expertise in veterinary antimicrobial stewardship in Europe, especially in less resourceful countries and among Early Career Investigators.

https://enovat.eu/

European Burden of Disease Network

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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

What are the most relevant diseases in a country? Which risk factors are the strongest contributors to disease and death? How is the impact of different diseases evolving over time, and how does it compare between countries and within subnational units? As the need for prioritising the use of available resources constantly increases, a timely, sound and comprehensive answer to these fundamental questions is more than ever needed to inform public health decision making. Driven by the impact of the Global Burden of Disease study, several researchers and national and international health institutes have adopted the burden of disease approach to address these questions. The complexity of the burden of disease approach however resulted in major disparities in research capacity across Europe. The burden-eu COST Action will address current challenges by 1) stimulating interaction between existing efforts, 2) supporting technical capacity building at country level, 3) providing a platform to support methodological advances, and 4) addressing the need for an actionable understanding of the process underlying knowledge translation. The Action will have an interwoven structure of 3 vertical and 2 horizontal pillars. The vertical pillars focus on specific burden of disease applications – i.e., non-communicable diseases and injuries (WG1), communicable diseases (WG2), and risk factors (WG3). The horizontal pillars focus on cross-cutting and holistic activities – i.e., burden of disease methodology (WG4) and knowledge translation (WG5). While the vertical pillars reflect the current fragmented nature of the burden of disease universe, the horizontal pillars provide the much-needed bridge between these different worlds.

https://www.burden-eu.net/

Research network for including geothermal technologies into decarbonized heating and cooling grids

CHAIR: Mr Gregor Goetzl (AT) gregor.goetzl@geologie.ac.at
FUNDING PERIOD: October 2019 – October 2023

SUMMARY

The Action addresses the inclusion of geothermal technologies into district heating and cooling systems in Europe to foster the de-carbonization of the heating & cooling market. With regard to technological solution the Action follows a strong bottom – up approach. Shallow-, intermediate as well as deep geothermal methods are considered in monovalent or multivalent grids. Geothermal may act as a heating source, sink or storage and may be combined with other technologies like Carbon Capture and Utilization. The Action covers networking, knowledge exchange & transfer, training and stakeholder interaction activities based on case studies to investigate and promote solutions and roadmaps for raising the RES share in public heating and cooling grids to at least 30% in 2030 and at least 50% in 2050.

https://www.geothermal-dhc.eu/

European network of FURan based chemicals and materials FOR a Sustainable development

CHAIR: Dr Andreia F. Sousa (PT) andreiafs@ua.pt

FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Modern society relies on a huge quantity of polymeric materials. However, today, these materials are still almost exclusively based on fossil-resources and evolution to a more sustainable model of development is required. In this perspective, biomass and, in particular carbohydrates from, for example, low value biomass wastes, are outstanding starting feedstocks for the production of added-value chemicals and products. One of such is 2,5-furandicarboxylic acid (FDCA). Nevertheless, efforts on FDCA-based products development have been scattered in individual scientific activities, and moreover joint efforts between Academy and Industry have also been rare, hampering their successful industrialisation and market introduction. Precisely, this Action will master the scattered pan-European individual efforts to design innovative routes to FDCA-based chemicals and polymeric materials towards lab-to-industry-to-market, by gathering, for the first time, a real critical mass along the complete value-chain, including several experts in FDCA synthesis, polymer science and general materials developing and chemical-physics; together with producer, manufacture and recycling industrial stakeholders; LCA and techno-economic viability experts. The Action will accomplish these targets by pursuing two-parallel strategies. Firstly, supporting an 'holistic vision' in which FDCA synthetic routes, polymers & polymeric materials development, characterisation, as well as key technical, economic, environmental and social factors are considered together, aiming at supporting and identifying solutions to successful market introduction. Secondly, using intersectorial knowledge, supported by dissemination and networking tools to provide an open platform for collaboration and a common vision addressing research, human resources qualification and industrial implementation.

https://www.fur4sustain.eu

PEsticide RIsk AssessMent for Amphibians and Reptiles

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Amphibians and reptiles have been until recently the only two vertebrate classes not directly considered in the environmental risk assessment (ERA) of pesticides. The risks posed by these products on amphibians and reptiles have been assumed to be covered by assessments conducted on other vertebrates. The European Union published in 2013 the two first regulations incorporating specifically amphibians and reptiles into pesticide ERA. Following this legal requirement, the competent EU agency, the European Food Safety Authority, published in February 2018 a scientific opinion reviewing the state of the science relative to pesticide ERA for amphibians and reptiles. The scientific opinion constitutes the basis for the future development of a guidance document that will detail the procedures to be followed for possible pesticide authorization. The scientific opinion highlighted the scarcity of knowledge and identified those aspects that should be addressed before the elaboration of the guidance document to guarantee a protective ERA for amphibians and reptiles while keeping vertebrate testing to a minimum. The action PERIAMAR will establish a multidisciplinary network of scientists from research institutions, regulatory agencies, chemical industry, environment-focused NGOs, and research private business that will analyse the available information and design an ERA protocol for possible implementation in the future guidance document. In addition, networking, training and dissemination activities will contribute to create a critical mass capable to address those knowledge gaps requiring further research on the long term, in order to maintain an ERA scheme safe enough to protect amphibians and reptiles from pesticide impacts

https://periamar.com/

CA18222

Attosecond Chemistry

CHAIR: Prof Fernando Martín (SP) attochem@uam.es

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Recent developments of ultrashort intense light sources operating in the XUV and X-ray spectral regions promise to revolutionize chemistry, as they will give access to dynamical processes occurring in the attosecond time scale (1 asec = 10-18 s), the natural time scale for electronic motion in atoms and molecules. Thus, such light sources will allow one to address new fundamental questions about the role and possible control of electron dynamics in chemical reactivity, to investigate photoinduced charge migration in relevant molecular systems, and to image, with asec resolution, fast structural changes in molecules during proton transfer, isomerization, or motion through conical intersections. Large-scale facilities are currently being developed all over Europe for this purpose (ELI-ALPS, EuXFEL, FERMI, SwissFEL, etc.), accompanied by an increasing demand of accurate theoretical support for an optimal use of these resources. The AttoChem network will coordinate experimental and theoretical efforts to exploit the large potential of attosecond techniques in chemistry, with the aim of designing new strategies for the control of charge migration in molecules by directly acting on the attosecond time scale. This ability will be used to selectively break and form chemical bonds, thus opening new avenues for the control of chemical reactions. The results of the Action are expected to have a significant impact in several areas of chemistry, such as photovoltaics, radiation damage, catalysis, photochemistry, or structural determination. AttoChem will also act as a liaison with the relevant stakeholders to bridge the gap to industrial applications.

http://www.attochem.eu/

Future communications with higher-symmetric engineered artificial materials

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

The HiMat Action has the ambition to promote an international research community proposing innovative solutions to the demand of omnipresent connections in today's society. Higher data rates and shared platforms stimulate a revolution in terms of device technologies in different contexts. These global new trends can only be satisfied if a new class of communicating devices becomes available at millimeter waves. HiMat will investigate the electromagnetic properties of new classes of artificially engineered materials. They are made of periodic cells whose inner structures have higher symmetries, such as glide or twist symmetries. As an example, while a periodic structure is invariant after a translation, a glide-symmetric structure is invariant after a translation and a mirroring. These symmetries lead to marvellous uncommon properties: ultra large bandwidth of operation, reduced losses, scanning capabilities, and enhanced stopband for Electromagnetic Bandgap materials. They have the potential to meet the expectation of new communication devices. The novelty of the subject motivates the need for a diverse network, since it is still difficult to select subactivities independent from each other. Different scientific backgrounds – physics, engineering, numerical modelling, and companies – will definitely contribute to the definition of meaningful research lines. Several young researchers and female investigators are indicators of values promoted by the Action, which will drive the discussions with end-users and policymakers. HiMat will contribute to the impact of European research on public scientific awareness, societal change and economic development, by granting the know-how of an emerging technology and enabling transfer of results for exploitation.

https://symat-cost.eu/

Green Chemical Engineering Network towards upscaling sustainable processes

CHAIR: Dr Ana Rita Duarte (PT) aduarte@fct.unl.pt

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

The objective of this COST action is to promote and boost the industrial application of green chemistry and sustainable technologies, developing the tools for the scale-up and implementation of emerging processes into industry. This can only be successfully achieved through the connection of working groups in emergent areas such as: best use of raw materials; use of clean solvents; efficient use of energy and production of minimal amount of waste. The development of novel processes and high added value products from the integration of highly innovative technologies has been pursued and it is the objective of different programs and projects. Within these settings, GREENERING arises to provide tools and knowledge to the participants enabling them to be highly competitive in new breakthrough developments. To achieve this, the GREENERING consortium will gather experts from academia, industry and technology transfer institutions with the aim to: i) create a network with common interests; ii) create working groups to influence decision makers and stakeholders in adopting sustainable processes; iii) create competitive consortiums able to apply to H2020 competitive calls and iv) increase the entrepreneurial mindset of researchers and particularly young students who with their youth and wilful energy will be able to transpose technology into products. Additionally, this Action will aim to provide long-term collaborations between academic institutions and companies which will ultimately result in the implementation of green processes at industrial scale and transfer of specialized technology into the market, being fully aligned with Europe's interest in creating highly competitive sustainable companies.

https://www.greenering.eu/

Taste and Odor in early diagnosis of source and drinking Water Problems

CHAIR: Dr Triantafyllos Kaloudis (GR) t_kaloudis@icloud.com
FUNDING PERIOD: August 2019 – August 2023

SUMMARY

Unpleasant taste and odor (T&O) of water can indicate quality problems or possible risks for human health and can make water unacceptable by consumers. A plethora of water T&O of natural or anthropogenic origin can enter water at the source, during water treatment or in distribution networks. Resolution of water T&O problems requires integration of a) sensory analysis to describe the problem, b) chemical analysis to determine the identity and concentration of T&O c) assessment of associated risks and d) suitable water treatment to control T&O. Expertise in Europe across those dimensions are yet scattered and fragmented. The main aim of the proposed Action (TOPWATER) is to increase capabilities and capacities in Europe for solving water T&O, by creating the first European network of multi-disciplinary experts, end-users and stakeholders in the field. An "innovation by integration" approach is adopted, incorporating novel cross-sector knowledge transfer from the food sector, new international collaborations, vertical "source to tap" risk assessment strategies and horizontal integration with overlapping sectors, i.e. aquaculture, manufacturers of materials in contact with water, sensors and analytical technologies. TOPWATER will have strong impact in improving protection of public health and water resources, quality of life, use of tap water, consumer's awareness and involvement in water quality issues and professional development of young researchers in the field. It will largely contribute to the implementation of the new (recast) EU Drinking Water Directive and to the development of European leadership in the science and technology of water quality.

New approaches in detection of pathogens and aeroallergens

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Bioaerosols are among the most complex components in the atmosphere. Bioaerosols are relevant as important pathogens in crops and on trees, as aeroallergens in relation to human health and as catalysts for physical processes in relation to climate such as cloud formation processes. For decades the backbone in the European monitoring network of bioaerosols in relation to crop and human health has been simple impactors that trap the bioaerosols on a sticky surface followed by optical identification using microscopes. This approach is both time consuming, expensive and limiting with respect to the progress of science. The last five to ten years a range of new techniques have become available. The techniques can enable a number of scientific breakthroughs in the general understanding of bioaerosols and how they interact with the environment. This COST action will establish an interdisciplinary network of experts currently involved in the detection of bioaerosols using both existing methods as well as upcoming technologies such as real or near real-time technologies from atmospheric chemistry& physics or eDNA methods used in molecular biology. A main objective is to critically address the barriers that limits the penetration of new methods in detection of bioaerosols. The cost action will stimulate both research and technological development, e.g. by developing approaches for integration of multiple methods for detecting bioaerosols and how to handle data using numerical approaches in a big data environment by using fungal spores and pollen as examples.

The Core Outcome Measures for Food Allergy

CHAIR: Dr Daniel Munblit (UK)
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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Food allergy is a major societal challenge in Europe. The disease affects 6%-8% of children under the age of 3 years, and 2-3% of adults and has a quality of life impact similar to other major chronic conditions. Food allergy is a major financial burden, with significant impact on healthcare, education, food and catering industries. New treatments for food allergy are in development. There is however no agreed set of Core Outcomes for evaluating these new treatments. This may prevent the development of effective treatments with marketing approvals from regulatory authorities, for food allergic Europeans. Core Outcome sets ensure that trial outcomes are relevant to patients, clinicians, healthcare providers and regulators; and they allow trial outcomes to be combined in meta-analysis, so that new findings are capitalized on as soon as possible. The Core Outcome Measures for Food Allergy (COMFA) project is a multidisciplinary network involving all relevant stakeholders aiming to advance food allergy research and innovation by a) defining the scope and applicability of food allergy Core Outcome sets; b) developing Core Outcome sets and measurement tools for food allergy; c) reaching a consensus on terminology and definitions of measurement properties for food allergy Core Outcomes. This project addresses the Societal Challenges in Health by improving our understanding of health and our ability to reliably monitor health outcomes and demonstrates new options for healthcare delivery. The outcomes will help improve the quality of clinical trials, and the Action will advance the career of young researchers, strengthening Europe's leading position in pharmaceutical sciences.

Global Atrocity Justice Constellations

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FUNDING PERIOD: September 2019 – September 2023

SUMMARY

Most research on atrocity crimes has been focused the international criminal courts and tribunals (ICTs). These institutions were created from the mid1990s to adjudicate criminal responsibility for genocide, crimes against humanity and war crimes. The ICT-centred perspective (that also pervades popular and political discourse) is problematic because it overlooks the larger space in which these courts exist. Global Atrocity Crimes Constellations (JUSTICE360) reverses the ICT-centred paradigm to focus instead on how ICTs are received in domestic contexts and how this reception shapes the space in which they work. Through this change of perspective, the Action constructs an unprecedented panoramic view on the global and cross-systemic impacts of international criminal justice. Under this new paradigm, ICTs are seen as institutions working in larger global atrocity justice constellations. Such constellations are comprised especially of states, state institutions, civil society, and population at large. By conducting case studies in almost 40 countries representative of the larger global relations between states and ICTs, JUSTICE360 will build unique data on how such states perceive and handle international crimes, perpetrators and victims. This data will be built as a collective endeavour by an interdisciplinary research group representative of the countries selected for case studies. Through this unprecedented study of global atrocity justice constellations, JUSTICE360 will contribute highly original knowledge not only on how domestic systems have responded to international crimes, victims and perpetrators; but also how these responses have shaped and reshaped the space in which ICTs work and thus their effectiveness and potential for success.

https://justice-360.com/

NON-CONVENTIONAL YEASTS FOR THE PRODUCTION OF BIOPRODUCTS

CHAIR: Dr Elia Tomás Pejó (SP) elia.tomas@imdea.org
FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Economically viable conversion of low-cost renewable feedstock into biofuels and biochemicals is of outmost importance to the establishment of a robust bioeconomy. In this context, the use of microorganisms for the generation of bioproducts from renewable resources offers many advantages. More specifically, yeasts have great potential to generate industrially relevant compounds from natural sources and wastes in a cost-effective and environmentally friendly manner. Non-conventional yeasts are attracting more and more attention owing to their potential to metabolize complex carbon sources, their alternative metabolic routes and their ability to cope with wide range of process conditions. In this context, this Action calls for a strong investment in capacity building through molecular biology, genetic and physiology studies of the non-conventional yeast-derived bioproducts synthesis, which at the moment is relatively scarce. Improving the knowledge on how non-conventional yeasts strains metabolize unusual substrates (carboxylic acids and biomass-derived sugars) or accumulate unusual products (food additives, enzymes, lipids), are fundamental issues to boost the transition to a more sustainable industry based on renewable raw materials. This Action brings together an innovative group of researchers with the combination of skills and experience to unravel how non-conventional yeast can be successfully implemented in a biotechnology industry. Besides, the Action will gather European top scientists in the field and thus become an important pillar worldwide. Participants will be given the opportunity to network and collaborate which otherwise will be limited. Furthermore, with the help of the Action, European scientists will set the future standards for research on non-conventional yeasts.

https://yeast4bio.eu/

Interactive Narrative Design for Complexity Representations

CHAIR: Prof Hartmut Koenitz (NL) hkoenitz@gmail.com
FUNDING PERIOD: December 2019 – December 2023

SUMMARY

The aim of this COST action is to build a network for the interdisciplinary study of the potential interactive digital narrative has as a means to addressing complexity as a societal challenge by representing, experiencing and comprehending complex phenomena and thus also address the issue of "fake news". The challenge therefore is to change IDNs current status from 'singular achievement' of a small group of 'initiated' practitioners to 'general practice' of many media companies. The INDCOR project (Interactive Narrative Design for COmplexity Representations) addresses this challenge by means of a coordinated effort in analysing and generalising design and production methods of stand-out IDN works with a particular focus on the representation of complex issues.

Multi3Generation: Multi-task, Multilingual, Multi-modal Language Generation

CHAIR: Dr Anabela Barreiro (PT) anabela.barreiro@inesc-id.pt
FUNDING PERIOD: September 2019 – September 2023

SUMMARY

Language generation (LG) is a crucial technology if machines are to communicate with humans seamlessly using human natural language. A great number of different tasks within Natural Language Processing (NLP) are language generation tasks, and being able to effectively perform these tasks implies 1) that machines are equipped with world knowledge that can require multi-modal processing and reasoning (e.g. textual, visual and auditory inputs, or sensory data streams), and 2) the study of strong, novel Machine Learning (ML) methods (e.g. structured prediction, generative models), since virtually all state-of-the-art NLP models are learned from data. Moreover, human languages can differ wildly in their surface realisation (i.e. scripts) as well as their internal structure (i.e. grammar), which suggests that multilinguality is a central goal if machines are to perform seamless language generation. Language generation technologies would greatly benefit both public and private services offered to EU citizens in a multilingual Europe and have strong economic and societal impacts.

https://multi3 generation.eu/

Mathematical models for interacting dynamics on networks

CHAIR: Prof Marjeta Kramar Fijavz (SI)
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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Many physical, biological, chemical, financial or even social phenomena can be described by dynamical systems. It is quite common that the dynamics arises as a compound effect of the interaction between sub-systems in which case we speak about coupled systems. In this action we shall study such interactions in particular cases from three points of view: the abstract approach to the theory behind these systems, applications of the abstract theory to coupled structures like networks, neighbouring domains divided by permeable membranes, possibly non-homogeneous simplicial complexes, etc., modelling real-life situations within this framework. The purpose of this Action is to bring together leading groups in Europe working on a range of issues connected with modelling and analyzing mathematical models for dynamical systems on networks. We aim to develop a semigroup approach to various (non-)linear dynamical systems on networks as well as numerical methods based on modern variational methods and applying them to road traffic, biological systems, and further real-life models. We also explore the possibility of estimating solutions and long time behaviour of these systems by collecting basic combinatorial information about underlying networks.

http://www.mat-dyn-net.eu

European Network for Innovative Diagnosis and Treatment of Chronic Neutropenias

CHAIR: Prof Helen Papadaki (GR) e.papadaki@uoc.gr

FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Chronic neutropenias (CNP) represent a wide spectrum of disorders ranging from mild to life-threatening, acquired or congenital diseases. The pathophysiological mechanisms underlying CNPs are diverse and vary from haemopoietic stem cell and bone marrow microenvironment defects resulting in impaired neutrophil production, to immune disturbances leading to accelerated apoptosis of neutrophil progenitors and/or the circulating mature neutrophils. The prognosis of patients with CNP is related to the underlying pathogenesis, the degree of neutropenia and the propensity for leukaemic transformation. Accurate diagnosis is mandatory for risk stratification and treatment choice. The principal challenge of the Action is to establish a wide network of researchers with special interest in CNPs and facilitate interactions and collaborations among top-level European experts and young investigators from different scientific areas i.e. Clinical and Laboratory Haematology, Immunology, Genetics, Molecular Biology and Regenerative Medicine. The main aims of the Action are: a) to promote science, training and education on advanced biochemical, immunological, genetic and molecular biology techniques for the accurate diagnosis and treatment of patients with different types of CNP, early recognition of Myelodysplastic Syndromes/Acute Myeloid Leukaemia evolution and appropriate intervention, b) to link and further expand existing neutropenia networks for a more multidisciplinary approach of CNP that will result in a better characterization of the underlying diseases and development of individualized and precision medicine therapeutic approaches for selected patients, c) to organize and expand CNP patient Registries and Biobanks using homogenized protocols in line with the ethical standards of the European Legal Framework and the relevant national regulations.

http://www.eunet-innochron.eu

Computational materials sciences for efficient water splitting with nanocrystals from abundant elements

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FUNDING PERIOD: November 2019 – November 2023

SUMMARY

Modern society in Europe needs a source of energy that is generated without harming the environment. The efficiency of renewable energy converting devices such as water splitting with electrochemical cells based on nano-scaled oxides relies on a sensible choice of material components. However, larger scale material and device properties such as interface segregation, grain boundary movement, ionic diffusion through porous materials, and mechanical loading also strongly impact performance, making the theoretical simulation of realistic devices a challenging multi-scale problem. Although our scientific community has developed expertise in the individual modelling fields, much less effort has been devoted to integrating and combining the scales toward a multi-scale approach. The ultimate central challenge will be to generate a multiscale modelling platform that will be used world-wide for conducting state-of-the-art multi-scale property prediction of materials. This Action intends to focus on bridging the knowledge gaps between different theoretical methods and computer codes in order to facilitate the discovery of novel materials for energy conversion. The objectives of this challenge include building an organized network of European scientists working on achieving greater scientific understanding of water splitting and developing approaches for reliable and realistic multi-scale modelling of nano-oxides material architectures. This Action will also develop initiatives to train young scientists, as well as inform computational users throughout the development and production. The longer-term outcome will be the faster achievement of more environmentally friendly energy technologies which has an immeasurably large impact and benefit for society.

https://comp-h2o-split.eu/

PROfiling the atmospheric Boundary layer at European scale

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FUNDING PERIOD: October 2019 – October 2023

SUMMARY

The atmospheric boundary layer (ABL) is the layer closest to the Earth's surface within which most human activities take place. The vertical profile of atmospheric thermodynamic parameters in the ABL impact weather, air quality, and climate. Surface sensor networks and satellite observations do not provide sufficient information on the high temporal variability and strong vertical gradients experienced in the ABL. Thus, despite its importance, ABL remains the single most important under-sampled part of the atmosphere. This observational gap currently hampers our ability to improve weather forecasts, air quality prediction, and climate model parameterization. However, this gap is mainly due to the lack of S&T networking and coordination. In fact, state-of-the-art ground-based remote sensing instruments able to provide ABL profiles (such as temperature, humidity, wind, aerosol, cloud) are currently deployed at numerous sites in Europe, but the harmonization of data and procedures is missing, limiting the effective use and societal benefits of the existing ABL profiling data. This Action aims to fill this gap, bridging user needs and the S&T expertise residing in industry and academia. This will be achieved through:

- Capacity building of instrument operators to improve the use of state-of-the-art ABL profiling instruments;
- Fostering coordination between operational agencies and academia to tailor measurement networks for well identified applications;
- Enhancing pan-European research coordination to develop new products and tools for data assimilation and long-time series reanalysis;
- Identifying knowledge brokers enabling rapid exchange between academia, operational agencies, industry and end-users to ensure full exploitation for societal benefit.

http://www.probe-cost.eu/

Multi-disciplinary innovation for social change

CHAIR: Dr Katri-Liis Lepik (EE) kllepik@tlu.ee

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

In an increasingly complex and rapidly changing world, traditional disciplinary approaches to the framing and resolution of social and economic problems deliver ever diminishing returns. Discussions abound, therefore, about how best to educate and prepare graduates for the fresh challenges of the 21st century. Knowledge Alliances between Higher Education Institutions (HEIs) and enterprises which aim to foster innovation, entrepreneurship, creativity, employability, knowledge exchange and/or multidisciplinary teaching and learning are therefore becoming increasingly necessary and relevant. The challenge is to determine what we should teach in the future and how it should be taught. The changing nature of contemporary society highlights that social issues are often highly complex and multifaceted. The aim of this Action is to demonstrate, through the adoption of Multi-Disciplinary Innovation (MDI) methods, how we can respond to social problems with a design-led approach which has a problem-oriented ethos, supporting positive social change and the development of international public policy discourse. It will be achieved through the establishment of a Pan-European Public Sector Innovation (ePSI) lab. It will prepare students for roles in employment by integrating education programmes into the lab's operations and it will support agencies that have a role in responding to and developing public policy.

https://socialchangelab.eu/

European Soil-Biology Data Warehouse for Soil Protection

CHAIR: Dr David Russell (DE) david.russell@senckenberg.de

FUNDING PERIOD: September 2019 – September 2023

SUMMARY

European authorities and stakeholders urgently need reliable tools for monitoring and evaluating the environmental condition of soils within policy assessment in context of numerous EU directives. The focus of the EUdaphobase Action is on creating the structures and procedures necessary for developing an open Europe-wide soil biodiversity data infrastructure. The ultimate goal of EUdaphobase is to establish a pan-European soil-biological data and knowledge warehouse, which can be used for understanding, protecting and sustainably managing soils, their biodiversity and functions. A focal approach is to combine available soil bioita's distributional & trait data with indispensable environmental metadata to gain insight into functional relationships in soils and to predict the state of ecosystem services (ESS). The activities follow an information flow from data providers to users of assessment tools. The data warehouse will host and allow open sharing of data. Intermediate in the project is developing standardized terminologies, data quality-control protocols and ecological traits used as proxies for soil ESS. The Action will curate, harmonize, quality check and standardize existing data according to protocols agreed upon during the Action. Innovative procedures to operationalize assessments of the state of soil concerning biodiversity and ESS will be offered. For this, specific analytical tools will be developed for applied uses of policy, management and regulatory agencies. These tools will recognize and visualize (i.e. on maps) functional biological characteristics of soils related to type, use and management practices as well as determine and delineate ecosystem services, baselines, relationships and set the basis for forecasting changes.

https://eudaphobase.eu

European transdisciplinary networking platform for marine biotechnology

CHAIR: Dr Ana Rotter (SI) ana.rotter@nib.si

FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Marine organisms produce a vast diversity of primary and secondary metabolites with antibacterial, antifungal, anticancer, analgesic, anti-inflammatory, nutritional, photoprotective activity or other beneficial properties. The exploitation of marine bioresources and the valorisation of their natural products are encompassed by the burgeoning field of marine biotechnology, which is a high priority for the successful implementation of Blue Growth and Bioeconomy strategies within the EU. Marine biotechnology contributes to achieving 14 out of 17 UN sustainable development goals. While the demand for alternative sources of food, drugs and chemicals is increasing, the sea and its vast biota remain largely underexplored and unexploited. Despite the short history marine organisms delivered close to 30,000 natural products, many more awaiting to be discovered. This implies a strong need for enhanced transdisciplinary collaborations within scientific fields and multisectoral collaboration where citizens, researchers, policy makers, industrial and societal actors can work together. The overall aim of Ocean4Biotech is to bring together experts in the field of marine biotechnology, to provide a platform for sharing experience, knowledge and technologies, and to design a roadmap for a more efficient and rapid development of marine biotechnology research in Europe and beyond. To best of our knowledge, such a large, diverse and geographically dispersed network of experts in marine biotechnology does not exist. Since marine biotechnology is still in its infancy, we believe this is the optimal timing to create this efficient, operational, motivated, inclusive and sustainable network with a serious and ambitious commitment for proactive dissemination and science communication activities.

Conservation of freshwater mussels: a pan-European approach

CHAIR: Prof Tadeusz Zając (PL) tzajac@iop.krakow.pl
FUNDING PERIOD: October 2019 – October 2023

SUMMARY

Freshwater bivalves are a large, diverse and important group, since they can dominate in some habitats in terms of quantity and biomass. At the same time they are among the World's most imperilled taxonomic groups. Studies on freshwater bivalves' ecology and conservation provide the ground for inter- and trans-disciplinary research and innovation, integrating knowledge into practice of freshwater protection. Freshwater bivalves provide crucial ecosystem functions and services such as water purification or nutrient cycling, thus can be used as nature-based tools for improving ecosystem functions and services as well as indicators of ecosystem health. Through development of international cooperation of scientists from various fields within and outside biological sciences, with participation of administration and NGO sector, we want to draw the full picture of freshwater mussels biodiversity crisis in Europe and develop scientific basis to halt the loss of biodiversity and ecosystem services mediated by these organisms.

https://confremus.eu/

ADHEsion GPCR Network: Research and Implementation Set the path for future Exploration

CHAIR: Dr Simone Prömel (DE) proemel@hhu.de

FUNDING PERIOD: November 2019 – November 2023

SUMMARY

This Action aims to promote, stimulate and translate research on Adhesion-G protein-coupled receptors (aGPCRs) 'from bench to bedside' in Europe. Adhesion-GPCRs are a class of structurally and functionally highly intriguing cell surface receptors with essential functions in health and disease, which have remained understudied for a long time and thus, display a vastly unexploited pharmacological potential. Only the past years have seen an increase in efforts to unravel the mysteries of this enigmatic family of GPCRs. Scientists as well as clinicians from different fields with divergent expertise and interests begin to recognise the relevance of aGPCRs and get involved into aspects of aGPCR research. As a consequence, the community is young, only just forming and not well organised. The Action will assemble this community to increase the awareness of fellow scientist and the interaction between them so that their separate efforts and methods can be complemented. Especially Early Career Investigators (ECIs) who represent a great proportion of the community but most of the time lack the means to interact, will be encouraged and integrated to ensure the development of novel ideas and the long-term progress of the field. To achieve this goal the Action will establish a network of dedicated non-tenured ECIs, clinicians and representatives of pharmaceutical companies, provide communication platforms and opportunities to interact. This will lead to a more focused approach to tackle the most pressing scientific questions in the field and will help bridging the gap between fundamental research and therapeutic innovation.

COST Actions starting in 2018
(and finishing in 2022)

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CA17101			■				194
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CA17106	■	■					199
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CA17110				■			203
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COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
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CA17123	■	■					216
CA17124	■						217
CA17125					■		218
CA17126	■	■					219
CA17127	■				■		220
CA17128	■	■		■			221
CA17129	■		■				222
CA17130	■		■				223
CA17131	■					■	224
CA17132					■	■	225
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CA17134	■						227
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CA17138			■				231
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European Network on Pseudomyxoma Peritonei

CHAIR: Prof Kjersti Flatmark (NO)
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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Pseudomyxoma peritonei (PMP) is a rare abdominal cancer originating in the appendix, causing extensive tumour growth in the peritoneal cavity. Although rare, PMP still dramatically affects the lives of almost 4,000 new patients in Europe every year, posing a huge financial and logistical challenge for healthcare providers. If complete surgical removal cannot be accomplished at expert centres, the prognosis is very poor, and no other effective treatments are currently available. Because it is a rare disease, research into the pathogenesis, classification, molecular composition and treatment of PMP has been fragmented and challenging. The EuroPMP Action aims to sculpt a new, collaborative landscape within PMP research by creating a strong and capable network of experts from many fields, including surgeons, pathologists, oncologists, radiologists, molecular biologists, bioinformaticians and allied healthcare professionals. The Action will work towards a cure for PMP by facilitating collaborative research projects, sharing and dissemination knowledge, and improving standards of care for the thousands of patients afflicted with PMP.

https://europmp.eu/

Police Stops

CHAIR: Prof Sofie De Kimpe (BE) sofie.de.kimpe@vub.be

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Stop and search (S&S) is a practice carried out by the police worldwide which enables police officers to stop a person, prevent him or her from pursuing his or her passage (Bowling & Philips, 2007; Bowling & Weber, 2011) and, if necessary, proceed with a search. Two types of S&S approaches can be distinguished: the reactive approach, whereby the police decide to stop someone as a response to suspicious behaviour or circumstances in order to find proof of criminal activity, and the proactive approach, where the goal is to deter future offences and maintain public order (Murray, 2014). The latter fits well within the current 'culture of control' which aims to identify suspicious individuals as soon as possible (Van der Leun & Van der Woude, 2011). In various European countries, S&S has been a source of considerable debate. It is argued that S&S principally targets certain population groups and more specifically ethnic minority groups (ethnic profiling) and young people (Delsol & Shiner, 2006; Sollund, 2006). Consequently, S&S is a rather controversial practice that can have a negative effect on the public and can impact the legitimacy of the police (Bowling & Phillips, 2007; Van der Leun et al., 2014; Quinton, 2013). Despite the intense debates currently taking place about S&S in Europe, no cross-country scientific research has been carried out on the practice to date. Therefore, the main aim of this Action is to exchange and deepen our knowledge and understanding of police stops in Europe.

https://polstops.eu/

Delivery of Antisense RNA Therapeutics

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Antisense oligonucleotides (ASOs) refer to a new class of drugs that, through very specific targeting, could correct genetic defects in rare inherited diseases, modulate autoimmune or neurodegenerative diseases, or target tumours or viruses. However, only a few such drugs are currently on the market and they have proved less effective than expected. The main challenge to their efficacy seems to be their deficient delivery to target tissues. However, while translational research on ASO is surging ahead, very little is known about the mechanisms by which ASOs are taken up by different tissues and specific cells. As regards delivery, the ASO field is fragmented, with researchers in academia and industry working in isolation on specific diseases, and generally focusing on therapeutic effects in target tissues. The main aim of the DARTER Action is to use networking and capacity building in the field of nucleic-acid therapy delivery to enable RNA-targeting nucleic-acid drugs to reach their full potential and become a mainstream therapeutic option. DARTER will operate through three working groups pursuing research objectives (delivery strategies, model systems, safety and toxicology) and one capacity-building group (stakeholder communication). The goal of the latter is to achieve consensus on protocols and the assessment of ASO delivery and toxicology and to train new researchers within a cooperative research framework. The DARTER COST network will include participants from COST countries and several international partners, including academics, industrial partners, patient representatives and clinicians, and is also open to other interested stakeholders.

New diagnostic and therapeutic tools against multidrug resistant tumors

CHAIR: Prof Chiara Riganti (IT) chiara.riganti@unito.it
FUNDING PERIOD: September 2018 – September 2022

SUMMARY

This Action will build the first multidisciplinary network, including academic laboratories, research institutes and small and medium-sized enterprises (SMEs), with a wide range of excellent and non-overlapping expertise, aiming to improve the diagnosis and therapy of multidrug resistant (MDR) solid tumours. Until now, knowledge of biomarkers and therapeutic tools used against MDR tumours has been fragmented. There are no algorithms which are predictive/diagnostic of MDR tumours ex-ante; and all previous therapies against MDR tumours have failed. The key challenge of this Action is to fill these gaps by producing a comprehensive, open and user-friendly platform of knowledge on MDR tumours, identifying new diagnostic/predictive biomarkers, and producing new and safe compounds applicable to personalised treatments of MDR tumours. Up to 70% of solid tumours are resistant to diagnosis, which means poor quality of life quality and prognosis for patients and high management costs for European healthcare systems. This Action is working to improve diagnosis and treatment of patients with MDR tumours and to reduce the cost of their management. Further, by creating fruitful collaborations between basic and industrial research, we will stimulate the creation of new start-ups and SMEs in Europe. Finally, the Action aims to raise the level of European research on MDR, reducing the disparity in the research quality between EU countries and ITC, and providing the necessary training for European early career investigators to develop as future independent research leaders, regardless of location, age or gender.

https://stratagem-cost.eu/

A pan-European Network for Marine Renewable Energy

CHAIR: Dr Vicky Stratigaki (BE) vicky.stratigaki@ugent.be

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

The pressure of climate change and the growing energy demand has increased interest in marine renewable energy resources, such as wave energy which can be harvested through wave-energy converter (WEC) arrays. However, the wave energy industry is currently at a significant juncture in its development, facing a number of challenges which require research to refocus on the techno-economic perspective, whereby the economics take into account the full life-cycle costs of the technology. It also requires the development of WECs suitable for niche markets, because in Europe there are inequalities regarding wave-energy resources, wave-energy companies, national programmes and investments. As a result, Europe has both leading and non-leading countries in wave-energy technology. The sector also needs to increase the confidence of potential investors by reducing (non-)technological risks. This can be achieved through an interdisciplinary approach by involving engineers, economists, environmental scientists, legislation and policy experts, etc. Consequently, the wave-energy sector must be given the necessary attention compared to other more advanced and commercial ocean-energy technologies (e.g. tidal and offshore wind). The formation of the first pan-European network on an interdisciplinary marine wave-energy approach will contribute to the deployment of large-scale WEC arrays by dealing with the current bottlenecks. The WECANet Action is aiming for a collaborative approach by providing a strong networking platform that can also create the space for dialogue between all wave energy stakeholders. WECANet's main target is equal research, collaboration and funding opportunities for all researchers and professionals, regardless of age, gender and location.

https://www.wecanet.eu/

Mobilising Data, Policies and Experts in Scientific Collections

CHAIR: Dr Dimitrios Koureas (NL)
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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

European natural science collections host approximately 1.5 billion biological and geological objects, which represent about 80% of the known current and past biological and geological diversity on earth. The scope of this MOBILISE Action is to foster a cooperative network in Europe to support excellent research activities and facilitate knowledge and technology transfer around natural science collections. This will prepare the ground for a future pan-European Distributed System of Scientific Collections. Technical innovations, such as next-generation sequencing and large-scale digitisation, including 3D imaging, increase the volume of research data rapidly. Strategies and protocols for sustainable data storage and availability have to be adjusted accordingly. Current changes in legislation (e.g. (EU) No 511/2014) increase the need for the traceability of genetic resources and for practical tools to document specimens in collections. Technical solutions have been developed to provide scientific collections as digital data, but they need to scale up and evolve from isolated project-based solutions in individual institutes to pan-European industry solutions targeted to rapidly changing societal needs, embedded in long-term sustainable structures. MOBILISE will: 1) facilitate the transfer of knowledge and technology between researchers, domain specialists, data aggregators and industry through networking activities, events, workshops and trainings ('open to the world'); 2) promote the development of innovative techniques and coordinated prioritisation to increase the efficiency of large-scale collection digitisation and mobilisation ('open innovation'); and 3) raise awareness of the need in science and society for, apart from physical access, sustainable data access infrastructures as an integral component of biodiversity research ('open access').

https://www.mobilise-action.eu/

European Network to connect research and innovation efforts on advanced Smart Textiles

CHAIR: Dr Ariadna DETRELL DOMINGO (SP)
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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

The aim of the COST CONTEXT Action is to create a network of European researchers and main relevant stakeholders to develop joint ideas and initiatives which can be turned into advanced smart textile products. A smart textile material is a "functional textile material which interacts actively with its environment, i.e. it responds or adapts to changes in the environment". They find applications in all sectors and especially in health and medical, automotive and aeronautic, personal protective equipment, sports and wearables, and buildings and interior design. Although several R&D projects have been carried out in this field in recent years, most of the prototypes developed have not reached the market for many reasons, such as product reliability, production economies, and the absence of a demonstrated use case and/or value proposition. In that sense, CONTEXT is aiming to ignite research and innovation projects (with outputs with high technology readiness levels expected) by bringing together in the same network and through working groups people with the right competencies and experience from the academic and research fields, the industrial sector and from clusters. The Action will promote the development of a joint research roadmap for smart textiles, foster the transfer of knowledge among different actors in order to find suitable applications in various multidisciplinary fields, act as a stakeholder platform to identify needs and requirements from different points of view in a bottom-up approach, and will promote networking activities to attract talent, build more and better research projects with greater awareness of the objectives of creating exploitable results.

http://www.context-cost.eu/

Aedes Invasive Mosquitoes

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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

In tropical areas, Aedes mosquitoes cause >100 million symptomatic cases/year of viral diseases, such as dengue, yellow fever, chikungunya and Zika fever, and thousands of deaths. With increasing trade and travel, several Aedes species have been introduced into Europe and are now spreading spectacularly rapidly and becoming a widespread significant public health risk which must be effectively addressed, as testified by recent cases of autochthonous chikungunya and dengue transmission. Transboundary risks need effective surveillance, risk assessment and vector control, with an efficient dissemination of information and guidance to stakeholders, requiring collaboration between the normative, research, public health, commercial and civil society sectors at international, national and local scales. This is not happening. Despite the range of institutional guidelines available, current mitigation activities are largely uncoordinated, and implemented piecemeal nationally or locally, reducing cost-effectiveness and impact. The AIM COST Action will build a gender, age and geographically balanced network from critical stakeholder sectors. It will assess and review current surveillance, control and analysis practices, and develop best practice guidelines and protocols ensuring consistency across Europe. It will facilitate the development of new tools and identify priority research topics. Recommendations for standardising and streamlining entomological and spatial analysis will promote the enhanced risk assessments needed for reliable targeting and planning. Critical elements maximising impact will be involvement of civil society and citizen scientists, as well as collaborative dissemination to ensure that technical outputs and guidelines are customised at different geographical scales for each operational stakeholder group. Lessons learned will be transferrable to other emerging vector-borne diseases worldwide.

http://www.aedescost.eu/

Understanding and modeling compound climate and weather events

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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Hazards such as floods, wildfires, heatwaves and droughts usually result from a combination of interacting physical processes that occur across multiple spatial and temporal scales. The combination of physical processes leading to an impact is referred to as a 'compound event'. Examples of high-impact compound events include: 1) droughts, heatwaves, wildfire and/or air pollution and their interactions involving a complex interplay between temperature, humidity and precipitation; 2) extreme precipitation, river discharge and storm-surge interactions, combining coastal storm processes with fluvial/pluvial and ocean dynamics; and 3) storms, including the clustering of major events leading to spatial and/or temporal dependence. Climate change alters many of these processes and their interaction, making projections of future hazards based on single-driver analyses difficult. Impact studies considering only one driver usually fail to assess the extent of the impacts of compound events. Thus, it is not clear whether climate models can capture major changes in risks associated with compound events. Existing modelling approaches used to assess risk may therefore lead to serious maladaptation. DAMOCLES will: a) identify key process and variable combinations underpinning compound events; b) describe the available statistical methods for modelling dependence in time, space and between multiple variables; c) identify data requirements needed to document, understand and simulate compound events; and d) propose an analysis framework to improve the assessment of compound events. DAMOCLES brings together climate scientists, impact modellers, statisticians and stakeholders to better understand, describe and project compound events, and foresees a major breakthrough in future risk assessments.

http://damocles.compoundevents.org

Standardizing output-based surveillance to control non-regulated diseases of cattle in the EU

CHAIR: Dr Inge Santman-Berends (NL)
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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Several countries have implemented programmes to control non-regulated cattle diseases in the European Union, making it difficult to compare the confidence of freedom for cattle originating from different countries. To facilitate safe trade, support is needed to develop transparent methods that enable comparisons to be made of outputs of surveillance, control or eradication programmes. In the SOUND-control Action, five working groups will develop a generic and joint understanding about the requirements and characteristics needed for proof of freedom and subsequent cost-effectiveness, regardless of heterogeneities in the underlying data. The Action will coordinate, stimulate and assist with initiatives to explore and implement a widely adaptable, output-based framework to substantiate confidence of freedom from infection and assess epidemiological and economic equivalence of control efforts. The working groups will describe current control programmes, provide requirements for an output-based framework, evaluate data availability and assess available and innovative methods for objective and standardised output-based comparison. With the new Animal Health Law, it is anticipated that disease control will progressively change towards output-based approaches. SOUND-control will support this law by providing requirements and demands for a single general regulatory framework, adaptable to multiple diseases, which aims to enhance the safety of trade. Although its primary focus concerns non-regulated diseases, the outcomes of this work will be applicable to regulated diseases in the EU, which are currently underpinned by input-based standards.

http://www.sound-control.eu/

Data integration to maximise the power of omics for grapevine improvement

CHAIR: Prof Mario Pezzotti (IT) mario.pezzotti@univr.it

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

The COST Action INTEGRAPE will bring together all stakeholders in the grapevine research community (academic, industry, policymakers and consumers) in an open, international and representative network to develop minimal data standards and good practices in order to integrate data repositories and improve interoperability between datasets. The ultimate objective is to harness and exploit all available data to achieve better management practices and more cost-effective breeding for improved genotypes. Grapevines are grown worldwide to produce fresh berries, processed fruits and wine. The major challenge is to control berry composition and maintain yields while limiting the use of pesticides, water and other inputs, thereby adapting the industry to climate change while achieving environmental and economic sustainability. Grapevine research focuses on interactions between the genotype, phenotype and environment, and information must be integrated from heterogeneous datasets, including ampelography, environmental biology, genetics, genomics, epigenomics, transcriptomics, proteomics and metabolomics. The data are currently dispersed and difficult to access, hindering meta-analysis (the reuse of grapevine data beyond the original experiments). No institution working in the field of grapevine research has yet taken on the mission to improve data integration and interoperability at the global level, although the grapevine research community is continuously producing large datasets. The concepts described will support stakeholders by developing innovative strategies to integrate grapevine data from existing resources and new experiments in a cost-effective way, as well as making interoperable grapevine datasets and tools available in a secure and standardised format.

http://www.integrape.eu/index.php

Prospective European Drug-Induced Liver Injury Network

CHAIR: Prof Raul Andrade (SP) andrade@uma.es

FUNDING PERIOD: October 2018 – October 2022

SUMMARY

There is a clear unmet need for a deeper understanding of idiosyncratic drug-induced liver injury (DILI), a multilayered challenge that spans the life of the drug from preclinical development to clinical trials and post-marketing. The aim of the PRO-EURO-DILI-NET COST Action is to create a unique, cooperative, interdisciplinary, European-based DILI network of stakeholders to coordinate efforts in DILI, to facilitate bidirectional exchange of discovered knowledge and generated hypotheses among different disciplines, and to promote clinically impactful knowledge discovery and its translation into clinical practice. This Action will: 1) harmonise efforts towards in-depth DILI phenotyping and a bio-sample repository and coordinate pre-funded database/repository studies to aggregate a large number of DILI cases in a standardised manner (WG1); 2) establish a strategy for development, validation and performance of DILI novel biomarkers and explore multifactorial DILI risk modifiers in clinical datasets using novel approaches for future precision medicine (WG2); 3) facilitate clinically impactful knowledge discovery by introducing biological variations and their complexity (i.e. multi-cellular/multi-organ systems) into toxicological experiments to assess hepatotoxicity to guide future drug safety testing (WG3); 4) define criteria and establish end points to measure efficacy on novel interventions in DILI (WG4); and 5) draft policy recommendations about near-patient testing tools. The network will promote and coordinate a highly translational and innovative research programme in Europe and beyond with the ultimate goal of pre-empting and preventing DILI, developing innovative therapeutic approaches that could improve clinical outcomes and enhancing public awareness, while developing a forum for knowledge exchange and training young European researches.

https://proeurodilinet.eu/

Trapped Ions: Progress in classical and quantum applications

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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

In recent years, ion traps have developed from a topic of fundamental research into a versatile tool for a wide range of research topics and quantum technologies. With the ability to isolate the ions from their environment, atomic and molecular ions can now be studied in unparalleled detail. This capability has led to important scientific progress in fundamental research, such as the measurement of cold collisions between trapped ions and cold atomic or molecular particles, the study of the interaction of light with trapped ions, or mass measurements with ultra-high precision. Beyond purely fundamental research, ion traps have become indispensable for many applications and technologies. Trapped ions are currently the most promising implementation of quantum information processing devices where many essential building blocks have been developed in recent years; magnetic field sensing with high sensitivity has been demonstrated and some of today's best atomic clocks are based on atomic ions. These applications have the potential to revolutionise many aspects of our daily life. The aim of this Action is to enhance the current applications of trapped ions by supporting Europe-wide collaborations and knowledge exchange, and to enable these technologies to be taken a step further towards their commercialisation.

https://www.iontraps.eu/

Transdisciplinary solutions to cross sectoral disadvantage in youth

CHAIR: Prof Anu Toots (EE) anuto@tlu.ee

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

This COST Action aims to understand the interrelationship between disadvantages that young people across Europe face in the process of entering adulthood and how policies can mitigate this negative spillover effect. Specifically, we are interested in sets of circumstances and factors that prevent young people from: finding a decent job; starting a family when they want to; and making their voices heard in the policy process. The scientific challenge addressed by the proposed Action is to build awareness and mutual usability of research findings across research disciplines and societal contexts. This understanding is especially important due to the fact that life domains are interrelated and disadvantages in one domain may cause negative spillover effects in another. Based on transdisciplinary knowledge on disadvantages, it is possible to propose relevant policy interventions to tackle such situations and eventually to reduce the risk of social exclusion. The focus is on the cross-sectoral youth policy and investment approach in social policy which represent two efforts in finding novel solutions to contemporary concerns. Yet the problem is that both are taken for granted as good solutions for youth without further in-depth investigation. The Action sees its societal challenge in understanding how the approach to social investment and relevant policy interventions can be applied to young people without bringing about greater inequality.

https://young-in.eu/

European network for advancing Electromagnetic hyperthermic medical technologies

CHAIR: Dr Lourdes Farrugia (MT)
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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Electromagnetic (EM) hyperthermic technologies hold great potential for the treatment of diseases, especially for cancers that are resistant to standard regimens. These technologies modify tissue temperature: hyperthermia heats the diseased tissue to make it susceptible to treatment and ablation heats the tissue until it is destroyed. Hyperthermia is particularly effective in the treatment of cervical and breast cancer, head and neck cancers, sarcoma in adults, and germ cell tumours in children; while radiofrequency and microwave ablation offer promise for treating liver, kidney, and lung cancers. Overall, these techniques have shown significant potential and there is substantial opportunity to solidify their use clinically and to apply them to a wider range of medical conditions. However, underpinning the development of these techniques is the need for accurate knowledge of the dielectric and thermal properties of tissues, which provides the foundation for these technologies and de-risks the technical challenge before commercialisation. Furthermore, contributing to the stagnant market in EM hyperthermic medical devices is the fact that researchers working on the development of medical technologies are often not fully aware of, and not trained to address, the clinical and commercialisation challenges facing novel medical devices. To address these challenges, the MyWAVE Action takes a holistic approach by bringing together key players in the field of dielectric spectroscopy, translational research and medical professionals. Conjoining these varied communities into one collaborative network is critical to advance the design, development and commercialisation of EM hyperthermic technologies so that they can reach patients faster and improve treatment outcomes.

https://www.um.edu.mt/projects/mywave/

International Network for Translating Research on Perinatal Derivatives into Therapeutic Approaches

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Stem cells hold great promise in the evolving field of regenerative medicine, and there are many sources from which they can be obtained. Over the past decade, different perinatal (Pn) tissues have been shown to harbour a vast array of stem cells with therapeutic potential. This relatively new field of research is rapidly expanding and its relevance is supported by the recent emergence of clinical trials in Europe and worldwide. There are, however, many issues that need to be addressed to ensure optimal research outcome and clinical experimentation data interpretation. These issues range from the need to reach a consensus on nomenclature and optimal techniques for isolation, characterisation and cryopreservation, to more advanced issues such as collating data and expertise towards the understanding and exploitation of the mechanisms and therapeutic actions of perinatal derivatives. It is also necessary to identify gaps in knowledge and how collaborative research can address these. Therefore, this COST Action will unite a currently fragmented critical mass of academic, clinical and industry expertise to enhance both the basic understanding and translational potential of perinatal derivatives. The Action will develop a platform for the exchange of concepts, methods and training for young researchers.

https://www.sprint-cost.org

Towards an International Network for Evidence-based Research in Clinical Health Research

CHAIR: Prof Hans Lund (NO) hans.lund@hvl.no

FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Redundant clinical research has been published due to the absent use of systematic reviews (SR) when new research is planned. It is unethical, limits the available funding for important and relevant research, and diminishes the public's trust in research. To raise awareness of this inappropriate practice, the EVBRES consortium defines 'evidence-based research' (EBR) as the use of prior research in a systematic and transparent way to inform a new study so that it answers the questions that matter in a valid, efficient and accessible manner. New studies should be informed by SRs as to the most appropriate design and methods. EVBRES will establish an international European-based network aiming to raise awareness of the need to use of SRs when planning new studies and placing new results in context. PhD students and senior clinical researchers need to learn how to find, critically appraise and update a SR, answering the same clinical questions as the new study plans to answer. Closely related to this is the involvement and awareness of related stakeholders, including patients, ethics committees, funding agencies and scientific journals, to require SRs before approval of new clinical studies. By acknowledging and implementing an EBR approach, these stakeholders can improve their own practice and can increase the incentives for clinical researchers to use an EBR approach. Further, the EVBRES Action will catalyse more efficient updating and production of SRs, and monitor the implementation of an EBR approach both in clinical research and among related stakeholders.

https://evbres.eu/

Identifying Biomarkers Through Translational Research for Prevention and Stratification of Colorectal Cancer

CHAIR: Dr Sergi Castellvi-Bel (SP) sbel@clinic.cat
FUNDING PERIOD: October 2018 – September 2022

SUMMARY

This Action aims to use innovative translational research to identify colorectal cancer biomarkers for personalised medicine that will improve screening, early detection and disease follow-up, and attain better tumour profiling, state-of-the-art functional characterisation of genetic variants and new therapy approaches. It will be organised in the following working groups: 1) Disease risk profiling applied to the optimisation of current screening programmes. Germline predisposition variants, environmental factors, epigenetics, microbiome and metabolomics biomarkers will be used to better select patients eligible for screening; 2) Non-invasive biomarkers for early detection and disease follow-up. Circulating tumour cells, circulating tumour nucleic acids, tumour-educated platelets and exosomes will be explored to identify new tools for early detection and monitoring of the disease; 3) Tumour profiling to identify biomarkers with prognostics and predictive values for patient stratification. Intra-tumour heterogeneity will be considered and tumour mutational profiling, epigenetics, single-cell genomics sequencing used as instruments to better inform tumour and precursor lesion characterisation; 4) Functional genomics and new therapies. Candidate genetic variants will be validated and routes to novel therapies for this disease will be conceived. To do so, cutting-edge approaches such as CRISPR-Cas9 and immunotherapy will be applied. The network will bring together participants from different COST countries and facilitate research interaction and collaboration between research groups and enterprises interested in the described objectives. Diverse expertise includes clinical practice, germline and somatic genetics, epigenetics, bioinformatics, cell and molecular biology, microbiology, immunology, biostatistics, epidemiology, health economy and the industrial sector.

https://www.transcoloncan.eu

EU Foreign Policy Facing New Realities: Perceptions, Contestation, Communication and Relations

CHAIR: Prof Michele Knodt (DE) knodt@pg.tu-darmstadt.de

FUNDING PERIOD: October 2018 – October 2022

SUMMARY

EU foreign policy is experiencing unprecedented turbulence which is putting key achievements of the European integration project at risk. Externally, the EU's global environment is characterised by the reconfiguration of power, growing divisions, and the contestation of established liberal order. Simultaneously, the EU's neighbourhood is increasingly conflict prone and unstable, triggering migration flows and the proliferation of illiberal values. 'Domestically', the EU is facing severe internal conflicts, marked by austerity, Brexit, growing nationalism, populism and new protectionism. The ENTER Action aims to improve our understanding of the central properties of EU foreign policy in light of these new realities, focusing on perceptions, communication and contestation. In today's world, the success of EU foreign policy depends on the EU's ability to instantaneously respond to stimuli and pressures originating at both the international and the intra-EU levels. Linking internal and external policy dynamics, the Action has strong potential for breakthrough scientific developments. A central objective is to derive theoretically informed, policy relevant advice for the EU's strategic approach to its international relations, its communication, and for dealing with the interaction between internal and external challenges. It will generate a step change in how the new realities of EU foreign policy are theorised and addressed. This will be achieved by establishing multi-national, multidisciplinary collaborations at the nexus of policy fields and research communities which have not communicated adequately in the past. Substantive efforts to bridge between the "academic-practitioner divide" are made to synthesise knowledge, facilitate shared understandings, and inform EU foreign policy.

Chemobrionics

CHAIR: Prof Julyan Cartwright (SP) julyan.cartwright@csic.es
FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Self-organising precipitation processes, such as chemical gardens forming biomimetic micro- and nano-tubular forms, have the potential to drastically enhance future materials design, as well as enabling us to develop new methodologies to explore, quantify and understand non-equilibrium chemical systems. They may even shed light on the conditions surrounding the origin of life. The physics and chemistry of these phenomena based on the assembly of material architectures under a flux of ions, and their exploitation in applications, has recently been termed chemobrionics. Advances in chemobrionics require a combination of expertise in physics, chemistry, mathematical modelling, biology and engineering, as well as in non-linear and materials sciences, giving rise to a new synergistic discipline. Although progress is currently limited due to the lack of an efficient combination of talented researchers from diverse fields, Europe is uniquely placed to develop a unique and world-leading activity. The aim of the COST Action CBrio is to link research groups across Europe to stimulate new, innovative and high-impact interdisciplinary scientific research on chemobrionics. Our objective is to build bridges between the various communities to enable understanding and the control of the physical, chemical and biological properties of self-organised precipitation processes. This integrated fundamental knowledge will be shared with research groups focusing on specific applications to boost new technological developments, as well as with groups involved in the popularisation of science and those at the interface between science and the arts.

https://www.chemobrionics.eu

Correlated Multimodal Imaging in Life Sciences

CHAIR: Dr Andreas Walter (AT) andreas.walter@vbcf.ac.at

FUNDING PERIOD: October 2018 – October 2022

SUMMARY

The Action aims to fuel urgently needed collaborations in the field of correlated multimodal imaging (CMI), promoting and disseminating its benefits through showcase pipelines, and paving the way for its technological advancement and implementation as a versatile tool in biological and preclinical research. CMI combines two or more imaging modalities to gather information about the same specimen. It creates a composite view of the sample with multidimensional information about its macro-, meso- and microscopic structure, dynamics, function and chemical composition. Since no single imaging technique can reveal all these details, CMI is the only way to understand biomedical processes and diseases both mechanistically and holistically. It relies on the joint multidisciplinary expertise of biologists, physicists, chemists, clinicians and computer scientists, and depends on coordinated activities and knowledge transfer between academia and industry, and instrument developers and users. Due to its inherently multidisciplinary and cross-functional nature, an interdisciplinary network such as this Action is indispensable for the success of CMI. Nevertheless, there is currently no European network in the field. Existing scattered efforts focus on correlated light and electron microscopy or (pre) clinical hybrid imaging. This Action will consolidate these efforts, establish commonly accepted protocols and quality standards for existing CMI approaches, identify and showcase novel CMI pipelines, bridge the gap between preclinical and biological imaging, and foster correlation software through networking, workshops and open databases. The network will raise awareness of CMI, train researchers in multimodal approaches, and work towards a scientific mindset that is enthusiastic about interdisciplinary imaging approaches in life sciences.

https://www.comulis.eu

Increasing understanding of alien species through citizen science

CHAIR: Prof Helen Roy (UK) hele@ceh.ac.uk

FUNDING PERIOD: July 2018 – July 2022

SUMMARY

There is no sign of saturation in the accumulation of alien species (AS) introductions worldwide. Furthermore, the rate at which some species are spreading has also been shown to be increasing. However, the challenges of gathering information on AS have been recognised. Recent developments in citizen science (CS) provide an opportunity to improve data flow and knowledge on AS while ensuring effective and high-quality societal engagement with the issue of invasive alien species (IAS). Advances in technology, particularly online recording and smartphone apps, along with the development of social media, have revolutionised CS and enhanced connectivity while new and innovative analysis techniques are emerging to ensure appropriate management, visualisation, interpretation and use and sharing of data. The Action will address multidisciplinary research questions in relation to developing and implementing CS, advancing scientific understanding of AS dynamics while informing decision-making, specifically implementation of the technical requirements of relevant legislation such as EU Regulation 1143/2014 on IAS, supporting EU biodiversity goals and embedding science within society. The Action will explore and document approaches to establishing a European-wide CS AS network. It will embrace relevant innovations for data gathering and reporting to support the implementation of monitoring and surveillance measures, while ensuring benefits for society and citizens, through an AS CS European network. The Action will, therefore, increase levels of participation and quality of engagement with current CS initiatives, ensuring and evaluating educational value, and will improve the value outcomes for potential users, including citizens, scientists, alien species managers, policymakers, local authorities, industry and other stakeholders.

https://alien-csi.eu/

Ultrafast opto-magneto-electronics for non-dissipative information technology

CHAIR: Prof Andrei Kirilyuk (NL) a.kirilyuk@science.ru.nl
FUNDING PERIOD: October 2018 – October 2022

SUMMARY

The explosive growth of digital data use and storage leads to an enormous rise in energy consumption, which is rapidly becoming unsustainable. Ultrafast opto-magneto-electronics is an emerging field that combines the ideas and concepts of opto-magnetism and spin transport with photonics for ultrafast low-dissipative manipulation and storage of information. Both light and spin currents can control magnetic order, but mechanisms as well as corresponding timescales and energy dissipation differ. The MAGNETOFON Action aims at the best of both worlds, combining short timescales and non-dissipative propagation of light with nanoscale selectivity and strong interactions of spin currents. The ultimate goal is to create and implement non-volatile, low-dissipative and ultrafast functional elements for data technology. The research objectives of the MAGNETOFON Action will be achieved by combining the existing expertise in the scientific communities dealing with ultrafast magnetism, spintronics, magnonics, photonics and advanced spectroscopy, and by sharing the new knowledge arising from the exchanges between them. This Action will result in a considerable leap in the quality and effectiveness of research in Europe, by bridging the existing gaps between these areas. The ambition is to initiate a breakthrough in the field of low-dissipative opto-magnetism and femtosecond spintronics with the help of a joint scientific programme bringing together the currently nearly non-overlapping scientific communities. By training a new generation of scientists at the interface of the involved disciplines, further developments in the field will be ensured together with a successful translation of the scientific breakthroughs into innovative technological solutions.

https://magnetofon.science.ru.nl/

Digital forensics: evidence analysis via intelligent systems and practices

CHAIR: Prof Jesus Medina (SP) jesus.medina@uca.es

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Digital forensics is a part of criminalistics sciences which deals with digital evidence recovery and exploitation in solving criminal cases through the application of scientific principles. There are several increasingly sophisticated methods for collecting digital evidence. In fact, the evolution of technology continuously pushes such methods. However, raw evidence must be used to elicit hypotheses concerning events, actions and facts (or sequences of them) with the goal of obtaining evidence to present in court. Evidence analysis involves examining fragmented and incomplete knowledge, and reconstructing and aggregating complex scenarios involving time, uncertainty, causality and alternative possibilities. No established methodology currently exists for digital evidence analysis. Scientific investigation experts usually proceed by means of their experience and intuition. The challenge of the proposed COST Action involves creating a network for exploring the potential of applying artificial intelligence and automated reasoning in the digital forensics field, and creating synergies between these fields. Specifically, the challenge is to address the evidence analysis phase, where evidence about possible crimes and crimes perpetrators collected from various electronic devices (by means of specialised software, and according to specific regulations) must be exploited to reconstruct possible events, event sequences and scenarios related to a crime. Evidence analysis results are then made available to law enforcement, investigators, public prosecutors, lawyers and judges. Thus, it is crucial that the techniques adopted guarantee reliability and verifiability, and that their results can be explained to the human actors.

https://digforasp.uca.es/

Public Value Capture of Increasing Property Values

CHAIR: Dr Andreas Hendricks (DE)
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FUNDING PERIOD: August 2018 – August 2022

SUMMARY

The shortage of financial resources is a Europe-wide problem. Coming out of the economic and financial crisis, countries as well as municipalities have reduced means to fulfil all their public commitments. Thus, the main aim of this COST Action is to develop a common framework for value capturing and to provide innovative tools for public-value capture based on comparative analysis to optimise the allocation of development costs and benefits as well as to disencumber the public budget. While a considerable database exists, nonetheless it shows big gaps in the data and, in some cases, disagreement between the data sources. Because of the different terms of unearned increments and classifications of value capture, it is not possible to compare the different studies from several countries. This reinforces the idea of approaching the EU for a study based on a network of specialist country representatives to establish a common terminology and classification. A very important result will be the implementation of a permanent Europe-wide network of land-management experts to interchange the knowledge concerning public-value capture and its dissemination to policymakers and the general public. This network will allow the existing tools to be improved through detailed discussions among experts from countries that have similar tools. On the other hand, thought-provoking impulses can be provided by countries with a totally different understanding of value capture. Participants from more than 20 countries are willing to work for the socio-economic breakthrough of public-value capture.

http://www.puvaca.eu

Towards understanding and modelling intense electronic excitation

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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Electronic excitation reaching high-energy density is central to many different applications, from materials processing to medical treatments. It emerges when intense radiation arising from sources such as lasers, swift ions, or high-flux X-ray or electron pulses interact with matter. In general, only partial aspects related to the excitation produced by this type of sources are treated. The lack of a systematic methodology to address the simulation of the underlying phenomena makes it essential to involve scientists from different fields, theoreticians, simulators and experimentalists. A successful methodology will require smart strategies to make existing solutions, which are appropriate within restricted scopes, work together within a multiscale formalism. The proposed COST Action will tackle this challenge through the following approach: 1) Identify and propose experiments to validate simulations as an optimal way to generate progress in the field of intense electronic excitation; 2) Identify the specific role of different radiation sources on electronic excitation-induced effects. This will allow us to connect distinct communities that explore similar effects in parallel; 3) Identify strategies to connect computational methods on different timescales. This will be a central point in the project since, although most methods operate reasonably well within their scope of applicability, their coupling to other approaches is not straightforward; 4) Transfer the newly acquired knowledge to industry and societal applications by taking advantage of COST networking tools. This Action aims at to create a network of research groups with expertise in different parts of the challenge being tackled and with a common research objective.

http://www.cost-ca17126.industriales.upm.es/

Building on scientific literacy in evolution towards scientifically responsible Europeans

CHAIR: Dr Tania (Antoinette) Jenkins (CH)
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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

As citizens, we are confronted with a deluge of information and misinformation from the internet and mass media. Scientific literacy, i.e. the ability to critically evaluate, apply and understand scientific knowledge and how it is produced, is therefore vital for responsible citizenship. It is a prerequisite for generating a knowledge-based society and for enabling citizens to make informed decisions. One of the most important science fields is evolution, the foundation of modern biology. Evolutionary biology has great societal relevance and its findings have far-reaching implications for how we respond to climate change, drug resistance, issues of food security and controversies in modern medicine. However, it is frequently misunderstood or even rejected outright. This makes scientific literacy in evolution an ideal model to research approaches to improve the state of European scientific literacy. This Action will, for the first time, leverage the strengths of diverse stakeholders (evolutionary biologists, education researchers, educators, museum professionals and the media) to generate and analyse approaches used to improve public scientific literacy. Bridging differences in culture and education systems, including participants from a wide range of countries and backgrounds, is a source of innovation in itself. The expected result is to identify targeted strategies to raise levels of scientific literacy in Europe, thereby maximising its innovation potential. The Action will contribute to a culture of responsible research and innovation and will result in a more scientifically literate European citizenship, instrumental in implementing Europe 2020's smart, sustainable and inclusive goals.

http://www.euroscitizen.eu/

Establishment of a Pan-European Network on the Sustainable Valorisation of Lignin

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Lignin has the potential to become the future aromatic raw material for the industry, but is largely underexploited due to a lack of (information on) industrial availability, sustainable applications, and its environmental footprint. Nonetheless, economic considerations make its valorisation mandatory for the viability of future biorefinery operations. To facilitate the transition of a complex, highly underexploited side stream to a major biorefinery product and industrial raw material commodity, a European network is being established to join and coordinate the many efforts under way in academia and to provide industrial stakeholders, including SMEs, with relevant and up-to-date information on lignin. It will cover topics such as: 1) WikiLignin: a database comprising lignin sources, availability, properties and repository of state-of-the-art analytical methodologies and turnkey methods for industry; 2) Bio- and chemo-catalytic conversion technologies, including technology readiness level (TRL) assessment; 3) Industrial application requirements (market demand) versus lignin properties (supply); 4) Development of value chains for lignin valorisation; and 5) Technical and full sustainability aspects, life-cycle assessment, market potential and implementation. This LignoCOST Action brings together industrial stakeholders, SMEs, academia and institutes from different disciplines in pan-European regions active in the pulp and paper, agri and food, biorefinery, chemicals and plastics, infra and building, fuels and energy, and consumer product industries. The main objective is to establish a sound network covering the entire value chain in which relevant information can be produced with a focus on lignin valorisation towards sustainable industrial applications. Only when working together can this information be gathered to cover the technical, non-technical, environmental and socio-economic implications of the most promising lignin value chains.

http://www.lignocost.eu

Catalysing transcriptomics research in cardiovascular disease

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

This Action aims to create an interdisciplinary network to accelerate the understanding of transcriptomics in cardiovascular disease (CVD) and further the translation of experimental data into usable applications to improve personalised medicine in this field. CVD remains the leading cause of death worldwide and, despite continuous advances, better diagnostic and prognostic tools, as well as therapy, are needed. The human transcriptome, which is the set of all RNA produced in a cell, is much more complex than previously thought and the lack of dialogue between researchers and industrials and consensus on guidelines to generate data make it harder to compare and reproduce results. Currently, the lack of an existing network to address the complexity of transcriptomics in CVD gives the CardiRNA Action an advantage. It aims to provide opportunities for collaboration between stakeholders from complementary backgrounds, so that the functions of different RNAs and their interactions can be deciphered more rapidly in the cardiovascular context for translation into the clinic. The Action will generate grant proposals to advance understanding of the transcriptome's role in CVD and to translate findings into clinical applications, thereby fostering personalised medicine and meeting a current public health challenge. It will refine guidelines for transcriptomics investigations in CVD to enhance the reproducibility of results, facilitating clinical product development. It will disseminate knowledge and allow capacity-building through different types of meetings, prioritising students and early career investigators. Thus, this Action will advance studies on cardiovascular transcriptomics, generate innovative projects and consolidate the leadership of European research groups in the field.

https://cardiorna.eu/

Enhancing Psychiatric Genetic Counselling, Testing, and Training in Europe

CHAIR: Dr Franziska Degenhardt (DE)
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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

The EnGagE Action aims to strengthen pan-European research into the newly emerging disciplines of psychiatric genetic counselling (PsyGC) and psychiatric genetic testing (PsyGT), and to develop a framework to facilitate the implementation of both disciplines into routine clinical care. Psychiatric disorders are common, with estimated lifetime risks of around 1-3% for schizophrenia, bipolar disorder and major depressive disorder. The last decade has witnessed major advances in psychiatric genetics. Currently, no form of valid, high-certainty diagnostic PsyGT is available in routine clinical practice. However, in view of recent genetic findings (particularly the identification of pathogenic copy number variants associated with high risks for schizophrenia), major efforts to establish such testing are now under way. The publication of major advances in psychiatric genetics has received wide media coverage, and awareness of the role of genetics in psychiatric disorders is growing among patients and their family members. A greater demand for high-quality information on psychiatric genetics, probably provided in the form of PsyGC, is anticipated. EnGagE is a knowledge-sharing and expertise-enhancing network comprising preclinical and clinical researchers from the fields of neuroscience, psychiatric genetics, psychosocial research, and ethics; clinicians from the fields of psychiatry, psychology, and medical genetics; genetic counsellors, and scientists from diagnostic genetic testing laboratories from Europe and beyond. The Action will establish a framework for PsyGC and PsyGT, develop standardised guidelines, practice recommendations and research protocols, share scientific knowledge and data, and provide standardised training in PsyGC and PsyGT.

https://cost-engage.eu/

The Soil Science & Archaeo-Geophysics Alliance: going beyond prospection

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Archaeological sites can be discovered and recorded in a high-resolution and non-invasive manner using geophysical methods. These measure the spatial variation of a range of physical properties of the soil which may be representative proxies of subsurface archaeology. Less-invasive and cost-effective field procedures have become a top priority for mitigating the destructive effects on our cultural heritage from intensified land use, climate change and the current conflict panorama. At a time when many organisations are investing in advanced geophysical equipment, a major problem is that our ability to fully interpret the information available from geophysical datasets is still very limited. This deficiency prevents geophysical survey moving beyond basic prospection and becoming a significant tool for responding to nuanced questions about archaeology and their host landscapes. This limitation arises from an incomplete understanding of the relationship between soil properties and geophysical measurements. Bridging this gap requires multidisciplinary teams, testing novel methods, plus scholarly discussion to collate the outcomes of projects on the topic. Overcoming these challenges is a prerequisite for maximising the cost-effectiveness of geophysical methods, realising the expected benefits of technological investment and enabling the wider use of geophysical methods in the cultural heritage sector. The SAGA Action will build an international network of geophysicists, archaeologists, soil scientists and other experts to develop our capability to interpret geophysical data and promote research collaborations. Our vision is that, after four years SAGA will have created an environment within which emerging field procedures, enhanced data interpretation and a broader understanding of integrated geophysical methods can flourish.

https://www.saga-cost.eu/

European network for argumentation and public policy analysis

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Providing and criticising reasons is indispensable for achieving sound public policy that commands the support of both citizens and stakeholders. This need is now widely acknowledged in the recent literature and key EU documents, which highlight the perils of populist discourse and policies. APPLY improves the way European citizens understand, evaluate and contribute to public decision-making on such matters of common concern as climate change or energy policies. Addressing this need from a multidisciplinary perspective on argumentation, the APPLY Action identifies gaps between citizens', policymakers' and scholarly experts' argumentation, and explores ways of treating them. This occurs through coordinated research activities in three main areas: a) empirical: an argumentative analysis of EU policy documents and procedures, the media and citizens' discourse resulting in an annotated pan-European database on institutional and citizens' argumentation; b) normative: a critical study of concepts and methods to measure the quality of arguments in public policy results in a unified theoretical and methodological framework to analyse and evaluate public policy argument; and c) prescriptive: the development of tools with which policymakers, citizens and various stakeholders can engage in well-informed argumentative discussions. APPLY will coordinate networking activities such as workshops, conferences, training schools and short-term scientific missions among European and international scholars and stakeholders. This will provide insights into the understanding, evaluation and production of public policy arguments. Thus, the Action will benefit European policymakers and citizens as well as consolidating the currently dispersed argumentation scholarship across Europe and beyond.

https://publicpolicyargument.eu/

Implementing nature based solutions for creating a resourceful circular city

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FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Resource depletion, climate change and degradation of ecosystems are challenges facing cities worldwide, which will increase if cities do not adapt. To tackle such challenges, it is necessary to transform our cities into sustainable systems using a holistic approach. One element in achieving this transition is the implementation of nature-based solutions (NBS). They can provide a range of ecosystem services beneficial for the urban biosphere, such as the regulation of micro-climates, flood prevention, water treatment, food provision and more. However, most of the NBS implemented serve only one single purpose. Adopting the circular economy concept by combining different types of services and returning resources to the city would increase the benefits gained for urban areas. This COST Action aims to establish a network testing the hypothesis that: "A circular flow system that implements NBS for managing nutrients and resources within the urban biosphere will lead to a resilient, sustainable and healthy urban environment". To tackle this challenge, five working groups (WGs) will propose their contribution on closing the resource cycle within the urban biosphere. They will deal with the built environment, urban water, resource recovery, urban farming and transformation tools which connect the WGs with the socio-economic impact. The network of researchers, companies and stakeholders spread over Europe and near neighbouring countries brings together a large diversity of disciplines and is therefore well equipped to take a holistic approach to embedding NBS within the circular economy.

http://circular-city.eu

Optical synergies for spatiotemporal sensing of scalable ecophysiological traits

CHAIR: Dr Martin Schlerf (LU) martin.schlerf@list.lu
FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Vegetated ecosystems largely mediate terrestrial gas and energy exchange at the atmosphere-biosphere-pedosphere interface. The spatial and temporal acquisition of information on vegetation status, health and photosynthetic functioning is fundamental to modelling the dynamic response of vegetation to changing environmental conditions, necessary for climate change and food security studies. Satellite or airborne earth observation (EO) provides the opportunity to collect spatially continuous information on vegetation reflectance globally and at ecologically relevant scales. Optical EO is now advancing towards measuring a signal that is emitted by vegetation (sun-induced chlorophyll fluorescence: SIF). By flying in tandem with Sentinel-3 (S3), ESA's forthcoming FLEX mission will observe SIF which, in combination with reflectance, can indicate actual photosynthetic activity. The FLEX-S3 multi-sensor concept exemplifies the synergistic use of multi-source data to capture scalable eco-physiological traits. This, in combination with other Copernicus missions, will enable novel data analytical techniques to be realised. Then, by combining these data with proximal sensing from drones and flux towers, it becomes possible to address critical open spatiotemporal scaling questions. The synergistic use, processing and interpretation of data from multiple optical instruments at multiple scales have matured to a stage where harmonisation across Europe is now possible. This will be achieved by creating the network proposed in this Action and bringing together the Sentinel-2, S3 and FLEX passive EO communities. Thus, it will develop and further the capabilities for the interpretation of multi-sensor and multi-scale optical measurements and develop common protocols for community use.

http://www.senseco.eu/

Constitution-making and deliberative democracy

CHAIR: Prof Min Reuchamps (BE)
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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

In Europe and across the world, several countries are turning to deliberative democracy to reform their constitutions, while in many others this question is high on the political agenda. Such a transformation also quite radically shuffles the role of the citizenry regarding constitutional changes. Traditionally, such changes have been the sole responsibility of elected officials, in collaboration with experts. With this deliberative turn, many more actors may become involved in designing constitutions: citizens, both individually and collectively, in the form of informal associations, social movements, civil society organisations, participatory consultants and research teams. The main aim of the Action is to bring together all these actors – who are usually not in contact – to discuss and reflect on this democratic challenge, not only in terms of normative ideals but also and above all on the empirical challenges raised by this complex and multifaceted democratic transformation. Because the focus of ConstDeb is on constitutions and deliberative democracy, as a network the Action itself is intended to work in a deliberative fashion. It has three research coordination objectives: 1) To gather and organise information about all deliberative democracy experiments related to constitution-like issues, research and writing about constitutional deliberative democracy, and the actors involved in both; 2) To make this information widely available and widely used; and 3) To promote interaction between actors involved in this area, as well as interested actors who are not yet involved. The primary vehicle to achieve these objectives will be a deliberative portal.

CA17136

Indoor Air Pollution Network

CHAIR: Dr Nicola Carslaw (UK) nicola.carslaw@york.ac.uk

FUNDING PERIOD: September 2018 – September 2022

SUMMARY

In developed countries, we spend 80-90% of our time indoors, where we receive most of our exposure to air pollution. However, regulation on air pollution focuses mainly on outdoors and the indoor environment is less well characterised. Concentrations of many air pollutants can be higher indoors than out, particularly following activities such as cleaning and cooking. With increasing climate change impacts, related energy-efficiency measures are making buildings considerably more airtight. Such measures can increase indoor pollutant concentrations even further. Therefore, to reduce our exposure to air pollution, we must consider both the indoor and outdoor environments and the role of ventilation in order to mitigate through appropriate building operation, use and design. The INDAIRPOLLNET Action will improve our understanding of the cause of high concentrations of indoor air pollutants. It will assemble experts in laboratory and chamber experiments, modelling studies and measurements of relevance to indoor air quality (IAQ), including outdoor air chemists. Our network includes experts in chemistry, biology, standardisation, particulate matter characterisation, toxicology, exposure assessment, building materials (including those manufactured specifically to improve IAQ such as green materials), building physics and engineering (including ventilation and energy) and building design. This Action aims to significantly advance the field of indoor air pollution science, to highlight future research areas, and to bridge the gap between research and business, and to identify appropriate mitigation strategies that optimise IAQ. The findings will be disseminated to relevant stakeholders such as architects, building engineers and instrument manufacturers.

https://indairpollnet.eu/

A network for Gravitational Waves, Geophysics and Machine Learning

CHAIR: Dr Elena Cuoco (IT) elena.cuoco@ego-gw.it
FUNDING PERIOD: October 2018 – October 2022

SUMMARY

The breakthrough discovery of gravitational waves on 14 September 2015 was made possible through a synergy of techniques drawing from expertise in physics, mathematics, information science and computing. At present, there is rapidly growing interest in machine learning, deep learning, classification problems, data mining and visualisation and, in general, in the development of new techniques and algorithms for efficiently handling the complex and massive datasets found in what has been coined 'big data', across a broad range of disciplines, ranging from social sciences to natural sciences. The rapid increase in computing power at our disposal and the development of innovative techniques for the rapid analysis of data will be vital to the exciting new field of gravitational wave (GW) astronomy, on specific topics such as control and feedback systems for next-generation detectors, noise removal, data analysis and data-conditioning tools. The discovery of GW signals from colliding binary black holes and the likely existence of a newly observable population of massive, stellar-origin black holes have made the analysis of low-frequency GW data a crucial mission for GW science. The low-frequency performance of earth-based GW detectors is largely influenced by the ability to handle ambient seismic noise suppression. This COST Action aims to create a broad network of scientists from four different areas of expertise, namely GW physics, geophysics, computing science and robotics, with a common goal of tackling challenges in data analysis and noise characterisation for GW detectors.

http://www.g2net.eu

Integrated European Network on Chronic Graft Versus Host Disease (cGvHD)

CHAIR: Prof Anne Dickinson (UK) anne.dickinson@ncl.ac.uk

FUNDING PERIOD: August 2018 – August 2022

SUMMARY

Chronic GvHD (cGvHD) is a multi-organ allo and autoimmune disorder and a major cause of non-relapse morbidity and mortality following allogeneic haematopoietic stem cell transplantation. It occurs in an estimated 50% of patients per year worldwide and causes a plethora of co-morbidities. There is a lack of coordination at the European research level into cGVHD diagnosis and therapy which impacts on patient care, due to a non-uniform treatment approach across transplant centres. This COST Action will serve as a platform for industry, clinical teams and researchers from numerous disciplines, including bioinformatics, immunology, epidemiology, genetics and cell biology, to enable the dissemination of integrated clinical and laboratory information via established and improved databases. The cGvHD Action will promote novel research as well as more uniform treatment of the disease. Innovation will be accelerated by coordination, networking and the introduction of new technologies and therapies for the benefit of patients by being able to more accurately predict and treat the disease and its co-morbidities. Early career investigators will learn how genomics, proteomics and immunology interact to provide a more personalised medicine approach to treat disease and improve patient outcomes. By studying large-scale populations and coming together as a network, we will further understand the pathogenesis of cGvHD, its subsets and associated co-morbidities and develop a coordinated approach to therapy. Workshops on innovative multidisciplinary research will include genetics, epigenetics, (DNA methylation, microRNAs free and in exosomes) proteomics, lipidomics, the role of the microbiome, and novel stem cell therapies.

http://gvhd.eu/

European Topology Interdisciplinary Action

CHAIR: Dr Luca Tubiana (IT) luca.tubiana@unitn.it

FUNDING PERIOD: October 2018 – October 2022

SUMMARY

Often, the physical properties of many systems, ranging from naturally occurring biopolymers to artificial materials, crucially depend on those global features that cannot be ascribed to a particular geometry or arrangement, but rather to a more abstract notion: topology. The latter manifests itself in the knotted state of proteins and artificial polymers, the intertwining among DNA rings, or the topologically distinct classes of defect lines that can be found in liquid crystals. A better understanding of the interplay between a system's topological state, its three-dimensional structure, and its overall characteristics paves the way towards the greater control of relevant natural molecules or human-made materials, with a remarkable impact on fundamental science as well as high-tech applications. These goals, however, can only be achieved through a multidisciplinary effort, involving a wide spectrum of expertise in a concerted manner. The EUTOPIA Action will establish a collaborative platform to approach all such problems, through the study of biological and soft matter, and featuring topological characteristics. In so doing, it will create a pan-European, synergistic network of researchers from different fields who will overcome geographical, economical and societal barriers, as well as those naturally surrounding traditional academic communities. The outcomes of the research carried out thanks to the EUTOPIA Action will push forward the boundaries of our current understanding of key systems and foster the knowledge transfer of scientific findings to industry and, ultimately, to society as a whole.

https://eutopia.unitn.eu/

Cancer nanomedicine – from the bench to the bedside

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FUNDING PERIOD: September 2018 – September 2022

SUMMARY

Finding efficient cancer therapies is an urgent and still unresolved problem and, in the fight against this disease, scientists are devoting tremendous efforts towards utilising nanomedicines. Nanotherapeutics exhibit major benefits with respect to unmodified drugs, including improved half-life, more efficient tumour targeting, and reduced side effects. However, only a few have reached the commercial level, with most still in the investigational phase. Accordingly, this Action aims to develop and strengthen industry-academia relations with an ultimate goal: fostering the clinical translation of nanomedicine from bench to bedside. This will be achieved by creating the first, pan-European interdisciplinary network of representatives from academic institutions and small and medium-sized enterprises. This will include clinical research organisations devoted to the development of nanosystems carrying anticancer drugs from their initial design, pre-clinical testing of efficacy, pharmacokinetics and toxicity to the preparation of detailed protocols needed for the first phase of their clinical studies. By promoting scientific exchanges, technological implementation and innovative solutions, the Action will provide a timely instrument to rationalise and focus research efforts at the EU level in dealing with the grand challenge of nanomedicine translation in cancer, one of the major and societal-burdening human pathologies. By virtue of its quality, the Action network will also generate core teams of research excellence for funding applications, patent filing and the discovery of major scientific impact. The network will also be actively devoted to raising awareness of the high potential of nanomedicine through publications in international peer-reviewed journals and presentations at open events.

http://www.nano2 clinic.eu

COST Actions starting in 2017
(and finishing in 2022)

COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
CA16203	■						236
CA16204						■	237
CA16205			■				238
CA16207			■		■		239
CA16208	■			■			240
CA16209		■			■		241
CA16210			■				242
CA16213					■	■	243
CA16214	■						244
CA16215	■						245
CA16216			■				246
CA16217		■	■				247
CA16218	■	■					248
CA16219	■	■					249

COST Actions	Natural sciences	Engineering and technology	Medical and health sciences	Agricultural sciences	Social sciences	Humanities	Pages
CA16222	■	■			■		250
CA16223			■				251
CA16224	■						252
CA16225			■				253
CA16226		■	■				254
CA16227	■	■					255
CA16228	■				■		256
CA16229					■		257
CA16230				■			258
CA16231			■	■			259
CA16232					■		260
CA16234			■		■		261
CA16235		■					262

Stem cells of marine/aquatic invertebrates: from basic research to innovative applications

CHAIR: Prof Loriano Ballarin (IT) Loriano.ballarin@unipd.it

FUNDING PERIOD: October 2017 – April 2022

SUMMARY

The stem cells discipline represents one of the most dynamic areas in biology and biomedicine. While adult marine/aquatic invertebrate stem cell (MISC) biology is of prime research and medical interest, studies on stem cells from organisms different from the classical models (e.g. human, mouse, zebrafish) have not been pursued vigorously. Marine invertebrates as a whole portray the largest biodiversity and the widest phylogenetic radiation on earth, from morphologically simple organisms (e.g. sponges, cnidarians) to the more complex molluscs, crustaceans, echinoderms and protochordates. Likewise, they illustrate a kaleidoscope of MISC types that participate in the production of enormous novel bioactive molecules, many of which are of significant potential interest for human health (antitumor, antimicrobial). Furthermore, MISC participate in ageing and regeneration phenomena, including whole-body regeneration, the knowledge of which can be clinically relevant. Until now, the European MISC community has been highly fragmented and very few ties were established with biomedical industries to harness MISC for human welfare. Thus, this Action aims to: i) consolidate the fragmented European community working on MISC; ii) promote and coordinate European research on MISC biology; iii) stimulate young researchers to approach research on MISC biology; iv) develop, validate, train and network around novel MISC tools and methodologies; v) establish the MISC discipline foremost in the interest of biomedical disciplines; and vi) establish collaborations with industries to exploit MISC as a source of bioactive molecules.

http://www.maristem.eu

Distant Reading for European Literary History

CHAIR: Prof Christof Schöch (DE) schoech@uni-trier.de

FUNDING PERIOD: November 2017 – April 2022

SUMMARY

This Action's challenge is to create a vibrant and diverse network of researchers jointly developing the resources and methods necessary to change the way European literary history is written. Grounded in the distant reading paradigm (i.e. using computational methods of analysis for large collections of literary texts), the Action will create a shared theoretical and practical framework to enable innovative, sophisticated, data-driven, computational methods of literary text analysis across at least 10 European languages. Fostering insight into cross-national, large-scale patterns and evolutions across European literary traditions, it will facilitate the creation of a broader, more inclusive and better-grounded account of European literary history and cultural identity. To accomplish this, the Action will: i) build a multilingual European Literary Text Collection (ELTeC), ultimately including around 2,500 full-text novels in at least 10 different languages, enabling the testing of methods and comparing results across national traditions; ii) establish and share best practices and develop innovative computational methods of text analysis adapted to Europe's multilingual literary traditions; and iii) consider the consequences of such resources and methods for rethinking fundamental concepts in literary theory and history. The Action will contribute to the development and distribution of methods, competencies, data, best practices, standards and tools relevant to distant reading research. This will not only affect the way scholars in the humanities do research, but also the way institutions such as libraries will make their assets available to researchers in the future. The Action will foster distributed research, the systematic exchange of expertise, and the visibility of all participants, activities and resources.

https://www.distant-reading.net/

European Network on Understanding Gastrointestinal Absorption-related Processes

CHAIR: Prof Patrick Augustijns (BE)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Oral administration is the most common drug-delivery route. Absorption of a drug from the gut into the bloodstream involves disintegration of the dosage form, dissolution of the API, and transport across the gut wall. The efficiency of these processes is determined by highly complex and dynamic interactions between the gastrointestinal tract, the dosage form and the API. The fraction of the drug absorbed is affected by various factors, including physiological variables, pathological conditions, local differences in gut permeability, the intraluminal behaviour of the formulation, and the effect of foods. This complex interplay determines drug-delivery performance and may cause large inter-individual variability, but is poorly understood. Furthermore, comparison between drug absorption studies is hampered due to knowledge fragmentation and lack of standardisation across pharmaceutical sub-disciplines. As a result, the available knowledge is underutilised in drug development and clinical treatment. The European network on understanding gastrointestinal absorption-related processes (UNGAP) is a multidisciplinary network of scientists aiming to advance the field of intestinal drug absorption by focusing on four major challenges: i) differences between specific patient populations; ii) regional differences along the gastrointestinal tract; iii) the intraluminal behaviour of advanced formulations; and iv) the food-drug interface. The integration of knowledge, combined with the exchange of best practices across sectors and disciplines, will help improve our understanding of intestinal drug absorption and spur future developments in the field. The Action also aims to advance the career of young, talented researchers from across Europe, thereby strengthening Europe's leading position in pharmaceutical sciences.

http://www.ungap.eu

European Network for Problematic Usage of the Internet

CHAIR: Prof Naomi Fineberg (UK)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Problematic use of the internet (PUI) and its impact on the health and well-being of European citizens represents an emerging challenge for mental health research. The aim of this Action is to bring together a multidisciplinary and geographically diverse group of experts and opinion leaders under one European-led network, to leverage the existing funded research into a more coherent programme to advance the understanding of PUI from a bio-psychosocial perspective, clarify the brain-based undergirdings, and develop effective interventions. The network will invite experts in animal and human neuroscience, genetics, clinicians and the bio- and information technology industries to join with policymakers, health-service planners, patients and carers in an integrated four-year work-plan designed to: i) share knowledge and interchange ideas and best practice to generate common science and technology programmes; ii) address training gaps and build research capacity; iii) strengthen science and technology communication; iv) foster integration of less-research-intensive countries; and v) promote new transdisciplinary, translational approaches to tackle PUI. In so doing, the Action will deliver a platform to advance brain-based research into PUI and drive forward the development of: i) clinical tools and treatment-targets; ii) therapeutic interventions that may be broadly applied and to improve health and well-being; iii) biomarkers to enable early detection of PUI in at-risk subjects before symptoms become apparent, leading to; iv) early intervention strategies to prevent progression, chronicity and the development of costly co-morbidities such as anxiety and depression; and v) health promotion through public-patient involvement and health and social policy advance.

http://www.internetandme.eu

Knowledge conversion for enhancing management of European riparian ecosystems and services

CHAIR: Dr Simon Dufour (FR) simon.dufour@univ-rennes2.fr

FUNDING PERIOD: November 2017 – May 2022

SUMMARY

Vegetation is a central component of riparian landscapes and provides multiple ecosystem services. The scientific community is aware of the importance of riparian vegetation and its role in both biological and physical processes. In recent decades, such importance has stimulated a steadily growing number of investigations focusing on riparian vegetation. However, scientific investigations in this field remain isolated initiatives that translate into common practices at a very slow rate and with limited input from practitioners. Evidence of poor knowledge conversion at societal levels includes the marginality of riparian vegetation in EU normative assets (e.g. the Water Framework Directive) and the total neglect of vegetation-mediated processes in water policy debates. The limited consideration of riparian vegetation is also demonstrated by the widespread degradation of riparian forests resulting from centuries of water use and environmental pressures exerted by society on rivers. Such degradation has motivated many restoration and mitigation projects aiming to improve riparian status. Unfortunately, many have failed because of scarce consideration of vegetation-mediated processes, meaning that public resources have been ineffectively allocated. To address the above-mentioned issues, this Action aims to establish a baseline in knowledge concerning riparian vegetation, coordinate research efforts, contribute to knowledge conversion from science to practitioners and to COST Inclusiveness Target Countries, and to promote practitioners' research interests in the scientific community.

http://converges.eu/

Natural Flood Retention on Private Land

CHAIR: Prof Lenka Slavikova (CZ) lenka.slavikova@ujep.cz

FUNDING PERIOD: September 2017 – March 2022

SUMMARY

Climate change is increasing the frequency and intensity of future flood events, leading to higher costs of flood damages and a growing public demand for protective measures. Traditional flood protection measures, based mainly on grey infrastructure (i.e. dykes, dams, etc.), are not sufficient to cope with dynamic flood risk alone. Nature-based solutions such as natural water-retention measures (NWRM) are promising options to mitigate flood risks as a complement to grey infrastructure. These types of measures not only serve to reduce risk, but also provide additional ecosystem services, including greater biodiversity and recreation opportunities. However, a common characteristic of green infrastructure measures is that they often claim more land than traditional methods. The challenge is to consider multifunctional land uses which enable temporary flood retention and flood storage on private land without restricting the provision of other ecosystem services. A reconciliation of flood risk management and land management is needed. Since all NWRM primarily need to be implemented on private land, consideration of multiple aspects includes economic issues (e.g. how to compensate for or incentivise flood-retention services); property rights issues (e.g. how to allow temporary flood storage on private land); issues of public participation (e.g. how to ensure the involvement of private landowners) as well as issues concerning public subsidies (e.g. how to integrate/mainstream flood retention in agricultural subsidies). The LAND4FLOOD Action aims to address these different aspects and to establish a common knowledge base and channels of communication among scientists, regulators, land owners and other stakeholders in the field.

http://www.land4flood.eu/

Maximising Impact of research in NeuroDevelopmental DisorderS

CHAIR: Prof Adrian Harwood (UK) harwoodaj@cf.ac.uk

FUNDING PERIOD: November 2017 – May 2022

SUMMARY

This Action focuses on the study of patients with rare neurodevelopmental disorders (NDD) which has the potential to make a major impact on our understanding and treatment of NDD in general, including schizophrenia and autism spectrum disorder (ASD). NDD affect 1 in 25 individuals in Europe, and have a high impact on healthcare systems, economic development and society. A lack of mechanistic knowledge is hampering the development of better treatments. For the first time, new knowledge from psychiatric genomics is providing a route to identify neurobiological mechanisms underlying NDD. The key challenge is to link genetic risk to altered brain biology. Although highly informative, substantial variability and the severity of psychiatric symptoms means that genomic studies based on the general NDD patient population experience significant difficulties in assigning individual gene mutations to clinical phenotype. A solution to this challenge is to study a sub-group of NDD patients where deletions or duplications of DNA segments (copy number variants, CNV) alter gene dosage and have a strong causal relationship with NDD. These pathogenic CNV present a major opportunity to establish a mechanistic understanding and develop new therapies. However, NDD patients with these CNV are rare and require coordinated, international collaboration to find and study them in large numbers. MINDDS will create a pan-European network of clinical scientists, preclinical researchers and patient representatives to advance studies of NDD patients for these pathogenic CNV. It will create a legal and ethical framework for effective transnational NDD patient cohort building, develop standardised protocols, and establish effective mechanisms for effective data sharing and knowledge exchange.

https://mindds.eu

New Exploratory Phase in Research on East European Cultures of Dissent

CHAIR: Dr Maciej Maryl (PL) maciej.maryl@ibl.waw.pl
FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Resistance and dissent in former socialist Europe 1945-1989 constitutes a remarkable chapter of Europe's recent past, which not only informs decisively the identities of post-socialist societies, but has also reshaped the continent as a whole and still provides an important reference for contemporary social movements worldwide. The proposers of this Action believe that, after a period of growth and consolidation, this field of study and the respective domain of cultural heritage have stalled and fallen short of their true significance. This state of affairs results from: i) the inheritance of Cold War-era conceptual distinctions; ii) confinement of research within national silos; and iii) neglecting the problem of access to original archival sources for digitally enabled research, due to both their heterogeneity and uneven investment in research infrastructures. The main aim of the Action is to trigger the next discovery phase of this legacy by forging a new, reflexive approach and providing a platform for incubating networked, transnational, multidisciplinary and technology-conscious research with creative dissemination capacities. The Action will create a valuable interface for communication between three communities of practice: researchers and archivists, art and cultural heritage curators, and IT experts with humanities and social sciences expertise in order for future research to be technologically advanced and better disseminated. This network will enable participant researchers to train with cutting-edge digital tools, and to increase their capacities for creative dissemination by engaging in productive dialogue with art and cultural heritage curators, and proposing best cooperation practices between these three communities.

http://nep4dissent.eu/

The multi-messenger physics and astrophysics of neutron stars

CHAIR: Dr Nanda Rea (SP) rea@ice.csic.es
FUNDING PERIOD: November 2017 – May 2022

SUMMARY

In years to come, the recent discovery of gravitational waves will allow for an unprecedented view of previously invisible parts of the universe. This will unravel the physics of the most compact stars, the neutron stars, which are unique objects whose emission encompasses all the available multi-messenger tracers: electromagnetic waves, cosmic rays, neutrinos and gravitational waves. These relativistic stars are also unique laboratories where not only the most extreme gravity and electromagnetism can be probed, but also strong and weak interactions can be studied in regimes that have no hope of being explored on earth. The study of these objects transcends the traditional astrophysical approach and requires a multidisciplinary effort that spans particle and nuclear physics to astrophysics, experiment to theory, and gravitational waves to the electromagnetic spectrum. The PHAROS Action has the ambitious goal of taking on key challenges in the physics involved in neutron stars by facing them via an innovative, problem-based approach, focusing on both current and new data and experiments, which hinges on interdisciplinary working groups. Each group will have all the diversified expertise needed to tackle different aspects of the data and physics of neutron stars and will deliver several tools and deliverables to the different communities prepared in a shared language. Furthermore, a key priority of this Action is promoting – via training, mobility, gender and outreach activities – enthusiastic students and young researchers who will grow and spread the Action's innovative multidisciplinary approach, paying special attention to promoting the COST Inclusiveness Target Countries.

http://www.pharos.ice.csic.es/

European network for the promotion of portable, affordable and simple analytical platforms

CHAIR: Dr Guillaume Erny (PT) guillaume@fe.up.pt

FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Research in separation science is a thriving field with dedicated journals and conferences. This research area is dominated by the so-called 'big scientific instruments' which have enabled multiple breakthroughs in health, forensics, pollution or agri/food. However, the high cost of such instruments and the need for skilled professionals to operate them are limiting their use to a few social and economic spheres of society. Modern separation techniques are no longer limited to large instrumentation, with numerous studies demonstrating the possibility of achieving fast and efficient analysis using low-cost devices. Such tools would be highly beneficial to SMEs and small organisations that do not have the financial and human resources to afford large, expensive instruments. It is therefore of economic and societal interest to facilitate and promote a wider use of such analytical platforms. With low-budget organisations in mind, such instruments should be affordable and simple to use, allowing for their utilisation by inexpert staff. Ideally, they should also be portable so that they can be used on-site or in the field and are easily carried around. The PortASAP Action aims to work towards this goal by involving scientists working in separation sciences, engineers, chemometricians and other scientific fields, with end-users lacking expertise in analytical chemistry and instrument manufacturers. PortASAP will provide a platform where analytical requirements in applied areas can be matched with expertise. It will also provide training and promote awareness regarding the potential of low-cost analytical techniques.

http://portasap.eu/

Network on the Coordination and Harmonisation of European Occupational Cohorts

CHAIR: Dr Ingrid Sivesind Mehlum (NO) ism@stami.no
FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Occupation and paid employment are essential components of adult life and major determinants of health and healthy ageing. However, in recent years, there has been very limited coordination and promotion of European health research on occupation and employment. Europe currently has some of the most valuable occupational, industrial and population cohorts worldwide. The lack of integration of these cohorts is hampering the optimal exploitation of these resources, which are essential to underpin evidence-based interventions and policy. The overarching concept of the 'Network on the coordination and harmonisation of European occupational cohorts' (OMEGA-NET) is to create a network to optimise the use of occupational, industrial and population cohorts at the European level. OMEGA-NET will advance the: i) collaboration of existing cohorts, with extensive contemporary information on employment and occupational exposures; ii) coordination and harmonisation of occupational exposure assessment efforts; and iii) facilitation of an integrated research strategy for occupational health in Europe. We will inventory numerous cohorts with occupational information in Europe; implement an online interactive tool with detailed information on existing cohorts; facilitate work on the harmonisation of occupational exposure and health outcome information and new protocols for data collection; connect scientific communities on occupational health in Europe and beyond; and provide networking, leadership and training opportunities for early-career researchers in occupational epidemiology and exposure assessment. The Action will provide the foundation for an enhanced evidence base for the identification of health risks and gains related to occupation and employment to foster safe and healthy preventive strategies and policies.

http://omeganetcohorts.eu/

European network of multidisciplinary research to improve the urinary stents

CHAIR: Dr Federico Soria (SP) fsoria@ccmijesususon.com

FUNDING PERIOD: September 2017 – March 2022

SUMMARY

The indwelling of urinary stents is a very frequently used method within urological practice, to ensure urine drainage. Regardless of its composition – polymeric or metallic – it is associated with high morbidity. Stented patients have functional impairment in many aspects of everyday life, including anxiety, sexual dysfunction and desire, loss of work days, and a significant impact on patients' quality of life. This poorer quality of life has a significantly negative economic impact, too, with further costs for medical consultations, hospitalisation, and an increased intake of antibiotic, analgesic and alpha-blockers to mitigate the side effects of these prosthesis. Therefore, the prime objective of this Action is to create a multidisciplinary group to identify the inherent problems in urinary stents, related to their design, composition, biomaterials, coatings, encrustation, interaction between urinary tract-stent and fluid dynamics, and the physiology effects on the urinary tract, assessing the problem from different points of view. The Action members, from the clinical, experimental and bioengineering fields, will evaluate the applications of nanotechnology, biodegradable materials, coatings, metal stents, drug-eluting biodegradable designs, and tissue-engineered stents for use in future urinary stents. This Action will provide an extensive, interdisciplinary training programme, including scientific/technical, market and social skills content, which will contribute to strengthening the interactions within the Action consortium and improving the chances of early-career researchers on the job market. Overall, its success will contribute to improving patients' quality of health, reducing health-care costs, and enhancing the competitiveness of the European medical device industry.

https://www.enius.org/

NANOSCALE COHERENT HYBRID DEVICES FOR SUPERCONDUCTING QUANTUM TECHNOLOGIES

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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Superconducting technologies are prime candidates to ripen quantum effects into devices and applications. Over decades of work, the knowledge accumulated in understanding superconductivity now enables scientists to do experiments by design, controlling relevant parameters in devices. A new field is emerging with the final objective of improving appliances ability to take advantage of quantum effects, be it for the dissipationless transport of current, and the generation of high magnetic fields, sensors or quantum information. The field will impact crucial areas for societal development, including energy, transport, medicine or computation. Quantum behaviour is controlled by using hybrids of superconductors with magnets, insulators, semiconductors or normal metals. Traditionally, the scientific and technical communities working in superconductivity are spread across projects from different calls, whose activities put Europe at the frontier of research. The present Action aims to address the pressing need for a common place to share knowledge and infrastructure and develop new cooperative projects. To this end, we have set up a programme including networking activities with an open, proactive and inclusive approach towards other researchers and industry. We will develop the concept of a 'virtual institute' to improve availability of infrastructure and knowledge, and focus on contributing to gender balance and the participation of young researchers. The proposal aims to avoid duplication of resources and skills in a subject traditionally dominated by small groups working independently. This will optimise European efforts in this area and uncover our full potential, thereby maintaining and developing Europe's leading position in superconducting quantum technologies.

http://nanocohybri.eu/

Harmonization of UAS techniques for agricultural and natural ecosystems monitoring

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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Environmental monitoring is a critical issue for comprehending climate impact on natural and agricultural systems, understanding hydrological processes, optimising water resources, and preventing natural disasters. Nowadays, most of the available data is gathered via ground-based measurements or remote sensing which provide limited information in terms of spatial extent or resolution (temporal or spatial). In this context, one of the greatest potentials in environmental monitoring is represented by the use of unmanned aerial systems (UASs) the application and use of which is rapidly growing in the scientific community. These devices offer an extraordinary opportunity to fill the existing gap between remote sensing and field measurements providing high-resolution measurements over wide areas and at high frequency. UASs allow for extending and improving the description of river-basin hydrology, agricultural systems and natural ecosystems to deliver an impressive level of detail. Several new UAS-based approaches have been introduced recently to monitor soil-water content, vegetation state, river evolution and stream flow during low flow and floods. Such measurement practices, algorithms and data-assimilation techniques should be harmonised to enhance our ability to monitor the environment. The Action will coordinate efforts to address these issues by establishing harmonised monitoring practices, enhancing the use of observations by promoting new monitoring strategies, bringing together different communities, facilitating data transfer, upgrading and increasing knowledge through networking, exchange and training, and linking them to activities in international agencies and global networks.

http://www.costharmonious.eu

Wider Impacts and Scenario Evaluation of Autonomous and Connected Transport

CHAIR: Dr Nikolas Thomopoulos (UK)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Autonomous vehicle (AV) trials are currently taking place worldwide and Europe has a key role in the development of the relevant technology. Yet, there is very limited research regarding the wider implications of the deployment of such vehicles on existing road infrastructure, since it is unclear if and when the transition period will start and conclude. It is anticipated that improved accessibility and road safety will constitute the primary benefits of the widespread use of AVs, whilst co-benefits may also include reduced energy consumption, improved air quality or better use of urban space. Therefore, the focus of this Action is on observed and anticipated future mobility trends and implications for travel behaviour, namely car sharing, travel time use or choice of residential location, to name but a few. Other important issues to be explored under different deployment scenarios are social, ethical, institutional and business impacts. To achieve this, it is essential to achieve a high level of cooperation between a wide range of stakeholders at local, national and international level, including academics and practitioners. Consequently, this Action will facilitate collaboration within Europe and beyond on this emerging topic of global interest.

http://www.wise-act.eu

LEukaemia GENe Discovery by data sharing, mining and collaboration

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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Childhood acute lymphoblastic leukaemia and lymphoma account for ~30% of all childhood cancers, but the causes remain largely unknown. Recently, both low- and high-impact genetic risk factors for familial and non-familial childhood leukaemia/lymphoma have been identified. Studying patients with distinct rare genetic predisposition to leukaemia/lymphoma is crucial, because the underlying biologic mechanisms are likely to be relevant for leukaemogenesis and lymphomagenesis in general. Depending on the mutated pathways in patients with a genetic predisposition, patients may need an adapted treatment strategy because of poor treatment response and/or increased risk of severe toxicities. Moreover, knowledge of genetic predisposition is of interest to relatives at risk. To learn as much as possible from and for these patients, international collaboration between leukaemia and lymphoma experts is crucial. Accordingly, this Action, which includes paediatric oncologists, geneticists and scientists from multiple countries in and outside Europe, will meet on a regular basis to exchange research strategies and establish joint research projects and therapeutic activities addressing patients with leukaemia/lymphoma predisposition. Due to improving and less costly genome and epigenome mapping technologies, the field is rapidly changing. We foresee that through the proposed collaboration we can strengthen our expertise in the areas of leukaemia/lymphoma aetiology, biology, epidemiology, treatment, toxicity risk management, counselling, and psychological impact in a highly significant manner. This international application is a first step towards promoting these broad and critical activities that will be crucial for childhood leukaemia/lymphoma research and improved healthcare.

https://www.legend-cost.eu/

European Raptor Biomonitoring Facility

CHAIR: Mr Guy Duke (UK) guy.duke@skynet.be

FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Environmental contaminants impose multi-billion costs on human and wildlife health. The ERBFacility seeks to reduce these costs, meeting pan-European needs for: a) the enhanced effectiveness of the evaluation of chemicals laws; b) more reliable risk assessment of compounds; and c) early warning of emerging contaminant problems. Using raptors as particularly appropriate sentinels for persistent, bioaccumulative and toxic (PBT) compounds, the ERBFacility will help answer the questions: i) is legislation effective in reducing environmental exposure to contaminants in Europe? ii) what are the environmental risks of specific chemicals? and iii) are there emerging contaminant problems requiring remedial action? The Action will improve the effectiveness of evaluation, risk assessment and early warning in relation to the regulation of priority substances, plant-protection products, biocides, veterinary products and heavy metals. It will deliver linked research coordination and capacity building in three arenas: i) analysis (academics, laboratories, regulatory agencies); ii) collections (natural history museums, environmental specimen banks and other collections providing samples for analysis); and iii) in the field (gathering samples and relevant contextual data). The ERBFacility is timely and relevant given the shift in chemicals regulation from national to the EU level and the 7th Environment Action Programme call for better scientific knowledge for a non-toxic environment. It fills a key gap in wildlife biomonitoring and complements recent European developments in human biomonitoring. The Action will underpin next-generation biomonitoring in Europe by delivering: complementary frameworks for a European Raptor Biomonitoring Scheme, a distributed European Raptor Specimen Bank and a European Raptor Sampling Programme; a meta database of samples; harmonised standards and protocols for analyses and sampling; best practice guidance for sampling; and proof of concept for pan-European assessments and harmonised sampling.

https://erbfacility.eu/

Realising the therapeutic potential of novel cardioprotective therapies

CHAIR: Prof Derek Hausenloy (UK) d.hausenloy@ucl.ac.uk

FUNDING PERIOD: October 2017 – April 2022

SUMMARY

Acute myocardial infarction (AMI) and the heart failure that often follows are the leading causes of death and disability in Europe. As such, new treatments are required to protect the heart against acute ischaemia/reperfusion injury (IRI) in order to preserve cardiac function and prevent heart failure – a strategy termed 'cardioprotection'. Despite intensive research, there are currently no effective cardioprotective therapies in clinical practice. The challenge has been to successfully translate novel cardioprotective therapies discovered in the laboratory setting into the clinical setting. This EU-Cardioprotection Action will address this challenge by setting up a pan-European research network of leading experts in cardioprotection, to jointly develop innovative strategies for translating novel cardioprotective therapies into the clinical setting for patient benefit. This will be achieved through four main objectives each linked to a working group (WG): i) To use innovative strategies to discover novel targets for cardioprotection (WG1: new targets); ii) To investigate the effects of combination therapy directed at multiple targets as an innovative cardioprotective strategy (WG2: combination therapy); iii) To use more clinically relevant animal models for testing novel cardioprotective therapies taking into account the confounding effects of co-morbidities and co-medication (WG3: confounders); and iv) To set up a European network of research centres (European Cardioprotection Consortium) for: a) multi-centre preclinical testing of novel cardioprotective therapies using small/large animal models of acute myocardial IRI; and b) proof-of-concept clinical testing of novel cardioprotective therapies in AMI patients (WG4: consortium). The Action aims to improve the translation of novel cardioprotective therapies for patient benefit.

http://www.cardioprotection.eu

Indoor living space improvement: Smart Habitat for the Elderly.

CHAIR: Mr Francisco José Melero (SP) Fj.melero@cetem.es
FUNDING PERIOD: October 2017 – April 2022

SUMMARY

By 2050, the number of people in the EU aged 65 and over is expected to grow by 70% and the number of people aged over 80, by 170%, which will increase demand and costs for healthcare. Integrating ICT solutions into habitats, along with improved building design, will allow us to live at home and stay active and productive for longer, despite cognitive or physical impediments. In general, improving accessibility, functionality, and safety at home, at work and in society requires combining many disciplines to develop solutions that integrate ICT, ergonomics, healthcare (psychological and physical), building and community design. The furniture sector plays an incredibly important role. Not only is it a critical part of the European economy, but it can also significantly improve the accessibility of the built environment for the elderly by integrating ICT solutions, ergonomic design, and better accommodating the elderly's health needs. The present Action will create a science and technology network where relevant actors from academia and research and industry sectors will utilise networking tools and activities to address the ageing population challenges facing Europe. It will help to reduce any redundancy in RDI efforts, ensure solutions are developed with a broader set of expertise, and help refine the efforts of diverse group of researchers. SHELD-ON aims to foster knowledge exchange and the development of a joint research agenda in terms of design and development of multifunctional indoor environments to meet the requirements of Europe's ageing population while promoting healthy and safe ageing.

http://www.sheld-on.eu

Investigation and Mathematical Analysis of Avant-garde Disease Control via Mosquito Nano-Tech-Repellents

CHAIR: Dr Peyman Ghaffari (PT) pgsaid@fc.ul.pt
FUNDING PERIOD: September 2017 – March 2022

SUMMARY

IMAAC is aiming at an investigation and mathematical analysis of the effect of avant-garde control measures in vector-borne diseases involving day-time active mosquitoes transmitting diseases like dengue, Zika, chikungunya and yellow fever. The control measures involve new technologies in textile and paint products based on nano- and micro-particles releasing repellents or pesticides in a well-portioned dosage. The study will also be expanded to scenarios using vaccines in combination with the mentioned control techniques. The main focus will be on dengue fever transmitted via Aedes aegypti and Aedes albopictus mosquitoes in synergy with existing EU projects, although the application will also have positive effects on other vector-borne diseases. Nano- and micro-particles are used in textile production for various purposes, and can be used to release chemicals like repellents and insecticides at a well-controlled rate. First attempts have been made in this direction, but no efficacy studies have been performed as yet. The spectrum of combinations of nano- or micro-particles, repellents, insecticides and types of textiles (or paint) has not been studied well. In particular, efficacy studies in cases using these control measures in combination with vaccines are unchartered territories, and mathematical modelling has to be developed. This Action aims to bring together experts from epidemiology, biostatistics, mathematics, biology, nanotechnology, chemical and textile engineering to implement new techniques to combat mosquito-transmitted vector-borne diseases. The key question remains how far such avant-garde measures can help to reduce the burden of disease, eventually in collaboration with existing vaccines which turned out to have only limited efficacy on their own.

http://imaac.eu/

European Network for Game Theory

CHAIR: Dr Mathias Staudigl (NL)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

With the rapid advancement of technological innovations, modern societies rely increasingly on the proper functioning of complex networks (i.e. social, telecommunication and transportation networks). Since the state and dynamics of these networks are determined by independent decision-makers, a solid understanding, control and optimisation of such networked systems constitutes a major challenge for modern societies. Nowadays, game theoretic concepts are used in the analysis of networked systems, such as the computation of traffic equilibria in large-scale transportation networks, the prediction of content popularity in social networks and online services, and analysis of the spreading of diseases and epidemics. Since there are many applications from different fields exhibiting similar network structures (e.g. biological, technological and social networks) and each of these applications has field-specific characteristics, this Action needs to bring together researchers from different fields of science, such as applied mathematics, algorithmic computer science, engineering and economics. The key objective of the Action is to facilitate interactions and collaborations between different groups of game theorists, to provide game theoretic expertise to industrial partners, and to establish a large and vibrant interconnected community of excellent scientists in these different fields. This Action will create the first European network where computer scientists, applied mathematicians, economists and operations researchers will join forces on problems with significant technological and socio-economic impact. At a meta-level, the aim is to create a broad community of game theorists across Europe, at every stage of their career, and to facilitate contact with stakeholders.

https://gametheorynetwork.com

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European Network for Environmental Citizenship

CHAIR: Dr Andreas Hadjichambis (CY)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

The European network for environmental citizenship (ENEC) aims to improve understanding and assessment of environmental citizenship in European societies and participating countries. Environmental citizenship is a key factor in EU's growth strategy (Europe 2020) and its vision for a sustainable development, green and circular economy and low-carbon society (EU-roadmap 2050). The Action's integrated network will diminish the barriers between human, economic, social, political and environmental sciences multiplying the knowledge, expertise, research and insights of different stakeholders (researchers, scholars, teachers, practitioners, policy officials, NGOs, etc.) related in environmental citizenship. The focus will be on different macro- and micro-level dimensions of formal and non-formal education that could lead to environmental citizenship. By developing national, European and international collaborations, the ENEC will enhance the scientific knowledge and attract attention to environmental citizenship. The expected deliverables include: a) the creation of a website; b) a repository database of scientific measures and evidence-based interventions that target environmental citizenship; c) the facilitation of scientific training schools, short-term scientific missions and conferences; and d) the dissemination of collaborative working papers, scientific reports, proceedings, academic publications, policy and recommendation papers and an edited book on environmental citizenship. The Action will conceptualise and frame environmental citizenship and develop new research paradigms and metrics for assessing it. Good examples and best educational practices leading to pro-environmental attitudes, behaviour and values will be highlighted and promoted. Policy measures and recommendations will be proposed. The Action will serve as a vehicle to defragment the knowledge and expertise on environmental citizenship.

http://enec-cost.eu/

Combatting anthelmintic resistance in ruminants

CHAIR: Dr Johannes Charlier (BE) jcharlier@kreavet.com

FUNDING PERIOD: September 2017 – March 2022

SUMMARY

Helminth parasitic pathogens cause severe disease and are among the most important production-limiting diseases in grazing ruminants. Frequent use of anthelmintics to control these infections has resulted in the selection of drug-resistant helminth populations. Today, anthelmintic resistance (AR) is found in all major helminth species across Europe and globally. The COMBAR Action will advance research on the prevention of anthelmintic resistance in helminth parasites in ruminants in Europe and disseminate current knowledge among all relevant stakeholders. By gathering parasitologists, social scientists and agricultural economists, COMBAR will bring together a multidisciplinary blend of scientists who do normally rarely interact. Inclusion of SMEs and industry in the consortium will facilitate the dissemination of knowledge and novel technologies across the animal health playing field. COMBAR will integrate novel developments in the field of: i) diagnostic tests; ii) vaccines to protect animals from infection; iii) anti-parasitic forages; iv) selective treatment strategies; and v) decision-support tools. COMBAR will tackle AR by evaluating these novel technologies and assessing their economic trade-offs and barriers to uptake in a European coordinated approach.

https://www.combar-ca.eu/

European Network of Vaccine Adjuvants

CHAIR: Dr Maria Lawrenz (CH)
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FUNDING PERIOD: November 2017 – May 2022

SUMMARY

This Action aims to bring together experts and stakeholders from the three main areas of vaccine research – human infectious disease, cancer, and animal disease – in order to address one of the most critical steps in vaccine development: the use of adjuvants in vaccine formulations. The ultimate goal is to establish a platform to discuss, share and synergise available knowledge on adjuvants and vaccine formulation, and to coordinate their translation into successful, safe and innovative vaccines. Significant effort will be put into bridging these three separate vaccine fields. This network will significantly strengthen ongoing EU-funded activities and provide a platform for accelerating the development of affordable and effective vaccines in Europe. In addition, as well as sharing their experiences with each other, the Action participants will also engage with the general public, providing impartial, balanced and scientific information on adjuvants and vaccines. This Action will contribute to strengthening Europe's position as a global leader in vaccinology and will increase knowledge across the currently separated fields of vaccine development, as well as providing a repository of information for the European public about vaccines and vaccination.

http://www.enova-adjuvant.eu

European Energy Poverty: Agenda Co-Creation and Knowledge Innovation

CHAIR: Prof Stefan Bouzarovski (NL)
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FUNDING PERIOD: November 2017 – May 2022

SUMMARY

Energy poverty (EP) – commonly understood as a household's inability to secure socially- and materially-necessitated levels of energy services in the home – is prevalent across Europe. More than 50 million households in the European Union are struggling to attain adequate warmth, pay their utility bills on time, and live in homes free of damp and mould. These conditions adversely affect people's health and well-being. Recognition of EP is growing across Europe, and the issue has been identified as a policy priority by a number of EU institutions, including the Energy Union Framework. Yet there has been a chronic lack of integrated discussion and interpretation of the problem within relevant scientific and policy communities. This has prevented the development of systematic understandings and effective policy responses. The core aim of this Action is to radically transform the extent and depth of scientific knowledge about EP in Europe. It will generate a step change in how EP is theorised, detected and addressed. This will be achieved by establishing multidisciplinary collaborations at the nexus of several domains in which EP has been treated separately to date – human geography, energy studies, economics, sociology and political science. The Action will also produce innovative methods for knowledge exchange among academics, public policy officials, civil society and representatives of vulnerable households, while fostering a new generation of scholars. It will offer a unified platform to harness the analytical insights and resources produced by the large but highly fragmented landscape of funded research projects on EP in Europe.

http://www.engager-energy.net/

European Cleft and Craniofacial Initiative for Equality in Care

CHAIR: Prof Martin Persson (SE) martin.j.persson@hkr.se
FUNDING PERIOD: October 2017 – April 2022

SUMMARY

The main aim of the Action is to ensure that children born with orofacial clefts and other craniofacial conditions receive optimum multidisciplinary care enabling them to grow up like any other child and attain equal status within their societies. Estimates indicate that there are over 1,000,000 individuals with clefts in Europe – a significant figure, especially considering that not only the patients but also their families are affected in terms of psychosocial adjustment and having to endure the burden of a long treatment pathway. The Action will work, in particular, with COST Inclusiveness Target Countries where there are limited or no national protocols in cleft and craniofacial care and, via healthcare research, will develop health-integrated networks to manage and oversee the development of cleft and craniofacial services. Europe currently lacks a harmonised approach to evaluating the care provided and the key impacts on the affected families and society at large. This Action will coordinate and increase research across Europe and will forge crucial links between researchers, practitioners and policymakers, offering the potential for significant benefits to the families affected by orofacial clefts and other craniofacial conditions in Europe.

http://ecce.nu/

Performance and Reliability of Photovoltaic Systems: Evaluations of Large-Scale Monitoring Data

CHAIR: Prof Angele Reinders (NL)
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FUNDING PERIOD: October 2017 – April 2022

SUMMARY

The aim of this Action is to improve the energy performance and reliability of photovoltaic (PV) solar energy systems in Europe. This will lead to lower costs of the electricity produced by PV systems due to a higher energy yield, a longer lifetime eventually beyond the guaranteed 20 years as specified by manufacturers, and a reduction in the perceived risk in investments in PV projects. This objective will be achieved by analysing data of the actual monitored long-term performance, defects and failures in PV systems installed all over Europe to quantitatively determine the absolute influences of components' rated performance, the key design of systems, installation, operation, maintenance practice, geographic location and weather factors on the performance, performance degradation over time and failure modes of these PV systems. Despite the rapidly growing PV systems market, to date an Action on PV system performance and reliability has yet to be established. On the other hand, it is very important to ensure the performance of PV systems to achieve long-term goals for them in the future single energy market, such as economic viability, securing investments, environmental sustainability, and security and predictability of supply. Our aim is particularly suited to a COST Action as it entails the formation of an inclusive network of PV system researchers, data resources that will be analysed by researchers, forming the largest-ever agglomeration of PV systems performance data in Europe, and experts who can include more-nuanced evidence-based reliability in PV system evaluation methods and simulation and design tools.

https://www.pearlpv-cost.eu/

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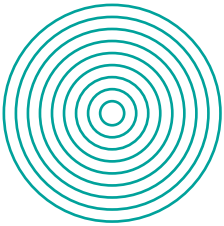

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