

# **COST Actions approved by the Committee of Senior Officials on 23 June 2017**

**Open Call - collection date 07 December  
2016 (OC-2016-2)**

June 2017

## LIST OF ACTIONS

Action N.	Proposal Title	Page
CA16201	Unraveling new physics at the LHC through the precision frontier	3
CA16202	International Network to Encourage the Use of Monitoring and Forecasting Dust Products	4
CA16203	Stem cells of marine/aquatic invertebrates: from basic research to innovative applications	5
CA16204	Distant Reading for European Literary History	6
CA16205	European Network on Understanding Gastrointestinal Absorption-related Processes	7
CA16206	Empowering the next generation of social enterprise scholars	8
CA16207	European Network for Problematic Usage of the Internet	9
CA16208	Knowledge conversion for enhancing management of european riparian ecosystems and services	10
CA16209	Natural Flood Retention on Private Land	11
CA16210	Maximising Impact of research in NeuroDevelopmental DisorderS	12
CA16211	Reappraising Intellectual Debates on Civic Rights and Democracy in Europe	13
CA16212	Impact of Nuclear Domains On Gene Expression and Plant Traits	14
CA16213	New Exploratory Phase in Research on East European Cultures of Dissent	15
CA16214	The multi-messenger Physics and Astrophysics of neutron Stars	16
CA16215	European network for the promotion of portable, affordable and simple analytical platforms	17
CA16216	Coordination and Harmonization of European Occupational Cohorts	18
CA16217	European network of multidisciplinary research to improve the urinary stents	19
CA16218	Nanoscale coherent hybrid devices for superconducting quantum technologies	20
CA16219	Harmonization of UAS techniques for agricultural and natural ecosystems monitoring	21
CA16220	European Network for High Performance Integrated Microwave Photonics	22
CA16221	Quantum Technologies with Ultra-Cold Atoms	23
CA16222	Wider Impacts and Scenario Evaluation of Autonomous and Connected Transport	24
CA16223	Leukemia Gene Discovery by data sharing, mining and collaboration	25
CA16224	European Raptor Biomonitoring Facility	26
CA16225	Realising the therapeutic potential of novel cardioprotective therapies	27
CA16226	Indoor living space improvement: Smart Habitat for the Elderly.	28
CA16227	Investigation and Mathematical Analysis of Avant-garde Disease Control via Mosquito Nano-Tech-Repellents	29
CA16228	European Network for Game Theory	30
CA16229	European Network for Environmental Citizenship	31
CA16230	Combating anthelmintic resistance in ruminants	32
CA16231	European Network of Vaccine Adjuvants	33
CA16232	European Energy Poverty: Agenda Co-Creation and Knowledge Innovation	34
CA16233	Drylands facing change: interdisciplinary research on climate change, food insecurity, political instability	35
CA16234	European Cleft and Craniofacial Initiative for Equality in Care	36
CA16235	Performance and Reliability of Photovoltaic Systems: Evaluations of Large-Scale Monitoring Data	37

## CA16201 - UNRAVELING NEW PHYSICS AT THE LHC THROUGH THE PRECISION FRONTIER

### SUMMARY

Elementary particle physics is currently described by the Quantum Field Theory (QFT) called the Standard Model (SM). The SM, being an apparent success, is well known to be theoretically incomplete. Fundamental questions underlying the quantum structure of Yang-Mills theories are still unanswered. The SM does neither account for mass hierarchies nor for dark matter or dark energy. Most importantly it cannot remain valid to arbitrarily high energies and does not include gravity. After the confirmation of the Higgs boson's existence, entirely new questions come into the focus in the field.

The key to address those questions is to confront experimental data to theoretical predictions with the highest possible precision. The current LHC data do not show a clear signal of new physics. Therefore, any evidence is expected to appear as a tiny deviation from the SM. Precision phenomenology is the necessary prerequisite for theory and collider physics in the coming years and it will be the driving element in the development of new and innovative tools and algorithms to perform a meaningful comparison between theory and data.

The aim of this Action is to shift the precision frontier to a new level of accuracy and to create new resources of networking and innovation, with the quest for discovery as the main motivation. It is designed to work through long-standing challenges on the basis of the most encouraging advances in QFT and related areas of pure mathematics and computer science by uniting the leaders of the field in a coherent effort.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Particle physics (theory)</li> <li>● Physical Sciences: Fundamental interactions and fields (theory)</li> <li>● Physical Sciences: Mathematical physics</li> <li>● Computer and Information Sciences: Theory of scientific computing and data processing</li> <li>● Physical Sciences: Particle physics (theory)</li> <li>● Physical Sciences: Fundamental interactions and fields (theory)</li> <li>● Physical Sciences: Mathematical physics</li> <li>● Computer and Information Sciences: Theory of scientific computing and data processing</li> </ul>	<ul style="list-style-type: none"> <li>● LHC</li> <li>● Quantum Field Theory</li> <li>● Fundamental Interactions</li> <li>● LHC</li> <li>● Quantum Field Theory</li> <li>● Fundamental Interactions</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BE, CH, DE, EL, ES, FI, FR, HU, IT, NL, PL, UK (ITC share: 15%)

Participants: 28% ECI/20% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Russian Federation

International Partner Country (IPC): Argentina, Brazil, Mexico, United States

### INDUSTRIAL DIMENSION

SMEs: Germany

## CA16202 - INTERNATIONAL NETWORK TO ENCOURAGE THE USE OF MONITORING AND FORECASTING DUST PRODUCTS

### SUMMARY

Sand and Dust Storms (SDS) are extreme meteorological phenomena that generate significant amounts of airborne mineral dust particles. SDS play a significant role in different aspects of weather, climate and atmospheric chemistry and represent a serious hazard for life, health, property, environment and economy. Understanding, managing and mitigating SDS risks and effects requires fundamental and cross-disciplinary knowledge. Over the last few years, numerical prediction and observational products from ground- and satellite platforms have become prominent at several research and operational weather centres due to growing interest from diverse stakeholders, such as solar energy plant managers, health professionals, aviation and policy makers. Current attempts to transfer tailored products to end-users are not coordinated, and the same technological and social obstacles are tackled individually by all different groups, a process that makes the use of data slow and expensive.

The overall objective of the proposed Action is to establish a network involving research institutions, service providers and potential end users of information on airborne dust. Because, airborne dust transport has multi- and trans-disciplinary effects at local, regional and global scales; the present Action involves a multidisciplinary group of international experts on aerosol measurements, regional aerosol modelling, stakeholders and social scientists. The Action will search to coordinate and harmonise the process of transferring dust observation and prediction data to users as well as to assist the diverse socio-economic sectors affected by the presence of high concentrations of airborne mineral dust.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Atmospheric chemistry and composition</li> <li>● Environmental engineering: Air pollution</li> <li>● Environmental engineering: Remote sensing</li> <li>● Environmental engineering: Risk assessment, prevention and mitigation</li> <li>● Environmental engineering: Databases, data mining, data curation, computational modelling</li> <li>● Earth and related Environmental sciences: Atmospheric chemistry and composition</li> <li>● Environmental engineering: Air pollution</li> <li>● Environmental engineering: Remote sensing</li> <li>● Environmental engineering: Risk assessment, prevention and mitigation</li> <li>● Environmental engineering: Databases, data mining, data curation, computational modelling</li> </ul>	<ul style="list-style-type: none"> <li>● Mineral Dust</li> <li>● Observations</li> <li>● Modelling</li> <li>● International excellence networking</li> <li>● End-user's tailored products</li> <li>● Mineral Dust</li> <li>● Observations</li> <li>● Modelling</li> <li>● International excellence networking</li> <li>● End-user's tailored products</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: BE, CY, DE, EL, ES, FI, FR, IT, NL, NO, PT, RO, RS, TR, UK (ITC share: 33%)

Participants: 43% ECI/25% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Egypt, Jordan, Morocco

International Partner Country (IPC): Brazil, Chile, Japan, Kazakhstan, Namibia, Saudi Arabia, South Africa, United States

### INDUSTRIAL DIMENSION

SMEs: Belgium, France, Italy, United Kingdom

## CA16203 - STEM CELLS OF MARINE/AQUATIC INVERTEBRATES: FROM BASIC RESEARCH TO INNOVATIVE APPLICATIONS

### 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). MISC further participate in aging and regeneration phenomena, including whole-body regeneration, the knowledge of which can be clinically relevant. Up to now, the European MISC-community is highly fragmented and very scarce ties were established with biomedical industries to harness MISC for human welfare.

Thus, this COST action aims at:

- consolidating the fragmented European community working on MISC;
- promoting and coordinating European research on MISC-biology;
- stimulating young, early-stage researchers to approach research on MISC-biology;
- developing, validating, training and EU networking of novel MISC tools and methodologies;
- establishing the MISC discipline in the front interest of biomedical disciplines;
- establishing collaborations with industries to exploit MISC as sources of bioactive molecules.

This will be only achieved through networking activity including workshops, training schools, short-term scientific missions, meetings/symposia, public awareness and devoted websites.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Stem cell biology</li> <li>● Biological sciences: Apoptosis</li> <li>● Biological sciences: Systems evolution, biological adaptation, phylogenetics, systematics</li> <li>● Biological sciences: Cell signalling and cellular interactions</li> <li>● Biological sciences: Environmental and marine biology</li> <li>● Biological sciences: Stem cell biology</li> <li>● Biological sciences: Apoptosis</li> <li>● Biological sciences: Systems evolution, biological adaptation, phylogenetics, systematics</li> <li>● Biological sciences: Cell signalling and cellular interactions</li> <li>● Biological sciences: Environmental and marine biology</li> </ul>	<ul style="list-style-type: none"> <li>● aquatic/marine invertebrates</li> <li>● adult stem cell</li> <li>● regeneration</li> <li>● cell cultures</li> <li>● bioactive molecules</li> <li>● aquatic/marine invertebrates</li> <li>● adult stem cell</li> <li>● regeneration</li> <li>● cell cultures</li> <li>● bioactive molecules</li> </ul>

### COST COUNTRIES

Main Proposer: IT

Network of Proposers: AT, DE, EL, ES, FR, HR, IE, IL, IT, NO, PL, PT, SI, UK (ITC share: 29%)

Participants: 8% ECI/54% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Russian Federation

### INDUSTRIAL DIMENSION

SMEs: Israel

Large companies: Italy

## CA16204 - DISTANT READING FOR EUROPEAN LITERARY HISTORY

### 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, the Action 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:

- build a multilingual European Literary Text Collection (ELTeC), ultimately containing around 2,500 full-text novels in at least 10 different languages, permitting to test methods and compare results across national traditions;
- establish and share best practices and develop innovative computational methods of text analysis adapted to Europe's multilingual literary traditions;
- 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 like libraries will make their holdings 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.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Languages and literature: Literary theory and comparative literature, literary styles</li> <li>● Languages and literature: Linguistics: formal, cognitive, functional and computational linguistics</li> <li>● Languages and literature: Databases, data mining, data curation, computational modelling</li> <li>● Languages and literature: Literary theory and comparative literature, literary styles</li> <li>● Languages and literature: Linguistics: formal, cognitive, functional and computational linguistics</li> <li>● Languages and literature: Databases, data mining, data curation, computational modelling</li> </ul>	<ul style="list-style-type: none"> <li>● distant reading</li> <li>● computational stylistics</li> <li>● literary history</li> <li>● computational linguistics</li> <li>● digital humanities</li> <li>● distant reading</li> <li>● computational stylistics</li> <li>● literary history</li> <li>● computational linguistics</li> <li>● digital humanities</li> </ul>

### COST COUNTRIES

Main Proposer: DE

Network of Proposers: BE, DE, EL, ES, FR, IE, IL, IT, NL, NO, PL (ITC share: 9%)

Participants: 20% ECI/30% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, United States

## CA16205 - EUROPEAN NETWORK ON UNDERSTANDING GASTROINTESTINAL ABSORPTION-RELATED PROCESSES

### 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 absorbed of the drug is affected by various factors including physiological variables, pathological conditions, local differences in gut permeability, the intraluminal behaviour of the formulation, and food effects. This complex interplay determines drug delivery performance and may cause large interindividual variability, but is poorly understood. Furthermore, comparison between drug absorption studies is hampered due to knowledge fragmentation and lack of standardisation across pharmaceutical subdisciplines. As a result, the available knowledge is underutilized 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 focussing on 4 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.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy</li> <li>● Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy</li> </ul>	<ul style="list-style-type: none"> <li>● gastrointestinal tract</li> <li>● oral drug absorption</li> <li>● individual variability</li> <li>● methodology, technology and assays</li> <li>● (patho)physiology</li> <li>● gastrointestinal tract</li> <li>● oral drug absorption</li> <li>● individual variability</li> <li>● methodology, technology and assays</li> <li>● (patho)physiology</li> </ul>

### COST COUNTRIES

Main Proposer: BE

Network of Proposers: BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, NL, PT, RS, SE, SI, UK  
(ITC share: 37%)

Participants: 19% ECI/38% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, United States

### INDUSTRIAL DIMENSION

SMEs: Germany, Netherlands, United Kingdom

Large companies: Belgium, Finland, France, Germany, Netherlands, Switzerland, United Kingdom, United States

## CA16206 - EMPOWERING THE NEXT GENERATION OF SOCIAL ENTERPRISE SCHOLARS

### SUMMARY

Social enterprise (SE) are organizations which combine an entrepreneurial dynamic to provide services or goods with a primacy of social aims. SE naturally cross various types of borders; sectoral (public, business, cooperatives, associations), resources (drawing them from the market, public procurement, grants, and philanthropy) and activity fields (personal services, finance, recycling industry, energy and transport, food supply chains...).

This EMPOWER-SE Action aims at

- (1) contributing to a comprehensive understanding of the diversity of SE models emerging across Europe and globally; their conditions of emergence and development; and their contribution to key industries for the development of sustainable societies by overcoming existing fragmentation in the levels of knowledge from both a geographical and a disciplinary point of view;
- (2) empowering the next generation of SE scholars, focusing on expanding the SE scientific community to less research-intensive countries where it is still embryonic or non-existing; and
- (3) fostering evidence-based policy from local to European levels and supporting the development of SE and their eco-systems in synergy with main industry representatives and stakeholders. The Action will implement networking mechanisms (working groups, conferences, meetings, workshops for policy-makers, local stakeholder talks, short-term scientific missions, training schools, communication tools including stakeholders briefs, and web-based dissemination) to connect fragmented communities and to contribute to closing the gap between the scientific community, policy-makers and society throughout Europe and beyond.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Political Science: Social policies, welfare state</li> <li>● Economics and business: Organization studies</li> <li>● Economics and business: Sustainability</li> <li>● Political Science: Social policies, welfare state</li> <li>● Economics and business: Organization studies</li> <li>● Economics and business: Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>● social enterprise</li> <li>● social economy</li> <li>● third sector</li> <li>● social and societal challenges</li> <li>● social enterprise</li> <li>● social economy</li> <li>● third sector</li> <li>● social and societal challenges</li> </ul>

### COST COUNTRIES

Main Proposer: BE

Network of Proposers: AT, BA, BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IL, IS, IT, MK, NL, NO, PL, PT, RO, RS, SE, SK, TR, UK (ITC share: 43%)

Participants: 53% ECI/64% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Albania, Armenia, Georgia, Lebanon, Russian Federation

International Partner Country (IPC): Australia, Brazil, United States



## CA16207 - EUROPEAN NETWORK FOR PROBLEMATIC USAGE OF THE INTERNET

### SUMMARY

Problematic use of the internet (PUI) and its impact on the health and wellbeing of European citizens represents an emerging challenge for mental health research. The aim of this Cost 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-psycho-social perspective, clarify the brain-based underpinnings 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 together with policy makers, health service planners, patients and carers in an integrated four-year work-plan designed to 1) share knowledge, interchange ideas and best practice to generate common science and technology programmes, 2) address training gaps and build research capacity, 3) strengthen science and technology communication, 4) foster integration of less research-intensive countries and 5) promote new trans-disciplinary, translational approaches to tackle PUI.

In so doing, this COST 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 wellbeing, (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 (PPI) and health and social policy advance.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Health Sciences: Public and environmental health</li> <li>● Clinical medicine: Psychiatric disorders</li> <li>● Psychology: Neuropsychology</li> <li>● Psychology: Cognitive and experimental psychology: perception, action, and higher cognitive processes</li> <li>● Basic medicine: Behavioral neuroscience (e.g. sleep, consciousness, handedness)</li> <li>● Health Sciences: Public and environmental health</li> <li>● Clinical medicine: Psychiatric disorders</li> <li>● Psychology: Neuropsychology</li> <li>● Psychology: Cognitive and experimental psychology: perception, action, and higher cognitive processes</li> <li>● Basic medicine: Behavioral neuroscience (e.g. sleep, consciousness, handedness)</li> </ul>	<ul style="list-style-type: none"> <li>● Internet usage</li> <li>● Compulsive and addictive use of internet</li> <li>● Mental health and well-being</li> <li>● Internet usage</li> <li>● Compulsive and addictive use of internet</li> <li>● Mental health and well-being</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: CH, ES, HU, IL, IT, NL, UK (ITC share: 14%)

Participants: 34% ECI/29% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, Brazil, Canada, China, Japan, South Africa, United States

## CA16208 - KNOWLEDGE CONVERSION FOR ENHANCING MANAGEMENT OF EUROPEAN RIPARIAN ECOSYSTEMS AND SERVICES

### 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 stimulated a steadily growing number of investigations focussing on riparian vegetation. However scientific investigations in this field are proceeding as isolated initiatives that translate to common practices at a very slow rate and with limited input from the 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 complete neglect of vegetation-mediated processes in water policy debates. The limited consideration of riparian vegetation is also demonstrated by the widespread degradation of riparian forest resulting from centuries of water use and environmental pressures exerted by society on rivers. Such degradation motivated many restoration and mitigation projects aiming at the improvement of riparian status. Alas, many have failed because of scarce consideration of vegetation-mediated processes, so that public resources have been ineffectively allocated. In order to address the abovementioned issues, this action aims to establish a baseline in the state of knowledge regarding riparian vegetation, coordinate research efforts, contribute to knowledge conversion from science to practitioners and to COST inclusiveness countries and to promote practitioners research interests in the scientific community.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Terrestrial ecology, land cover change</li> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Agriculture, Forestry, and Fisheries: Sustainable forest management</li> <li>● Agriculture, Forestry, and Fisheries: Conservation biology, ecology, genetics</li> <li>● Agriculture, Forestry, and Fisheries: Non wood forest products - environmental services</li> <li>● Earth and related Environmental sciences: Terrestrial ecology, land cover change</li> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Agriculture, Forestry, and Fisheries: Sustainable forest management</li> <li>● Agriculture, Forestry, and Fisheries: Conservation biology, ecology, genetics</li> <li>● Agriculture, Forestry, and Fisheries: Non wood forest products - environmental services</li> </ul>	<ul style="list-style-type: none"> <li>● vegetation</li> <li>● fluvial processes</li> <li>● ecosystem services</li> <li>● resilient management</li> <li>● water</li> <li>● vegetation</li> <li>● fluvial processes</li> <li>● ecosystem services</li> <li>● resilient management</li> <li>● water</li> </ul>

### COST COUNTRIES

Main Proposer: FR

Network of Proposers: BE, BG, CY, CZ, DK, EL, ES, FI, FR, HU, IE, IS, IT, ME, NO, PL, PT, RO, SE, SI, SK, TR, UK (ITC share: 48%)

Participants: 64% ECI/47% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Algeria, Morocco, Tunisia

International Partner Country (IPC): United States

### INDUSTRIAL DIMENSION

SMEs: France

## CA16209 - NATURAL FLOOD RETENTION ON PRIVATE LAND

### SUMMARY

Climate change increases the frequency and intensity of future flood events, leading to higher costs of flood damages and increasing the public demand for protective measures. Traditional flood protection measures, mainly based on grey infrastructure (i.e. dikes, 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, they also provide additional ecosystem services including increased 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. The reconciliation of flood risk management and land management is needed. Since all NWRM primarily need to be implemented on private land the consideration of multiple aspects includes: economic issues (e.g. how to compensate for or incentivize 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 of public subsidies (e.g. how to integrate/mainstream flood retention in agricultural subsidies). LAND4FLOOD cost 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 field.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Social and economic geography: Spatial development, land use, regional planning</li> <li>● Economics and business: Public economics, political economics</li> <li>● Environmental engineering: Risk assessment, prevention and mitigation</li> <li>● Social and economic geography: Spatial development, land use, regional planning</li> <li>● Economics and business: Public economics, political economics</li> <li>● Environmental engineering: Risk assessment, prevention and mitigation</li> </ul>	<ul style="list-style-type: none"> <li>● land management</li> <li>● property rights</li> <li>● flood damage reduction</li> <li>● flood storage</li> <li>● land management</li> <li>● property rights</li> <li>● flood damage reduction</li> <li>● flood storage</li> </ul>

### COST COUNTRIES

Main Proposer: CZ

Network of Proposers: AT, BE, BG, CZ, DE, EL, ES, FR, HU, IL, LV, NL, PL, PT, RO, RS, SE, SI, SK, UK (ITC share: 50%)

Participants: 52% EC/48% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Belarus, Ukraine

International Partner Country (IPC): Australia, United States

### INDUSTRIAL DIMENSION

SMEs: Bulgaria, Hungary, Spain

## CA16210 - MAXIMISING IMPACT OF RESEARCH IN NEURO DEVELOPMENTAL DISORDERS

### SUMMARY

This Action focuses on patients with rare neurodevelopmental disorders (NDD) whose study have the potential for 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 high impact on healthcare systems, economic development and society. Lack of mechanistic knowledge hampers development of improved treatments. New knowledge from psychiatric genomics provides for the first time 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 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 the study of subgroup 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 mechanistic understanding and develop new therapies. However, NDD patients with these CNV are rare and require a 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 standardized protocols and establish effective mechanisms for effective data sharing and knowledge exchange.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Clinical medicine: Psychiatric disorders</li> <li>● Basic medicine: Genetic epidemiology</li> <li>● Basic medicine: Neuropsychology</li> <li>● Basic medicine: Stem cell biology</li> <li>● Clinical medicine: Psychiatric disorders</li> <li>● Basic medicine: Genetic epidemiology</li> <li>● Basic medicine: Neuropsychology</li> <li>● Basic medicine: Stem cell biology</li> </ul>	<ul style="list-style-type: none"> <li>● Neurodevelopmental disorders (NDD)</li> <li>● Autism Spectrum Disorders (ASD)</li> <li>● Schizophrenia</li> <li>● Psychiatric genomics</li> <li>● Copy Number Variants</li> <li>● Neurodevelopmental disorders (NDD)</li> <li>● Autism Spectrum Disorders (ASD)</li> <li>● Schizophrenia</li> <li>● Psychiatric genomics</li> <li>● Copy Number Variants</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: BE, BG, CH, DE, DK, FR, IE, NL, RO, RS, SE, UK (ITC share: 25%)

Participants: 37% ECI/48% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Canada

### INDUSTRIAL DIMENSION

SMEs: Switzerland, United Kingdom

Large companies: Denmark

## CA16211 - REAPPRAISING INTELLECTUAL DEBATES ON CIVIC RIGHTS AND DEMOCRACY IN EUROPE

### SUMMARY

Imagining the relations of civic rights and democracy as self-evident and unproblematic disregards their plural argumentative uses, the dissensual features of their conceptual and institutional relationship, their national legal and political traditions both divergent and intertwining, and the many obstacles that hinder their common fulfilments in practice.

Those conditions pose a prior challenge to intellectual debates whose character and value are usually seen as hardly relevant to European politics. The COST Action aims at recasting the interface between intellectual debates, public debates, politics, and policy action with the contributions of more argumentatively- and historically-oriented social science accounts and better institutionally-, politically- and legally-informed humanities research.

Since the early nineties, the responses of European democracies to the growing conflicting claims on civic rights of individuals and groups in secularized societies framing new forms of ethnic, religious, and civil diversity, have been theorized largely in unrelated spheres. By advancing this form of cooperative research, the Action seeks to provide new insights into the links (theoretical, political, and institutional) between civic rights and democracy in Europe. Widening their perspective of analysis and deepening their transnational understanding become a constructive condition to engage scholars as well as social and political agents in RECAST debates, with the aim of better informing political reform.

Drawn on a transnational, cooperative network, such interdisciplinary endeavour will contribute to bridge the gap that separates politics and policy action from humanities and social science research focused on the intricate relations between civic rights and the practices of democracy in Europe.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Philosophy, Ethics and Religion: Ethics and morality, social ethics</li> <li>● History and Archeology: History of ideas, intellectual history, history of science and technology</li> <li>● Political Science: Democratization, social movements</li> <li>● History and Archeology: Colonial and post-colonial history, global and transnational history</li> <li>● Philosophy, Ethics and Religion: Ethics and morality, social ethics</li> <li>● History and Archeology: History of ideas, intellectual history, history of science and technology</li> <li>● Political Science: Democratization, social movements</li> <li>● History and Archeology: Colonial and post-colonial history, global and transnational history</li> </ul>	<ul style="list-style-type: none"> <li>● Civic rights and the practice of democracy</li> <li>● Claims to civic rights in European democracies</li> <li>● Humanities and social sciences cooperative research</li> <li>● Intellectual debates, politics, and policy action</li> <li>● Entangled European history and democratization</li> <li>● Civic rights and the practice of democracy</li> <li>● Claims to civic rights in European democracies</li> <li>● Humanities and social sciences cooperative research</li> <li>● Intellectual debates, politics, and policy action</li> <li>● Entangled European history and democratization</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BG, CZ, DE, ES, FI, FR, HU, IL, IT, NL, NO, PL, PT, SE, TR, UK (ITC share: 35%)

Participants: 42% ECI/32% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Russian Federation

International Partner Country (IPC): South Africa

## CA16212 - IMPACT OF NUCLEAR DOMAINS ON GENE EXPRESSION AND PLANT TRAITS

### SUMMARY

Plants are vital to human life and health and are essential to mitigate the effects of climate change. Due to their sessile lifestyle, plants have developed the ability to rapidly adapt their genome expression in response to environmental challenges. Multiple lines of evidence indicate that spatial (3D) organization of nuclear DNA is critical in this adaptation process and the Impact of Nuclear Domains On Gene Expression and Plant Traits (INDEPTH) network will decipher how nuclear architecture, chromatin organization and gene expression are connected and modified in response to internal and external cues. To address this challenge, the INDEPTH Action gathers a pan-European network addressing this by bringing state-of-the-art technologies and fostering multidisciplinary approaches at research, training, education and industrial levels in high- and super-resolution microscopy, 3D image analysis and software development, chromatin domain mapping, genomics, bioinformatics and plant phenotyping. Standard protocols and procedures will be defined in these fields of competence and relevant -omics and 3D images datasets will be deposited in a public repository for inter-laboratory benchmarking and teaching. INDEPTH will promote early career researchers and foster exchange of skills, techniques and know-how between partners through Short Term Scientific Missions and Training Schools. Industrial partners developing software for microscopic devices, new expression technologies or plant varieties with enhanced yield adapted to climate change will integrate INDEPTH outputs for commercial developments. INDEPTH will ultimately lead to a better understanding of agriculturally relevant challenges such as complex plant traits and their interactions with the environment in the context of climate change.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Biological sciences: Epigenetics and gene regulation</li> <li>● Biological sciences: Proteomics</li> <li>● Biological sciences: Plant biology, Botany</li> <li>● Biological sciences: Epigenetics and gene regulation</li> <li>● Biological sciences: Proteomics</li> <li>● Biological sciences: Plant biology, Botany</li> </ul>	<ul style="list-style-type: none"> <li>● Nuclear architecture</li> <li>● chromatin domains</li> <li>● 3D-imaging</li> <li>● Functional genomics</li> <li>● crop improvement</li> <li>● Nuclear architecture</li> <li>● chromatin domains</li> <li>● 3D-imaging</li> <li>● Functional genomics</li> <li>● crop improvement</li> </ul>

### COST COUNTRIES

Main Proposer: FR

Network of Proposers: AT, BE, CH, CZ, DE, ES, FR, HU, IE, IT, NL, PL, SE, TR, UK (ITC share: 27%)

Participants: 12% ECI/35% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Russian Federation, Tunisia

International Partner Country (IPC): Japan, United States

### INDUSTRIAL DIMENSION

SMEs: Belgium, France, United Kingdom

Large companies: Germany, Switzerland

## CA16213 - NEW EXPLORATORY PHASE IN RESEARCH ON EAST EUROPEAN CULTURES OF DISSENT

### SUMMARY

Resistance and dissent in former socialist Europe 1945-1989 constitutes a remarkable chapter of Europe's recent past, which not only informs in a decisive way 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 fell short of its true significance. This state of affairs results from (1) the inheritance of Cold War-era conceptual distinctions, (2) confinement of research within national silos and (3) 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 through 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. The Action will enable participant researchers to train with cutting edge digital tools, and to increase their capacities for creative dissemination through engaging in productive dialogue with art and cultural heritage curators, proposing best practices of cooperation between those three communities of practice.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● History and Archeology: Modern and contemporary history</li> <li>● Other humanities: Cultural heritage, cultural memory</li> <li>● Media and communications: Museums and exhibitions</li> <li>● Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication</li> <li>● Media and communications: Databases, data mining, data curation, computational modelling</li> </ul>	<ul style="list-style-type: none"> <li>● dissent under communism 1945-1989</li> <li>● post-socialist memory culture</li> <li>● digital humanities</li> <li>● art and cultural heritage curatorship</li> <li>● civic education</li> </ul>

### COST COUNTRIES

Main Proposer: PL

Network of Proposers: BA, BG, CH, CZ, DE, EL, ES, HR, HU, IE, IT, LT, LV, NL, NO, PL, RO, RS, SK, UK (ITC share: 55%)

Participants: 60% EC/47% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Ukraine

### INDUSTRIAL DIMENSION

SMEs: Netherlands



## CA16214 - THE MULTI-MESSENGER PHYSICS AND ASTROPHYSICS OF NEUTRON STARS

### SUMMARY

The recent discovery of gravitational waves will allow in the following years 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 the strong and weak interaction 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 from particle and nuclear physics to astrophysics, from experiment to theory, from gravitational waves to the electromagnetic spectrum. PHAROS has the ambitious goal of attacking key challenges in the physics involved in neutron stars by facing them via an innovative, problem based approach, focussing on current, and new, data and experiments, and that hinges on interdisciplinary Working Groups. Each group will have all the diversified expertise that is needed to tackle different aspects of the data and physics of neutron stars, and will deliver to the different communities several tools and deliverables 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 that will grow and spread the Action's innovative multi-disciplinary approach, with a special attention of promoting Inclusiveness Target Countries.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Nuclear astrophysics (theory)</li> <li>● Physical Sciences: Astrophysics, astronomy, space sciences</li> <li>● Physical Sciences: Gravitational astronomy</li> <li>● Physical Sciences: Relativistic astrophysics</li> <li>● Physical Sciences: High energy and particles astronomy, X-rays, cosmic rays, gamma rays, neutrinos</li> <li>● Physical Sciences: Nuclear astrophysics (theory)</li> <li>● Physical Sciences: Astrophysics, astronomy, space sciences</li> <li>● Physical Sciences: Gravitational astronomy</li> <li>● Physical Sciences: Relativistic astrophysics</li> <li>● Physical Sciences: High energy and particles astronomy, X-rays, cosmic rays, gamma rays, neutrinos</li> </ul>	<ul style="list-style-type: none"> <li>● compact objects</li> <li>● gravitational physics</li> <li>● nuclear and subnuclear physics</li> <li>● relativity</li> <li>● astrophysics</li> <li>● compact objects</li> <li>● gravitational physics</li> <li>● nuclear and subnuclear physics</li> <li>● relativity</li> <li>● astrophysics</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: BE, BG, CH, CZ, DE, EL, ES, FR, HU, IE, IL, IT, NL, PL, PT, RO, SI, SK, TR, UK (ITC share: 45%)

Participants: 31% ECI/57% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Egypt, Russian Federation, Ukraine

International Partner Country (IPC): Australia, Canada, Chile, India, Japan, Mexico, United States



## CA16215 - EUROPEAN NETWORK FOR THE PROMOTION OF PORTABLE, AFFORDABLE AND SIMPLE ANALYTICAL PLATFORMS

### 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 allowed 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 big and expensive instruments. It is therefore of economic and societal interest to facilitate and promote a wider use of such analyticals platforms. Having low budget organisations in mind, such instruments should be affordable and simple to use, allowing their utilisation by inexpert staff. Ideally, they should also be portable allowing their use on site/in the field and be easily carried around.

The portASAP Cost Action (European Network for the Promotion of PORTable, Affordable and Simple Analytical Platforms) aims to work toward this goal by involving scientists working in separation sciences, engineers, chemometricians and other scientific fields, with end-users without expertise in analytical chemistry and instrument manufacturers. PortASAP will provide a platform where analytical needs in applied areas can be matched with expertise. It will also provide formation and promote awareness regarding the potential of low-cost analytical techniques.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Chemical sciences: Analytical chemistry</li> <li>● Chemical sciences: Chemical instrumentation</li> <li>● Chemical sciences: Electrochemistry, electrodialysis, microfluidics, sensors</li> <li>● Chemical sciences: Spectroscopic and spectrometric techniques</li> <li>● Chemical sciences: Analytical chemistry</li> <li>● Chemical sciences: Chemical instrumentation</li> <li>● Chemical sciences: Electrochemistry, electrodialysis, microfluidics, sensors</li> <li>● Chemical sciences: Spectroscopic and spectrometric techniques</li> </ul>	<ul style="list-style-type: none"> <li>● Lab on a chip</li> <li>● Capillary electrophoresis</li> <li>● Forensic</li> <li>● Agri/food</li> <li>● Pharmaceutical</li> <li>● Lab on a chip</li> <li>● Capillary electrophoresis</li> <li>● Forensic</li> <li>● Agri/food</li> <li>● Pharmaceutical</li> </ul>

### COST COUNTRIES

Main Proposer: PT

Network of Proposers: BG, CH, CZ, EE, EL, ES, FI, FR, IE, IT, LV, PT, RO, SE, SK, UK (ITC share: 44%)

Participants: 45% ECI/39% Women

### INTERNATIONAL COOPERATION

International Organisations (IO)

### INDUSTRIAL DIMENSION

SMEs: Bulgaria, France, Italy, Spain, United Kingdom

## CA16216 - COORDINATION AND HARMONIZATION OF EUROPEAN OCCUPATIONAL COHORTS

### SUMMARY

Occupation and paid employment is an essential component of adult life and a major determinant 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 hampers the optimal exploitation of these resources, essential to underpin evidence-based interventions and policy. The overarching concept of the Network on the Coordination and Harmonization of European Occupational Cohorts (OMEGA-NET) is to create a network to optimize the use of occupational, industrial, and population cohorts at the European level. OMEGA-NET will advance i) collaboration of existing cohorts, with extensive contemporary information on employment and occupational exposures, ii) coordination and harmonization 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 harmonization 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 work will provide a 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.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Health Sciences: Occupational medicine</li> <li>● Health Sciences: Epidemiology</li> <li>● Health Sciences: Public and environmental health</li> <li>● Health Sciences: Occupational medicine</li> <li>● Health Sciences: Epidemiology</li> <li>● Health Sciences: Public and environmental health</li> </ul>	<ul style="list-style-type: none"> <li>● Cohort studies</li> <li>● Epidemiology</li> <li>● Occupational health</li> <li>● Exposure assessment</li> <li>● Population</li> <li>● Cohort studies</li> <li>● Epidemiology</li> <li>● Occupational health</li> <li>● Exposure assessment</li> <li>● Population</li> </ul>

### COST COUNTRIES

Main Proposer: NO

Network of Proposers: AT, CH, CY, DE, DK, EE, ES, FI, FR, IT, NL, NO, PL, PT, SE, UK (ITC share: 25%)

Participants: 17% ECI/57% Women

## CA16217 - EUROPEAN NETWORK OF MULTIDISCIPLINARY RESEARCH TO IMPROVE THE URINARY STENTS

### SUMMARY

The indwelling of the urinary stents represents a very frequently used method within the urological practice, in order to ensure the drainage of the urine. Regardless of its composition, polymeric or metallic, it is associated with a high morbidity. Stented patients have functional impairment in many aspects of everyday life, including anxiety, sexual disfunction and desire, loss of labor days, and significant impact in patients' quality of life. This decrease in quality of life increase have a significant negative economic impact, with further cost for medical consultations, hospitalizations, increase the antibiotic, analgesic and alpha-blockers intake to mitigate the side effects of these prothesis.

Therefore, prime objective of this Action is to create a multidisciplinary group to identify the inherent problems in urinary stents, related to its design, composition, biomaterials, coatings, encrustation, interaction between urinary tract-stent and fluid dynamics, physiology effects on urinary tract, assessing the problem from different points of view.

Action members as part of clinical, experimental and bioengineering field, 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 program including scientific/technical, market and social skills contents; this will contribute to strengthen the interactions within the Action consortium and improve the chances of early-career researchers on the job market. Overall, success in this Action will contribute to improved healthy-quality of patients, reduction in health care costs, and increase the competitiveness of the European medical device industry.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Clinical medicine: Urology</li> <li>● Medical engineering: Medical engineering and technology</li> <li>● Materials engineering: Biomaterials, metals, ceramics, polymers, composites</li> <li>● Materials engineering: Fluid dynamics (physics) for materials engineering applications</li> <li>● Clinical medicine: Urology</li> <li>● Medical engineering: Medical engineering and technology</li> <li>● Materials engineering: Biomaterials, metals, ceramics, polymers, composites</li> <li>● Materials engineering: Fluid dynamics (physics) for materials engineering applications</li> </ul>	<ul style="list-style-type: none"> <li>● urinary stent</li> <li>● stents morbidity</li> <li>● computational simulation and in silico</li> <li>● drug eluting stent</li> <li>● urinary tract disorders</li> <li>● urinary stent</li> <li>● stents morbidity</li> <li>● computational simulation and in silico</li> <li>● drug eluting stent</li> <li>● urinary tract disorders</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BE, BG, CH, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IL, IT, LT, MK, NL, NO, PL, PT, RO, SE, TR, UK (ITC share: 41%)

Participants: 45% ECI/31% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Russian Federation

International Partner Country (IPC): Canada, India, South Korea, United States

### INDUSTRIAL DIMENSION

SMEs: Russian Federation, South Korea

Large companies: Croatia, India, United States

## CA16218 - NANOSCALE COHERENT HYBRID DEVICES FOR SUPERCONDUCTING QUANTUM TECHNOLOGIES

### SUMMARY

Superconducting technologies are prime candidates to ripen quantum effects into devices and applications. The accumulated knowledge in decades of work in understanding superconductivity allows scientists now to make experiments by design, controlling relevant parameters in devices. A new field is emerging whose final objective is to improve appliances taking advantage of quantum effects, be it for dissipationless transport of current, 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 behavior 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 program including networking activities with an open, proactive and inclusive approach to 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 optimize European efforts in this area and uncover our full potential, thus maintaining and developing Europe's leading position in superconducting quantum technologies.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Superconductivity (theory)</li> <li>● Nano-technology: Superconductivity for nano-technology applications</li> <li>● Chemical sciences: Chemistry of condensed matter</li> <li>● Physical Sciences: Instrumentation - telescopes, detectors and techniques</li> <li>● Physical Sciences: Nanophysics: nanoelectronics, nanophotonics, nanomagnetism or classify</li> <li>● Physical Sciences: Superconductivity (theory)</li> <li>● Nano-technology: Superconductivity for nano-technology applications</li> <li>● Chemical sciences: Chemistry of condensed matter</li> <li>● Physical Sciences: Instrumentation - telescopes, detectors and techniques</li> <li>● Physical Sciences: Nanophysics: nanoelectronics, nanophotonics, nanomagnetism or classify</li> </ul>	<ul style="list-style-type: none"> <li>● Superconducting nanostructures and materials</li> <li>● Controlling phase, flux and charge in nanoscale devices</li> <li>● Hybrids made of superconducting and magnetic systems</li> <li>● Vortex physics and driving current through superconductors</li> <li>● Low temperatures-high magnetic fields-ultrafast measurements</li> <li>● Superconducting nanostructures and materials</li> <li>● Controlling phase, flux and charge in nanoscale devices</li> <li>● Hybrids made of superconducting and magnetic systems</li> <li>● Vortex physics and driving current through superconductors</li> <li>● Low temperatures-high magnetic fields-ultrafast measurements</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BE, CH, CZ, DE, EE, ES, FI, FR, IL, IT, NL, NO, RO, SE, SI, SK, UK (ITC share: 28%)

Participants: 18% ECI/20% Women

### INDUSTRIAL DIMENSION

SMEs: Germany, Spain

Large companies: Germany

## CA16219 - HARMONIZATION OF UAS TECHNIQUES FOR AGRICULTURAL AND NATURAL ECOSYSTEMS MONITORING

### SUMMARY

Environmental monitoring is a critical issue for comprehending climate impact on natural and agricultural systems, understanding hydrological processes, optimizing water resources, and preventing natural disasters. Nowadays, most of available data is obtained with ground-based measurements or remote sensing that provide limited information in terms of spatial extent or resolution (temporal or spatial). In this context, one of the greatest potential in environmental monitoring is represented by the use of Unmanned Aerial Systems (UASs) whose application and use 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 to extend and improve the description of river basin hydrology, agricultural systems and natural ecosystems affording an impressive level of detail. Several new UAS-based approaches have been recently introduced 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 harmonized in order to enhance our ability to monitor the environment. The Action will co-ordinate efforts to address these issues, by establishing harmonized monitoring practices, enhancing the use of observations by promoting new monitoring strategies, bringing together different communities, facilitating data transfer, upgrading and enlarging knowledge through networking, exchange and training, and linking them to activities in international agencies and global networks.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Environmental engineering: Water management and technology</li> <li>● Environmental engineering: Remote sensing</li> <li>● Earth and related Environmental sciences: Hydrology, water resources</li> <li>● Environmental engineering: Water management and technology</li> <li>● Environmental engineering: Remote sensing</li> </ul>	<ul style="list-style-type: none"> <li>● UAS</li> <li>● Environmental Monitoring</li> <li>● Vegetation</li> <li>● Rivers</li> <li>● Soil water content</li> <li>● UAS</li> <li>● Environmental Monitoring</li> <li>● Vegetation</li> <li>● Rivers</li> <li>● Soil water content</li> </ul>

### COST COUNTRIES

Main Proposer: IT

Network of Proposers: CH, CY, CZ, DE, DK, EL, ES, FR, HU, IL, IT, MT, NO, PT, RS, SE, SI, UK (ITC share: 39%)

Participants: 45% ECI/36% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, Saudi Arabia, United States

### INDUSTRIAL DIMENSION

SMEs: Cyprus, Italy

## CA16220 - EUROPEAN NETWORK FOR HIGH PERFORMANCE INTEGRATED MICROWAVE PHOTONICS

### SUMMARY

The EUIMWP (European Network for High Performance Integrated Microwave Photonics) Action aims to shape and bring the relevant IMWP community supporting coordination and networking actions to consolidate this new ecosystem. EUIMWP will provide exchange of knowledge, ideas and equally important, deliver a portfolio of technological benchmarkings to establish performance indicators and define future technological requirements in high performance scenarios mainly radar, 5G, Internet of Things, automotive and aerospace technologies.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Electrical engineering, electronic engineering, Information engineering: Electrical and electronic engineering of semiconductors, components, systems</li> <li>● Electrical engineering, electronic engineering, Information engineering: Electrical and electronic engineering of semiconductors, components, systems</li> </ul>	<ul style="list-style-type: none"> <li>● Integrated Microwave Photonics</li> <li>● Advanced radio access networks</li> <li>● Photonic aided radar systems</li> <li>● Aerospace systems</li> <li>● Internet of Things</li> <li>● Integrated Microwave Photonics</li> <li>● Advanced radio access networks</li> <li>● Photonic aided radar systems</li> <li>● Aerospace systems</li> <li>● Internet of Things</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BE, CH, CY, CZ, DE, DK, EL, ES, FR, HU, IE, IL, IT, NL, PL, PT, SE, SI, UK (ITC share: 30%)

Participants: 41% ECI/17% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, Brazil, Canada, China, Colombia, Iran, Japan

International Organisations (IO): Netherlands

### INDUSTRIAL DIMENSION

SMEs: Italy, Netherlands, Spain, Switzerland

Large companies: France, Italy

## CA16221 - QUANTUM TECHNOLOGIES WITH ULTRA-COLD ATOMS

### SUMMARY

AtomQT aims at putting Europe in the pole position in the race towards the Second Quantum Revolution. AtomQT's mission is the creation of a large network of expert groups on cold-atom quantum physics that will act as a catalyst in the rapid development and commercialization of quantum technology based on ultra-cold atoms and Bose-Einstein condensates.

The vision is to establish Europe as the leader both in fundamental research as well as real-world commercial products that will harness the unique quantum mechanical features of cold atomic ensembles. This will lead to groundbreaking advances in amongst others metrology, cryptography, communications and computations, biology, and geology. AtomQT will contribute to this development by providing a crucial platform for information exchange and coordination of research. It will also be the catalyst for the fledgling quantum industry.

A further priority of the AtomQT network will be outreach. The education of the general public and the information provided to policy and decision makers and (inter)national regulatory bodies will facilitate considerably the progress of the second quantum revolution and ensure its long term viability.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Physical Sciences: Ultra-cold atoms and molecules</li> <li>● Physical Sciences: Ultra-cold atoms and molecules</li> </ul>	<ul style="list-style-type: none"> <li>● Quantum Technologies</li> <li>● Ultra-Cold Atoms</li> <li>● Quantum Sensors and Applications</li> <li>● Quantum Technologies</li> <li>● Ultra-Cold Atoms</li> <li>● Quantum Sensors and Applications</li> </ul>

### COST COUNTRIES

Main Proposer: EL

Network of Proposers: CY, DE, EL, ES, FR, HR, IT, NO, PL, RS, SI, UK (ITC share: 42%)

Participants: 21% ECI/43% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, China, Singapore, United States

### INDUSTRIAL DIMENSION

SMEs: France, Italy, United States

## CA16222 - WIDER IMPACTS AND SCENARIO EVALUATION OF AUTONOMOUS AND CONNECTED TRANSPORT

### SUMMARY

Autonomous vehicle (AV) trials are currently taking place worldwide and Europe has a key role in the development of relevant technology. Yet, very limited research exists 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 COST Action is on observed and anticipated future mobility trends and implications on travel behaviour, namely car sharing, travel time use or residential location choice to name 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 culminate co - operation between a wide range of stakeholders at a local, national and international level, including academics and practitioners. Consequently, this COST Action will facilitate collaboration within Europe and beyond about this emerging topic of global interest.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Social and economic geography: Transport planning and socio-economic aspects of mobility, transport and logistics</li> <li>● Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication</li> <li>● Computer and Information Sciences: Ethics of computer and information sciences</li> <li>● Civil engineering: Transport engineering</li> <li>● Social and economic geography: Transport planning and socio-economic aspects of mobility, transport and logistics</li> <li>● Media and communications: Media and communications, social aspects of information science and surveillance, socio-cultural communication</li> <li>● Computer and Information Sciences: Ethics of computer and information sciences</li> <li>● Civil engineering: Transport engineering</li> </ul>	<ul style="list-style-type: none"> <li>● autonomous vehicles</li> <li>● connected transport</li> <li>● driverless</li> <li>● wider impacts</li> <li>● scenario development and evaluation</li> <li>● autonomous vehicles</li> <li>● connected transport</li> <li>● driverless</li> <li>● wider impacts</li> <li>● scenario development and evaluation</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: AT, BA, CH, CZ, DE, EL, ES, FI, FR, HR, IE, IL, IT, NL, PL, PT, RO, RS, SE, SK, TR, UK (ITC share: 41%)

Participants: 56% ECI/29% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, Brazil, Canada, United States

### INDUSTRIAL DIMENSION

SMEs: Germany, Portugal, Sweden, United Kingdom



## CA16223 - LEUKEMIA GENE DISCOVERY BY DATA SHARING, MINING AND COLLABORATION

### 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. Also, patients with leukaemia/lymphoma due to genetic factors will often need an adapted treatment strategy because of poor treatment response and/or an increased risk of severe toxicities. To learn as much as possible from and for these patients, international collaboration between leukaemia and lymphoma experts is crucial. Accordingly, a group of paediatric oncologists, geneticists, and scientists from multiple countries in- and outside Europe plan to meet on a regular basis to exchange research strategies and plan joint research 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, and 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, patient and family psychology in a highly significant manner. This international application is a first step in order to promote these broad and critical activities that will be crucial for childhood leukaemia/lymphoma research and improved health care.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Basic medicine: Genomics, comparative genomics, functional genomics</li> <li>● Basic medicine: Genetic epidemiology</li> <li>● Clinical medicine: Oncology</li> <li>● Basic medicine: Genomics, comparative genomics, functional genomics</li> <li>● Basic medicine: Genetic epidemiology</li> <li>● Clinical medicine: Oncology</li> </ul>	<ul style="list-style-type: none"> <li>● Paediatric lymphoid malignancy predisposition</li> <li>● Genotype-phenotype-clinical correlations</li> <li>● Whole genome profiling</li> <li>● Functional models</li> <li>● Candidate gene identification by data sharing and mining</li> <li>● Paediatric lymphoid malignancy predisposition</li> <li>● Genotype-phenotype-clinical correlations</li> <li>● Whole genome profiling</li> <li>● Functional models</li> <li>● Candidate gene identification by data sharing and mining</li> </ul>

### COST COUNTRIES

Main Proposer: NL

Network of Proposers: AT, BE, CZ, DE, DK, ES, FI, FR, HU, IL, IT, LT, NL, PL, RS, SE, TR, UK (ITC share: 33%)

Participants: 23% ECI/43% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Lebanon, Russian Federation

International Partner Country (IPC): Japan

## CA16224 - EUROPEAN RAPTOR BIOMONITORING FACILITY

### SUMMARY

Environmental contaminants impose € multi-billion costs on human and wildlife health. ERBFacility seeks to reduce these costs, meeting pan-European needs for: (a) enhanced effectiveness evaluation of chemicals laws; (b) more reliable risk assessment of compounds, (c) early warning of emerging contaminant problems.

Using raptors as particularly appropriate sentinels for persistent, bioaccumulative and toxic (PBT) compounds, ERBFacility will help answer: (1) is legislation effective in reducing environmental exposure to contaminants in Europe; (2) what are the environmental risks of specific chemicals; (3) are there emerging contaminant problems needing remedial action?

ERBFacility will improve effectiveness evaluation, risk assessment and early warning in relation to regulation of priority substances, plant protection products, biocides, veterinary products and heavy metals.

ERBFacility will deliver linked research coordination and capacity building in three arenas: (1) analysis (academics, laboratories, regulatory agencies); (2) collections (natural history museums, environmental specimen banks and other collections providing samples for analysis); (3) field (gathering samples and relevant contextual data).

ERBFacility is timely and relevant given the shift in chemicals regulation from national to EU level and the 7EAP call for better scientific knowledge for a non-toxic environment. ERBFacility fills a key gap in wildlife biomonitoring and complements recent European developments in human biomonitoring.

ERBFacility 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; proof of concept for pan-European assessments and harmonised sampling.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Environment chemistry</li> <li>● Biological sciences: Population biology, population dynamics, population genetics, plant-animal interactions</li> <li>● Earth and related Environmental sciences: Databases, data mining, data curation, computational modelling</li> <li>● Earth and related Environmental sciences: Environment chemistry</li> <li>● Biological sciences: Population biology, population dynamics, population genetics, plant-animal interactions</li> <li>● Earth and related Environmental sciences: Databases, data mining, data curation, computational modelling</li> </ul>	<ul style="list-style-type: none"> <li>● contaminant</li> <li>● biomonitoring</li> <li>● raptor</li> <li>● risk assessment</li> <li>● ecotoxicology</li> <li>● contaminant</li> <li>● biomonitoring</li> <li>● raptor</li> <li>● risk assessment</li> <li>● ecotoxicology</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: AT, BA, BE, CZ, DE, DK, ES, FI, FR, HR, HU, IT, MT, NL, NO, PL, PT, RO, RS, SE, SI, UK (ITC share: 45%)

Participants: 68% ECI/48% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): United States

## CA16225 - REALISING THE THERAPEUTIC POTENTIAL OF NOVEL CARDIOPROTECTIVE THERAPIES

### SUMMARY

Ischemic heart disease (IHD) and the heart failure that often results are the leading causes of death and disability in Europe and worldwide. As such, new treatments are required to protect the heart against acute ischemia/reperfusion injury (IRI) in order to preserve cardiac function and prevent the onset of heart failure – a strategy termed ‘Cardioprotection’. Yet, 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 arena for patient benefit.

The proposed COST Action (EU-CARDIOPROTECTION) 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 4 main objectives (each linked to a Working Group [WG]):

- (1) To use innovative strategies to discover novel targets for cardioprotection (WG1 NEW TARGETS).
- (2) To investigate the effects of combination therapy directed to multiple targets as an innovative cardioprotective strategy (WG2 COMBINATION THERAPY).
- (3) To use more clinically relevant animal models for testing novel cardioprotective therapies which take into account the confounding effects of co-morbidities and co-medication (WG3 CONFOUNDERS).
- (4) To set up a European network of research centers for: (a) Multi-center preclinical testing of novel cardioprotective therapies using small/large animal and human models of acute myocardial IRI; and (b) Proof-of-concept clinical testing of novel cardioprotective therapies in patients with IHD (WG4 CONSORTIUM).

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy</li> <li>● Clinical medicine: Cardiovascular diseases</li> <li>● Basic medicine: Pharmacology, pharmacogenomics, drug discovery and design, drug therapy</li> <li>● Clinical medicine: Cardiovascular diseases</li> </ul>	<ul style="list-style-type: none"> <li>● Cardioprotection</li> <li>● Myocardial infarction</li> <li>● Ischemia and reperfusion injury</li> <li>● Animal models</li> <li>● Ischemic conditioning</li> <li>● Cardioprotection</li> <li>● Myocardial infarction</li> <li>● Ischemia and reperfusion injury</li> <li>● Animal models</li> <li>● Ischemic conditioning</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: AT, CH, CZ, DE, DK, EE, EL, ES, FR, HU, IE, IT, LT, LV, NL, NO, PL, PT, RO, RS, SE, SK, UK (ITC share: 43%)

Participants: 10% ECI/31% Women

### INDUSTRIAL DIMENSION

SMEs: Greece, Hungary

## CA16226 - INDOOR LIVING SPACE IMPROVEMENT: SMART HABITAT FOR THE ELDERLY

### SUMMARY

By 2050, the number of people in the EU aged 65 and above 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.

Improving accessibility, functionality, and safety at home, at work and in society in general requires combining many disciplines together 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, it also can significantly improve the accessibility of the built environment for the elderly by integrating ICT solutions, ergonomic design, and taking into account the health needs of the elderly more completely.

The present Action will be a science and technology network where relevant actors from academic, research and industry sectors will utilise networking tools and activities to address the aging population challenges facing Europe, helping to reduce 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 aging population while promoting healthy and safe ageing.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Electrical engineering, electronic engineering, Information engineering: Sensors and sensor systems</li> <li>● Health Sciences: Health services, health care research</li> <li>● Mechanical engineering: Product design, ergonomics, mechanical engineering aspects of man-machine interfaces</li> <li>● Electrical engineering, electronic engineering, Information engineering: Sensors and sensor systems</li> <li>● Health Sciences: Health services, health care research</li> <li>● Mechanical engineering: Product design, ergonomics, mechanical engineering aspects of man-machine interfaces</li> </ul>	<ul style="list-style-type: none"> <li>● Furniture</li> <li>● Elderly</li> <li>● ICT</li> <li>● Habitat</li> <li>● Healthcare</li> <li>● Furniture</li> <li>● Elderly</li> <li>● ICT</li> <li>● Habitat</li> <li>● Healthcare</li> </ul>

### COST COUNTRIES

Main Proposer: ES

Network of Proposers: AT, BE, CZ, DE, EL, ES, FI, FR, HU, IT, NO, PL, PT, RO, RS, SI (ITC share: 44%)

Participants: 68% ECI/48% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Ukraine

### INDUSTRIAL DIMENSION

Large companies: France

## CA16227 - INVESTIGATION AND MATHEMATICAL ANALYSIS OF AVANT-GARDE DISEASE CONTROL VIA MOSQUITO NANO-TECH-REPELLENTS

### SUMMARY

IMAAC aims at investigation and mathematical analysis of the effect of avant-garde control measures in vector-borne diseases involving day-time active mosquitos 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 well portioned dosage. The study will also be expanded to scenarios using vaccines in combination with 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, but the application will have also 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 in a well-controlled rate. First attempts in this direction have been made, but no efficacy studies could be performed yet. The spectrum of combinations of nano- or micro-particles, repellents, insecticides and types of textiles (or paint) has not been well studied. Especially, efficacy studies in cases using these control measures in combination with vaccines are uncharted territories and mathematical modelling has to be developed.

This Action aims to bring together experts from epidemiology, biostatistics, mathematics, biology, nano-technology, chemical and textile engineering to implement new techniques to combat mosquito transmitted vector-borne diseases. The key question remains, in how far such avant-garde measures can help to reduce the disease burden, eventually in collaboration with existing vaccines which turned out to have only limited efficacy on their own.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Mathematics: Statistics</li> <li>● Biological sciences: Biostatistics</li> <li>● Chemical engineering: Medicinal chemistry, drug synthesis</li> <li>● Materials engineering: Nanophysics for materials engineering applications</li> <li>● Mathematics: Statistics</li> <li>● Biological sciences: Biostatistics</li> <li>● Chemical engineering: Medicinal chemistry, drug synthesis</li> <li>● Materials engineering: Nanophysics for materials engineering applications</li> </ul>	<ul style="list-style-type: none"> <li>● Epidemiology and Modelling</li> <li>● Disease Control Measures</li> <li>● Vector-borne Diseases</li> <li>● Mosquito</li> <li>● Dengue Fever</li> <li>● Epidemiology and Modelling</li> <li>● Disease Control Measures</li> <li>● Vector-borne Diseases</li> <li>● Mosquito</li> <li>● Dengue Fever</li> </ul>

### COST COUNTRIES

Main Proposer: PT

Network of Proposers: DE, FI, HR, IT, NL, PT, RO, UK (ITC share: 38%)

Participants: 42% ECI/35% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Canada, India, Indonesia, Tanzania, United States

### INDUSTRIAL DIMENSION

SMEs: Canada, Germany, India, Portugal, United States

## CA16228 - EUROPEAN NETWORK FOR GAME THEORY

### SUMMARY

With the rapid advancement of technological innovations, modern societies rely more and more on the proper functioning of complex networks (i.e., social, telecommunication and transportation networks). Since the state and the dynamics of these networks are determined by independent decision makers, a solid understanding, control and optimization of such networked systems constitutes a major challenge for modern societies.

Game theoretic concepts are nowadays 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 the 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, our 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 this 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 be 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. On a meta-level, the aim is to create a broad community of game theorists across Europe and at every stage of their career and to facilitate contact with stakeholders.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Mathematics: Control theory and optimization</li> <li>● Computer and Information Sciences: Theoretical computer science and formal methods</li> <li>● Economics and business: Microeconomics, institutional economics</li> <li>● Mathematics: Control theory and optimization</li> <li>● Computer and Information Sciences: Theoretical computer science and formal methods</li> <li>● Economics and business: Microeconomics, institutional economics</li> </ul>	<ul style="list-style-type: none"> <li>● Game Theory</li> <li>● Networks</li> <li>● Algorithms</li> <li>● Economic Engineering</li> <li>● Mathematical Programming</li> <li>● Game Theory</li> <li>● Networks</li> <li>● Algorithms</li> <li>● Economic Engineering</li> <li>● Mathematical Programming</li> </ul>

### COST COUNTRIES

Main Proposer: NL

Network of Proposers: AT, BE, CH, CY, CZ, DE, DK, EL, ES, FR, HU, IL, IT, NL, PT, RO, SE, UK (ITC share: 28%)

Participants: 29% ECI/40% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Canada, Singapore, United States

## CA16229 - EUROPEAN NETWORK FOR ENVIRONMENTAL CITIZENSHIP

### SUMMARY

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 Sustainable Development, Green and Cycle economy and Low-carbon society (EU-roadmap 2050). The Integrated Network of the Action 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 different macro- and micro- level dimensions of formal and non-formal education that could lead to Environmental Citizenship will be focused. By developing National, European and International collaborations ENEC will enhance the scientific knowledge and attention to Environmental Citizenship. Expected deliverables include: a) the creation of a web-site, b) a depository database of scientific measures and evidence based interventions that target Environmental Citizenship, c) the facilitation of scientific training schools, short term scientific missions, 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 conceptualize and frame the Environmental Citizenship and will develop new research paradigms and metrics for assessing the Environmental Citizenship. 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 in Environmental Citizenship.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Educational sciences: Education: training, pedagogy, didactics</li> <li>● Educational sciences: Education: training, pedagogy, didactics</li> </ul>	<ul style="list-style-type: none"> <li>● Environmental Citizenship</li> <li>● Environmental Attitudes</li> <li>● Environmental Behaviour</li> <li>● Formal Education</li> <li>● Non-Formal Education</li> <li>● Environmental Citizenship</li> <li>● Environmental Attitudes</li> <li>● Environmental Behaviour</li> <li>● Formal Education</li> <li>● Non-Formal Education</li> </ul>

### COST COUNTRIES

Main Proposer: CY

Network of Proposers: BE, CY, CZ, EL, ES, IL, IT, NL, PL, PT, SE, UK (ITC share: 33%)

Participants: 33% ECI/47% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): United States



## CA16230 - COMBATTING ANTHELMINTIC RESISTANCE IN RUMINANTS

### SUMMARY

Helminth parasitic pathogens cause severe disease and are amongst the most important production-limiting diseases of grazing ruminants. Frequent anthelmintic use to control these infections has resulted in the selection of drug resistant helminth populations. Anthelmintic resistance (AR) is today found in all major helminth species across Europe and globally. COMBAR will advance research on the prevention of anthelmintic resistance in helminth parasites of ruminants in Europe and disseminate current knowledge among all relevant stakeholders. By gathering parasitologists, social scientists and agricultural economists, COMBAR will bring together a multi-disciplinary blend of scientists that do normally rarely interact. Inclusion of SMEs and industry in the consortium will facilitate the dissemination of knowledge and novel technologies to 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 (iv) decision support tools. By evaluating those novel technologies and assessing their economic trade-offs and barriers to uptake in a European coordinated approach, COMBAR will tackle AR.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Veterinary science: Veterinary medicine (miscellaneous)</li> <li>● Veterinary science: Veterinary medicine (miscellaneous)</li> </ul>	<ul style="list-style-type: none"> <li>● anthelmintic resistance</li> <li>● ruminants</li> <li>● diagnostics</li> <li>● socio-economics</li> <li>● sustainable control</li> <li>● anthelmintic resistance</li> <li>● ruminants</li> <li>● diagnostics</li> <li>● socio-economics</li> <li>● sustainable control</li> </ul>

### COST COUNTRIES

Main Proposer: BE

Network of Proposers: BE, CH, CZ, DE, DK, ES, FR, IT, NL, PL, SE, SK, UK (ITC share: 23%)

Participants: 32% ECI/32% Women

### INDUSTRIAL DIMENSION

SMEs: Belgium, United Kingdom



## CA16231 - EUROPEAN NETWORK OF VACCINE ADJUVANTS

### 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 synergize available knowledge on adjuvants and vaccine formulation, and to coordinate their translation into successful, safe and innovative vaccines. Significant effort will be placed on bridging these three separated vaccine fields. This network will significantly strengthen ongoing EC-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 the general public, providing impartial, balanced and scientific information on adjuvants and vaccines. This Action will contribute to the strengthening of 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.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Health Sciences: Infectious diseases</li> <li>● Clinical medicine: Oncology</li> <li>● Veterinary science: Veterinary medicine (miscellaneous)</li> <li>● Clinical medicine: Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)</li> <li>● Health Sciences: Infectious diseases</li> <li>● Clinical medicine: Oncology</li> <li>● Veterinary science: Veterinary medicine (miscellaneous)</li> <li>● Clinical medicine: Prevention and treatment of infection by pathogens (e.g. vaccination, antibiotics, fungicide)</li> </ul>	<ul style="list-style-type: none"> <li>● Adjuvant</li> <li>● Vaccine</li> <li>● Formulation</li> <li>● Delivery system</li> <li>● Adjuvant</li> <li>● Vaccine</li> <li>● Formulation</li> <li>● Delivery system</li> </ul>

### COST COUNTRIES

Main Proposer: CH

Network of Proposers: CH, DE, DK, FR, IE, IS, NL, PL, RO, SE, UK (ITC share: 18%)

Participants: 18% ECI/45% Women

### INDUSTRIAL DIMENSION

SMEs: Germany

Large companies: France

## CA16232 - EUROPEAN ENERGY POVERTY: AGENDA CO-CREATION AND KNOWLEDGE INNOVATION

### 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.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Social and economic geography: Socio-economic aspects of environmental sciences</li> <li>● Social and economic geography: Spatial development, land use, regional planning</li> <li>● Social and economic geography: Socio-economic aspects of environmental sciences</li> <li>● Social and economic geography: Spatial development, land use, regional planning</li> </ul>	<ul style="list-style-type: none"> <li>● Energy poverty</li> <li>● Social inequality</li> <li>● Housing</li> <li>● Energy poverty</li> <li>● Social inequality</li> <li>● Housing</li> </ul>

### COST COUNTRIES

Main Proposer: UK

Network of Proposers: AT, BE, CY, CZ, DE, EL, ES, FR, HR, HU, IT, MK, NL, NO, PL, PT, RS, SI, SK, TR, UK (ITC share: 52%)

Participants: 65% ECI/57% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Australia, New Zealand, South Africa, United States

### INDUSTRIAL DIMENSION

Large companies: Netherlands

## CA16233 - DRYLANDS FACING CHANGE: INTERDISCIPLINARY RESEARCH ON CLIMATE CHANGE, FOOD INSECURITY, POLITICAL INSTABILITY

### SUMMARY

Drylands and their inhabitants are facing complex challenges regarding the development of their economies and productive agricultural systems in the face of climate variability and future climate change, adverse market conditions and political instability. They are the most insecure areas in the world and are home to vast numbers of malnourished people who lack basic services such as education, health care, energy supplies and market access to. Many of these areas are experiencing violence and political instability, and have malfunctioning political institutions that prevent dryland inhabitants from creating their own path to development. As a result many people are on the move to look for a better existence

The main objective is to achieve better research coordination between disciplines (natural science, agriculture, environmental sciences, social sciences, political science, geography, but also across institutional boundaries (European, international and African institutions) in order to create research networks that work together on strategic research (agendas) to develop long-term solutions for problems in dryland areas.

It will do this by forming 4 thematic working groups on 1: The climate – food security – population nexus; 2: The conflict – institutions – natural resource governance nexus; 3: Human development; and 4: Insecurity – youth – global-local linkages in policymaking. Working group 5 will coordinate and safeguard interdisciplinarity.

The action will produce short- and long-term policy briefs, exchange with policy-makers, state-of-art overviews of the identified domains, target strategic research actions for the future, organize training and summer schools for institutions for junior researchers and form strategic research coalitions for further collaboration with local, European and international partners.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Earth and related Environmental sciences: Climatology and climate change</li> <li>● Agriculture, Forestry, and Fisheries: Sustainable production</li> <li>● Sociology: Migration, interethnic relations</li> <li>● Political Science: Political systems and institutions, governance</li> <li>● Political Science: Violence, conflict and conflict resolution</li> <li>● Earth and related Environmental sciences: Climatology and climate change</li> <li>● Agriculture, Forestry, and Fisheries: Sustainable production</li> <li>● Sociology: Migration, interethnic relations</li> <li>● Political Science: Political systems and institutions, governance</li> <li>● Political Science: Violence, conflict and conflict resolution</li> </ul>	<ul style="list-style-type: none"> <li>● Drylands</li> <li>● Climate change</li> <li>● Food insecurity</li> <li>● Migration</li> <li>● Political instability</li> <li>● Drylands</li> <li>● Climate change</li> <li>● Food insecurity</li> <li>● Migration</li> <li>● Political instability</li> </ul>

### COST COUNTRIES

Main Proposer: NL

Network of Proposers: BE, CH, CY, CZ, DE, IL, IT, NL, NO, PL, PT, RO, SE, TR, UK (ITC share: 40%)

Participants: 53% ECI/40% Women

### INTERNATIONAL COOPERATION

International Partner Country (IPC): Chad, Iran, Kenya, Mali, Nigeria

## CA16234 - EUROPEAN CLEFT AND CRANIOFACIAL INITIATIVE FOR EQUALITY IN CARE

### 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 when one considers 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, in particular, will work with Target Inclusiveness Countries where limited or no national protocols exist in cleft and craniofacial care and will, via healthcare research, develop health-integrated networks which will manage and oversee the development of cleft and craniofacial services. Europe currently lacks a harmonised approach to evaluate the current provision of care, the impacts on key areas of the affected families and society at large.

This Action will co-ordinate and increase research across Europe and will forge crucial links between researchers, practitioners and policy-makers, offering the potential for significant benefits to the families affected by orofacial clefts and other craniofacial conditions in Europe.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Health Sciences: Health services, health care research</li> <li>● Clinical medicine: Paediatrics</li> <li>● Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty</li> <li>● Health Sciences: Public and environmental health</li> <li>● Health Sciences: Health services, health care research</li> <li>● Clinical medicine: Paediatrics</li> <li>● Sociology: Social structure, inequalities, social mobility, social exclusion, income distribution, poverty</li> <li>● Health Sciences: Public and environmental health</li> </ul>	<ul style="list-style-type: none"> <li>● Health Care Research</li> <li>● Equality and Policy</li> <li>● Public Health</li> <li>● Medicine</li> <li>● Process - outcome studies</li> <li>● Health Care Research</li> <li>● Equality and Policy</li> <li>● Public Health</li> <li>● Medicine</li> <li>● Process - outcome studies</li> </ul>

### COST COUNTRIES

Main Proposer: NL

Network of Proposers: BG, EE, EL, HR, IL, LV, MK, NL, NO, RO, RS, SI, TR (ITC share: 69%)

Participants: 67% EC/50% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Ukraine

## CA16235 - PERFORMANCE AND RELIABILITY OF PHOTOVOLTAIC SYSTEMS: EVALUATIONS OF LARGE-SCALE MONITORING DATA

### SUMMARY

The aim of this COST Action is to improve the energy performance and reliability of photovoltaic (PV) solar energy systems in Europe leading to lower costs of electricity produced by PV systems by a higher energy yield, a longer life time 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 analyzing 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, 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 market of PV systems, so far a COST Action on PV systems' performance and reliability has not been established. On the other hand it is very important to ensure the performance of PV systems to achieve long term goals for PV systems 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 analyzed by researchers, forming the largest-ever agglomeration of PV systems performance data in Europe, and experts that can include more-nuanced evidence-based reliability in PV system evaluation methods and simulation and design tools.

### SCIENTIFIC SCOPE

Areas of Expertise	Keywords
<ul style="list-style-type: none"> <li>● Environmental engineering: Databases, data mining, data curation, computational modelling</li> <li>● Electrical engineering, electronic engineering, Information engineering: Energy aspects of electrical and electronic engineering</li> <li>● Electrical engineering, electronic engineering, Information engineering: Sustainable engineering</li> <li>● Environmental engineering: Databases, data mining, data curation, computational modelling</li> <li>● Electrical engineering, electronic engineering, Information engineering: Energy aspects of electrical and electronic engineering</li> <li>● Electrical engineering, electronic engineering, Information engineering: Sustainable engineering</li> </ul>	<ul style="list-style-type: none"> <li>● PV systems</li> <li>● Energy performance</li> <li>● Reliability</li> <li>● Monitoring</li> <li>● Evaluation</li> <li>● PV systems</li> <li>● Energy performance</li> <li>● Reliability</li> <li>● Monitoring</li> <li>● Evaluation</li> </ul>

### COST COUNTRIES

Main Proposer: NL

Network of Proposers: AT, BE, CH, CY, DE, DK, EL, ES, FR, IE, IT, NL, NO, PT, RO, SE, SI, UK (ITC share: 22%)

Participants: 47% ECI/26% Women

### INTERNATIONAL COOPERATION

Near Neighbour Country: Armenia, Georgia

### INDUSTRIAL DIMENSION

SMEs: Belgium, France, Spain

Large companies: Austria, Cyprus