



**MARIE SKŁODOWSKA-CURIE ACTIONS
CLUSTER EVENT ON
THE EUROPEAN GREEN DEAL**

6-7 JULY 2021

Acknowledgements

This background booklet contains the programme of the Marie Skłodowska-Curie Action (MSCA) Cluster Event on the European Green Deal, together with the project abstracts, as kindly provided by the event's participants.

The cluster meeting is jointly organised by the MSCA units of the Research Executive Agency, in close cooperation with the Directorate-General for Education, Youth, Sport and Culture.

We thank all the MSCA fellows and coordinators, the REA staff and the colleagues at the participating Directorates Generals for their contribution to this event.

DISCLAIMER: *This material is intended for the use of the meeting to brief the participants. A final report will be made available for wider distribution, after the event. For official publications related to these MSCA projects, please refer to CORDIS (www.cordis.eu).*

FOREWORD

The four Marie Skłodowska-Curie Actions (MSCA) units from the European Research Executive Agency (REA) have joined forces with the Directorate General for Education, Youth, Sport and Culture (DG EAC) to bring you this cluster event and show the contribution of the MSCA projects to the European Green Deal.

Over 100 participants have been invited including project coordinators, researchers, policy makers and policy officers. The latter represent the Directorates General for Education, Youth, Sport, and Culture (DG EAC), Directorate-General for Climate Action (DG CLIMA), Directorate-General for Research and Innovation (DG RTD), Directorate-General for the Environment (DG ENV), Directorate-General for Agriculture (DG AGRI), Directorate-General for Energy (DG ENER), Directorate-General for Mobility and Transport (DG MOVE) and the REA.

The presentations and discussions between the participants aim to:

- showcase the excellence of MSCA researchers and their contribution to the state of the art of research and innovation related to the European Green Deal;
- provide coordinated input to the relevant EU policy-making services, researchers and experts to explore how R&I can help achieve the goals of the European Green Deal;
- enhance synergies among projects based on new scientific insights and stimulate networking opportunities, with an emphasis among MSCA Fellows.

Topics addressed include:

Biodiversity	Eliminating pollution
Sustainable agriculture & soil health	Climate action
Clean energy	Green transport

Moreover, six panel discussions and one virtual exhibition area will engage participants in discussions relevant for both scientific and policy aspects of the European Green Deal. In a final policy roundtable, representatives from the European Commission, European Executive Agencies, the European Institute of Innovation and Technology and the United Nations will share their reflections on the EU contributions of the European Green Deal and the EU funding opportunities for “climate” R&I.

The REA manages a large portfolio of H2020 projects and one of its roles is to provide programme and policy feedback on the funded actions to the European Commission. To this extent, I am proud that the four MSCA units have partnered-up with talented MSCA researchers and engaged policy makers to provide us with an exciting scientific programme and an equally stimulating series of panel discussions on policy areas that can affect our lives in the future.

Begoña Arano

REA - Head of Department Marie Skłodowska-Curie Actions & Support to Experts

PROGRAMME

Monday 5 July

9AM – 6PM VIRTUAL EXHIBITION

The Virtual Exhibition area features excellent Green Deal-related R&I projects funded by the Marie Skłodowska-Curie Actions (MSCA), the European Institute of Innovation and Technology (EIT), the Erasmus+ and Creative Europe programmes.

The winner of the virtual exhibition, based on the highest number of votes, was María del Prado GARCIA-APARICIO (University of Alcalá, Department of Analytical Chemistry, Physical Chemistry and Chemical Engineering & Chemical Research Institute “Andrés M. del Río” - Alcalá de Henares, Spain), presenting the project “Biotechnology approaches for food waste valorisation” (project ID: GOT ENERGY 754382– MSCA COFUND, 2016).

Further information on each project featured in the virtual exhibition can be found in the last section of this booklet.

Tuesday 6 July (DAY 1)

1 – 2.15PM OPENING SESSION

1 – 1.15PM

Welcome messages



Klaus HAUPT (REA)

Chair

Head of Unit REA.A1, MSCA Doctoral Networks, European Research Executive Agency (REA)



Themis CHRISTOPHIDOU
(DG EAC)

Director-General for Education, Culture, Youth and Sport, European Commission (DG EAC)

Themis Christophidou is the Director-General for Education, Youth, Sport and Culture of the European Commission, since March 2018. She is a civil engineer with 35 years of experience in private and public sector management. After having worked in the private sector for 15 years, she joined the European Commission in 2001 and held various positions, including in the Directorate-General for Regional and Urban Policy, as Head of Cabinet of the Commissioner for Maritime Affairs and Fisheries and as Head of Cabinet of the Commissioner for Humanitarian Aid and Crisis Management. Themis Christophidou is an alumna of the civil engineering faculty of the Metsovio Polytechnic University of Athens, specialised in transport infrastructure and urban transport. Born in Famagusta, Cyprus, she is trilingual, fluent in Greek, French, English.



Marc TACHELET (REA)

Director, European Research Executive Agency (REA)

Marc Tachelet took up his first post at the European Institutions in 1994, joining the European Court of Auditors in Luxembourg, with 5 years of experience in the private audit sector and a degree in Business Economics. He moved back to his native Belgium in 1998 to join the central finance unit of DG INFSO (now DG CNECT) at the European Commission. He first became a Head of Unit in 2003, responsible for Financial Resources, Internal Control and Strategic Programming at DG Translation. He then joined DG RTD in 2008, where he was later seconded to the newly established Research Executive Agency (REA) as Head of Department for Administration, Finance and Support and then as Head of Department 'Industrial leadership and societal challenges'. He became Director of REA in April 2017, where he provides strategic direction to a motivated team of managers and staff.

1.15 – 1.30PM

The European Green Deal



Clara DE LA TORRE (DG CLIMA)

Deputy Director-General for Climate Action, European Commission (DG CLIMA)

Since 1 September 2019, Clara de la Torre has held the post of Deputy Director General in the Directorate-General for Climate Action. Previously, she was Director for Transport in the Directorate-General for Research & Innovation. From 2014 to 2016, she was responsible for Key Enabling Technologies, following a 3-year appointment as Director in the field of Research and Innovation. In her first post as a Director, from 2008 to 2010, she was in charge of inter-institutional and legal matters related to the Framework Programme at the European Commission, which she joined in 1987 after some years in the private sector.

Clara de la Torre has a degree in Economics and Business Administration from the Universidad Autónoma of Madrid.

1.30 – 1.45PM



Green Deal research in the Marie Skłodowska-Curie Actions

Begoña ARANO (REA)

Head of Department, European Research Executive Agency (REA)

Begoña Arano is Head of the Department for Marie Skłodowska-Curie Actions & Support to Experts at the European Research Executive Agency. She holds a PhD in Biological Sciences from the Complutense University in Madrid. She worked as a researcher at the Spanish Research Council (C.S.I.C) and was awarded a Marie Curie Fellowship between 1996-1998. In 1998 she joined the European Commission as Scientific Officer within the Unit for Marie Curie Fellowships (Improving Human Potential Programme). From 2007, she was a Head of Unit in the Directorate General for Research and Innovation, where she was successively responsible for the Marie Curie Actions (Networks), Communication, and the International Cooperation with North America, Latin America and the Caribbean. She later became Head of Unit in charge of innovation and the European Institute of Innovation and Technology (EIT), in the Directorate General for Education, Youth, Sport and Culture.

1.45 – 2PM



Scientific leadership towards a sustainable future

**Alexandra DUBINI
(MCAA)**

MSCA Fellow and Board Member of the Marie Curie Alumni Association (MCAA)

Dr. Alexandra Dubini is a distinguished researcher at the University of Córdoba, UCO, Spain. She completed her PhD at the University of East Anglia, UK and then worked 10 years as a permanent scientific researcher at the National Renewable Energy Laboratory (NREL) in Colorado, USA. During her career she benefited from 2 MSCA-COFUND actions, in France and in Spain, which allowed her to return to Europe to continue her investigation. She joined the UCO in 2015, where she is currently the PI of Spanish project “MULTIVALGA” and European project “WABA” that uses consortia of algae bacteria for bioremediation of wastewater and biomass valorization. She also specialized in the production of biofuels and more specifically hydrogen from green algae. Her research combines fundamental research and biotechnological applications. Through her work, she is developing new sustainable energy solutions using microalgae as renewable alternatives. Since 2019, she is part of 2 groups of experts from the European Commission related to Energy and climate, as well as the Environment, circular economy and resource efficiency. In 2020, she was elected as a member of the Marie Curie Association (MCAA) board. Finally, Dr Dubini is an advocate for the ecologic transition but also for women in science. In 2018, she participated in Homeward Bound, the largest-ever all-women expedition to Antarctica to promote women's leadership in climate action.

2 – 2.15PM

Questions & Answers

2.15 – 2.30PM

Break

2.30 – 3.30 PM PARALLEL THEMATIC PANELS (PART 1)

Biodiversity (1A)



Frank MARX (REA)

Chair

Deputy Head of Unit MSCA Doctoral Networks, European Research Executive Agency (REA)



Karolina D'CUNHA (DG ENV)

Moderator

Deputy Head of Unit, Directorate-General for the Environment (DG ENV)

The moderator of this panel is Karolina D'CUNHA, Deputy Head of Unit, Natural Capital- Biodiversity, Directorate-General for the Environment (DG ENV). Previously Karolina has worked on waste policies for over nine years. During her career in DG Environment, she has been responsible for several environmental dossiers. On behalf of the Commission, in 2008 Karolina was negotiating with the European Parliament and the Council regarding the revision of the Waste Framework Directive - the cornerstone piece of European legislation on waste.



Ana RODRIGUES (Centre National de la Recherche Scientifique)

International training at the science-policy interface for researchers in Europe, for nature (Inspire4Nature) - MSCA Innovative Training Network (2017) project ID: [766417](#)

Dr. Ana Rodrigues is a CNRS Research Director and the Head of the Department Dynamics & Conservation of Biodiversity, Center for Functional and Evolutionary Ecology (Montpellier, France). She is also the Scientific Coordinator of Inspire4Nature project, which she will present. Her research focuses on the ecological and anthropogenic processes shaping spatial biodiversity patterns, and implications to effective conservation strategies.

Abstract: Growing recognition that biological diversity is a global asset to present and future generations has underpinned a number of multilateral environmental policy agreements, including the EU Biodiversity Strategy. Implementing these agreements requires a global-scale cooperation among conservation scientists to collect, mobilise and synthesise biodiversity data and ecological knowledge, and translating them into recommendations for conservation action and indicators of progress towards meeting internationally agreed goals and targets. Inspire4Nature brought together a consortium of 5 leading international conservation organisations and 9 academic institutions to train 15 early stage researchers at this crucial interface between conservation science and policy. Our research programme will support effective international policy processes impacting the conservation of biodiversity at the national, European and global scales, by: enabling more effective site-based

conservation action and policy; guiding more effective species-based conservation action and policy; strengthening policy-relevant biodiversity indicators; and developing policy-relevant biodiversity scenarios under global change.



Catalina MUNTEANU
(Humboldt University of Berlin)

Leveraging the potential of historical spy satellite photography for ecology and conservation (EcoSpy) - MSCA Individual Fellowship (2017) project ID : [793554](#)

Dr. Catalina Munteanu works at Geography Department, Humboldt University of Berlin, Germany. She studies land use legacies in our contemporary environment and their implications for conservation and land management. Her work spans the disciplines of land use science, landscape ecology and conservation science.

***Abstract:** Conservation planning relies on remote sensing for providing information on ecosystems, habitats, and species' populations, but many world regions experienced widespread changes in habitats and populations prior to the modern remote sensing data collection (1980s). In EcoSpy, I pioneered the broad-scale use of historical, global, high-resolution spy satellite photographs from the Cold War era to extend the temporal scale of ecological and conservation remote sensing studies as far back as the 1960s. I integrated Corona with Landsat and Google Earth Images in several pilot studies to test the usability of Corona data for ecology and conservation. I assessed the changes in ecosystems of conservation concern, by identifying long-undisturbed forests in Romania, in a keystone species' population as well as on human pressures on ecosystems in Kazakhstan, and highlighted the benefits of Corona imagery for ecology and conservation worldwide. EcoSpy is deeply interdisciplinary and enhanced the long-term understanding of ecological processes such as land use legacies and time delayed effects while extending the temporal scale of modern remotely sensed data.*



Naia MORUETA-HOLME
(University of Copenhagen)

Land Use and Climate Change Attribution for biodiversity impact assessments (LUCCA) - MSCA Individual Fellowship (2016) project ID: [746334](#)

Dr. Naia Morueta-Holme is Assistant Professor tenure-track in Macroecology of the Anthropocene at the Center for Macroecology, Evolution and Climate, GLOBE Institute, University of Copenhagen. Her research focuses on the impacts of humans on biological communities, with a particular interest in attributing drivers of biodiversity change to the different aspects of global environmental change.

***Abstract:** Anthropogenic environmental change poses severe threats to biodiversity across the globe. Much research has focused on impacts of climate change on natural ecosystems, but we know little about combined effects with land use changes. This is at least partly due to 1) a lack of consistent definitions and measures of land use change that can be directly related to biodiversity responses, and 2) difficulties in attributing change to either driver because of correlations, scale-dependencies, and interaction effects between the two. Project LUCCA advances the field by addressing the challenges of land use definition and attribution of biodiversity responses to climate and land use changes. We review the past literature, explore the potential of high-resolution remote sensing products to measure land use changes, and use unprecedented long-term monitoring citizen science programs to*



Perrine LAROCHE & Claudia PARRA PAITAN
(Vrije Universiteit Amsterdam)



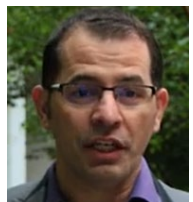
disentangle impacts of land use and climate change on bird populations as a case study. LUCCA is of high relevance for our understanding and prediction of biodiversity responses into the future, with direct applications in nature conservation and policymaking.

Operationalising telecouplings for solving sustainability challenges related to land use (COUPLED) - MSCA Innovative Training Network (2018) project ID: [765408](#)

Perrine Laroche is a PHD fellow at the Institute for Environmental Studies (IVM) of the Vrije Universiteit Amsterdam (VU). Her research focuses on assessing the distant environmental impacts of changing key aspects of Western lifestyles (e.g. diets, mobility, tourism).

Claudia Parra Paitan is a PhD candidate at the Institute for Environmental Studies (IVM) of the Vrije Universiteit Amsterdam (VU). She studies the sustainability impacts of forest-risk commodities at regional and global scales, especially cocoa.

Abstract: The COUPLED project generates scientific evidence on how the consumption of land-based resources (such as timber, palm oil, beef, coffee and minerals) in Europe or elsewhere can compromise the sustainability of distant places. COUPLED also aims to shed light on the drivers of this consumption and the potential consequences on regions that are directly or indirectly linked to the markets of those products. Our findings show that Western lifestyles increasingly rely on products grown in tropical areas, putting pressure on the natural ecosystems of these regions. The impacts of producing these products go well beyond the farm since they are in strong competition for land with other economic activities and pristine ecosystems. Several voluntary initiatives are in place, but no central coordination, cross-sectoral harmonization nor legally binding mechanism exist to effectively avoid negative consequences of European consumption overseas. The EU Green Deal needs to implement regulatory mechanisms to avoid compromising sustainability beyond European so that it effectively leaves no one behind.



David SIAUSSAT
(Sorbonne university),

Luciano PINOTTI
(University of Milan),

Timo GOESCHL
(Heidelberg University),

Isabelle KRATZ (4EU+ Alliance)

Biodiversity, sustainability in the agro-food system (4EU+) - Erasmus+ European University Alliance - [project website](#)

David Siauxsat, Associate professor, Sorbonne university, France; Professor Luciano Pinotti, PhD, Department of Health, Animal Science and Food Safety, University of Milan, Italy; Timo Goeschl, Dept. of Economics, Heidelberg University, Germany and Isabelle Kratz, Secretary General of the 4EU+ Alliance will be presenting the Erasmus+ European University Alliance project: 4EU+ , Biodiversity, sustainability in the agro-food system.

During today's panel debate, the project will be represented by Dr Julia Pawlowska, of the University of Warsaw, and Dr Luciano Pinotti, of the University of Milan.

Abstract: The project aims to set up a dynamic and multidisciplinary new curriculum that will offer specific micro-credentials to students in each university partner (Charles University, Sorbonne University (SU), University of Copenhagen (UCPH), University of Warsaw (UW) and university of Milan).. The topics addressed will be biodiversity and sustainability of the food systems and their





implication in the society. The biodiversity of crops, animals, pests, microbes etc. that contribute to food production, is a valuable component in the global push towards circular & sustainable — more efficient, resilient and less wasteful — agro-foodfarming systems. The proposed micro-credentials will combine small, individual learning units into broader, cohesive qualifications. The process will be focused on: 1- BSR-Biodiversity, Sustainability & Resource-saving; 2- ISM-Innovative solutions and mitigation strategies; 3-SDS Sustainable development and society. Microcredentials will consist of about 30h short preparatory units (learning boxes) followed by a 25h project (challenge phase). Students will choose their individual learning path going through the 3 domains listed above. These combinations of skills will well integrate and potentiate the local BA and MA degrees, offered as elective courses for their study program. The proposal wants to set up an educational path that can be consolidated and as a microcredential offered as part of the 4EU+ Alliance's catalog that will be established

Sustainable agriculture and soil health (1B)



Mónica HOLIK (REA)

Chair

Head of Unit MSCA Staff Exchanges, European Research Executive Agency (REA)



Kerstin ROSENOW (DG AGRI)

Moderator

Head of Unit, Directorate-General for Agriculture and Rural Development (DG AGRI)



Raphael Ocelli PINHEIRO
(University of Turin)

PhD Technology Driven Sciences: Technologies for Cultural Heritage (T4C) - MSCA COFUND (2016) project ID: [754511](#)

Raphael OCELLI PINHEIRO is a PhD researcher at University of Turin (Italy). His research topics are based on sustainable development, ecology, education, conservation and management of natural and cultural resources.

Abstract: *Agricultural systems may not be characterised only by its agricultural value, as it is inserted*

in several domains of social, cultural, geological and historical aspects. This research has been carried out to present the current situation of agricultural heritage programs and their development in Brazil, Italy, and the Globally Important Agricultural Heritage Systems (GIAHS) by the Food and Agriculture Organisation (FAO). To this end, the history and the extension of these programs and sites were recovered, the agricultural landscape diversity, the development of the regions, along with the entities and government bodies involved were identified.

Through the combination and quality of technical assessment and communities description, the agricultural heritage programs prove to be an endless source of useful information to the definition of policies aimed at rural areas, in addition to serving as a monitoring tool for many issues in regards to cultural landscape (e.g. geohazards, deforestation, etc.). Moreover, it shows the engagement of these countries in engaging national policies and entities on the promotion of agricultural heritage programs, as major steps for investing on the “greening” of agricultural policies at different levels.

Ultimately, these programs can certainly be improved, altered and adapted according to their function, context, demands, and public machinery, taking into consideration, that the agricultural systems surveyed do not just favor social and economic equity, but can also work as role models for technological innovations in the future of agriculture. Even further, being replicable in different regions of the world



Zexin QIAN (TU Delft/Wetsus)

Social, entrepreneurial and excelling doctors for water technology (WaterSEED) - MSCA COFUND (2014) project ID: [665874](#)

Dr. Zexin QIAN was a Wetsus/TU Delft PhD candidate, she recently just finished her PhD work and is waiting for the final defense. Zexin will present the MSCA-COFUND project called WaterSEED.

The project aims to develop selective membrane for selective ion separation. This covers the ion exchange membrane developed based on the concept of supported liquid membrane and the implementation of such a membrane under electrodialysis conditions.

Abstract: *Sodium accumulation is considered the main obstruction in greenhouse water recirculation systems due to crop intolerance for sodium. To reduce sodium levels and improve recycled water quality, greenhouse have started piloting reverse osmosis (RO) or electrodialysis (ED) desalination system in their recirculation loop. ED process when compare with RO having the advantage of higher water recovery rates, longer useful life of membranes and less membrane fouling. But as for the application of greenhouse water treatment, the commonly used ED system removes all ion constituents from the drainage water stream including the detrimental sodium but also various plant nutrients which are both monovalent (K^+ , NO_3^-) and multivalent (Ca^{2+} , Mg^{2+} , SO_4^{2-} , PO_4^{3-}) ions. Investigations have been done and reported regarding monovalent selective electrodialysis (MSED) for treating greenhouse wastewater. However, even MSED enabled the separation of Na^+ from the multivalent ions Ca^{2+} and Mg^{2+} , the system is still removing other monovalent cation, K^+ . Therefore, in order to achieve a full and efficient recovery of the salt fertilizers, it is necessary to recover K^+ and separate it from Na^+ . These two ions have the same charge (+1), very similar crystal and hydrated*

radii[15] and a very similar diffusion coefficient, which results the separation by charge, size and mobility not possible in the ED process. In the other hand, although K^+ and Na^+ have similar crystal and hydrated radii, the difference between the crystal and hydrated radii of each ion is significant enough to be reflected in terms of dehydration energy. Supported liquid membrane (SLM) which has an organic solvent phase immobilized in an inert polymer membrane support enabled the possibility for achieving a membrane selectivity based on the difference of the ion dehydration energy. This thesis aims to investigate the mechanism in selective cation separation of a membrane based on the concept of SLM under ED conditions and its potential implementation for achieving closed loop greenhouse irrigation.



Paul VAN DEN BRINK
(Wageningen University)

Effects of global change on the emission, fate, effects and risks of chemicals in aquatic ecosystems (ECORISK2050) - MSCA Innovative Training Network (2018) project ID: [813124](#)

Paul VAN DEN BRINK is a personal professor at Wageningen University and Research. He is involved in supervising and executing international projects on assessing the ecological effects of contaminants on aquatic ecosystems as well as those of multiple stressors, including climate change. Paul will present the MSCA-ITN project called ECORISK2050.

Abstract: The ECORISK2050 project brings together a world leading and interdisciplinary consortium of universities, research institutes, industry and regulatory and governmental authorities to deliver a cohort of Early Stage Researchers (ESRs). The coupled training goals and research objectives of the project are: 1) to assess how the inputs of chemicals from agriculture and urban environments and their fate and transport are affected by different environmental conditions, including those of specific EU regions, and how this will change under GC scenarios in order to assess the likely increase in chemical risks to human and ecosystem health. 2) to identify potential adaptation and mitigation strategies that can be implemented in the short and medium term, to abate unacceptable changes in risks, and use the GC scenarios to propose robust implementation pathways. 3) to develop a set of tools for use by industry and policy makers, that allow the impacts of a range of GC related drivers on chemicals risks to be assessed and managed.



Anastasia KTENIODAKI
(University College
Dublin)

A real-time forecast decision support system for the food supply chain (FreshProof) - MSCA Individual Fellowship (2015) project ID: [708374](#)

Dr. Anastasia KTENIODAKI is researcher at the University College Dublin leading research on an innovative systems approach to address food supply chain waste. She holds a PhD in Biosystems Engineering and an MSc in Food Engineering from UCD, and a BSc in Agriculture from Aristotle University of Thessaloniki, Greece. She has led research projects in academia and industry. Anastasia will present the MSCA-IF project called FreshProof.

Abstract: Freshproof is an innovative systems approach aiming to address the existing food supply chain losses/waste and the overall shortcomings in food safety, integrity, and traceability. Current commercial product waste reducing strategies have many limitations (constant postharvest

environmental conditions are assumed, and pre-harvest environment is completely disregarded and offer fragmented solutions lacking the capability to apply a holistic perspective to supply chain integrity.

Freshproof aims to address these issues and provide a system capable of predicting the remaining shelf-life of products as they progress through the supply chain. It will be based on First Expired First Out strategy (FEFO), incorporate pre- and postharvest conditions, and exploit novel data capture sensor units combined with advanced modelling algorithms.

The main objective of this project is to develop a cloud based forecast decision support system to deliver real-time food product shelf-life prediction along the farm-consumer supply chain. FreshProof will promote positive change across the European food industry by enabling stakeholders to proactively identify problematic loads and act to minimize losses.



**Maider GARCIA DE
CORTAZAR
AGUIRREZABAL**
(TECNALIA Research &
Innovation)

Scaling up the patented DIGIMET technology for the valorization of non-ferrous solid wastes - EIT Raw Materials (DIGISER++) - [project website](#)

Maider GARCIA DE CORTAZAR AGUIRREZABAL graduated in industrial Engineering from The School of Engineering of San Sebastian, University of Navarra and holds a Ph.D degree in Pyshico-chimie de la matière condensée from L'Université Bordeaux 1. Maider is Head of the Metals in Tecnalia Research and Innovation, with an investigation group specialized in the development of technologies and solutions for a climate-neutral and circular metallurgical industry. Maider will present the EIT Raw Materials project.

Abstract: The project aims at scaling up the patented DIGIMET technology for the valorization of non-ferrous solid wastes. The project technology starts at TRL5 and will reach TRL 7 through the development of the DIGISER++ demo able to valorize up to 15.000 ton/years in an operational environment. A consortium, representing the whole value chain, and a go to Market Strategy to ensure market introduction of the innovation within 2 years after the project. The project consortium includes the whole value chain for the development, validation and commercialization of the technology. TECNALIA and CEA are the technology providers to develop the technology from TRL5 to TRL7.

Clean energy (1C)



Renat BILYALOV (REA)

Chair

Deputy Head of Unit MSCA and citizens, COFUND, Global Postdoctoral Fellowships, European Research Executive Agency (REA)



Cristiana MARCHITELLI
(DG ENER)

Moderator
Policy Officer, Directorate-General for Energy (DG ENER)



Geraint ELLIS (Queen's
University Belfast)

Multi-sectoral approaches to Innovative Skills Training for Renewable energy And social acceptance (MISTRAL) - MSCA Innovative Training Network (2018) project ID: [813837](#)

Geraint Ellis is Professor of Environmental Planning at Queen's University, Belfast (QUB), Co-editor of the Journal of Environmental Policy and Planning and an independent member of the Irish National Economic and Social Council. He has research interests in planning and sustainability with a particular emphasis on renewable energy, planning governance and healthy urban planning.

Abstract: MISTRAL (Multi-sectoral approaches to Innovative Skills Training for Renewable energy & social acceptance) will train a new generation of researchers who can evaluate the complexity of social acceptance issues facing the deployment of renewable energy infrastructure, and propose innovative solutions in a variety of research, government and business contexts.

We will provide a world-class training environment where Early Stage Researchers will benefit from a range of diverse secondment experiences and develop advanced research techniques and transferable skills. The network has beneficiaries in the United Kingdom, Portugal, Denmark, Germany, Switzerland, and Ireland.



Alison WALKER
(University of Bath)

MAKING pErovskiteS TRuly expLOitable (MAESTRO) - MSCA Innovative Training Network (2017) project ID: [813837](#)

Alison Walker is Professor of Physics, researching multiscale modelling of perovskite and organic devices, e.g. solar cells. She is Coordinator of ETNs Maestro and Destiny and projects Extmos and Modecom. Also, she directs the UK Centre for Doctoral Training in Photovoltaics, chairs the Solar Commission on UK solar and held a Royal Society Industry Fellowship with Cambridge Display Technology.

Abstract: The European Training Network MAESTRO (MAKING pErovskiteS TRuly expLOitable) generates new skills, knowledge and innovation in the exploitation of perovskite materials in solar power and efficient lighting through establishing exploitation paths for perovskite devices. MAESTRO is an intersectoral and multidisciplinary network of 10 academic and 3 industrial participants and 2 industrial partners from 8 EU and Associated countries, including 2 countries in the EU-13. It undertakes research and development on conversion of sunlight to electricity and electricity back to light in devices using perovskite semiconductors, a material shown in the last 12 years to have a major impact on solar power and in display technology. MAESTRO offers broad skills development and experience of cross sectoral research to 15 Early Stage Researchers, ESRs. The research undertaken by



**Emanuela
MASTRONARDO**
(University of Messina)

MAESTRO shows the ESRs how to deal with complexities and uncertainties. Training is provided in science and technology across physics, chemistry, materials science, electrical engineering, exploitation from laboratory to fabrication; transferable skills and skills needed for innovation.

Solar Energy Storage PERovskites (SESPER) - MSCA Individual Fellowship (2016) project ID: [746167](#)

Emanuela Mastronardo is Senior Researcher at Engineering Department of the University of Messina, Italy, where she earned her Ph.D. in Material Science and Engineering in 2016. In 2017 she received the Marie Skłodowska-Curie Individual Global Fellowship, funded by the European Union's Horizon 2020 research and innovation programme, for developing the project SESPer-Solar Energy Storage Perovskites.

***Abstract:** Thermochemical Storage (TCS) systems can directly store solar energy produced by a Concentrating Solar Power (CSP) plant during on-sun operation mode as heat and reuse it on demand during off-sun operation mode. The SESPer project aims at the identification of promising candidate storage materials, among perovskite oxides (ABO₃), for TCS system to bring the development of this technology to a level closer to the commercial scale and to favor the transference of these systems to the CSP plants installation. The working principle of a TCS system based on a perovskite consists in the following reaction: $ABO_3 (s) \leftrightarrow ABO_{3-\delta} (s) + \delta/2 O_2 (g)$. The reduction, being endothermic, is the heat storage step, while oxidation releases heat when it is required. The amount of reversibly exchangeable oxygen, δ , is a function of temperature and oxygen partial pressure. The overall objective of this project is to study perovskites with more earth abundant elements (i.e. Ca, Fe, Mn-based) for identifying the most promising candidate storage medium on which it is carried out a comprehensive thermodynamic study that enables the evaluation of the heat storage capacity.*



George LAVIDAS (Delft
University of Technology)

WAVe Resource for Electrical Production (WAVREP) - MSCA Individual Fellowship (2017) project ID: [78734](#)

Dr. George Lavidas is an Assistant Professor of Marine & Hydro based energies at Delft University of Technology. In 2018 he was awarded a Marie Skłodowska-Curie Individual Fellowship, he is a Work Group Leader at a COST Action (CA17105), Vice Chair of International Integrated Wave Energy Research Group (IIWER), a member at the Energy Policy Group of the Marie Curie Alumni Association, Contributor & reviewer of ocean energies in the Global Status Report 2018-2020, and scientific advisor to several NGO's and EU institutions.

***Abstract:** WAVREP challenged the notion that wave energy should be considered only at energetic ocean regions. More than 70% of EU coastlines have moderate wave energy resource of 3000-6000 W/m resulting in lower harsh conditions when compared to open ocean coasts. Most Wave Energy Converters (WECs) are developed for higher operational ranges, with capacity factors and availability at such areas not exceeding 15% and 40% respectively. Higher latitude regions encompass larger wave environments that can propagate high energy content from 5000-8000 W/m. However, such conditions impose significant stresses on the structural integrity and negatively affect expected energy*

production of WECs, with final capacity factors not exceeding 15-25% (device dependent). WECs at highly energetic wave environment also require higher survivability considerations and have reduced maintenance times. Such factors result at higher capital, operational and energy costs, hindering WECs cost-effectiveness. Using an interdisciplinary scientific methodology the project aims to provide a WEC can attain higher availability and capacity factors over 60% and 30% respectively, enhancing its global applicability.



Alfredo Ortiz Fernández
(University of Cantabria)

Raising knowledge and developing technology for the design and deployment of high-performance power transformers immersed in biodegradable fluids (BIOTRAFO) - MSCA Research and Innovation Staff Exchange (2018) project ID: [823969](#)

Alfredo Ortiz Fernández is Full Professor in the field of Electrical Engineering at the University of Cantabria, where he has taught at the Higher Technical School of Industrial Engineers since 1999. In this faculty he has carried out university management tasks as responsible for the Erasmus program, academic responsible and deputy director of the Engineering in Electricity, Mechanics, Electronics and Automation. He is currently the Deputy Director of the Master in Industrial Engineering at the University of Cantabria. His research focuses on the analysis of the quality of electrical energy, electromagnetic and thermal studies of electrical machines, optimization of energy systems in buildings and energy characterization of forest biomass.

Abstract: The project has created an international and inter-sectorial network which to expands current knowledge about the application of ester-based fluids in power transformers. BIOTRAFO includes activities related to the production and characterization of these fluids considering several analysis: physical-chemical, thermal, dielectric and magnetic. The properties of the new fluids and the evolution of these properties with aging are studied. Furthermore, the interaction of the fluids with the insulating paper is tested, analyzing the influence of ester-based fluids on its aging process and the overall performance of the paper-oil system. Finally, global transformer models are being developed to determine the influence of the use of ester-based fluids in the transformer design.

3.30 – 3.45PM **Break**

3.45 – 4.45PM PARALLEL THEMATIC PANELS (PART 2)

Eliminating pollution (2A)



Frank MARX (REA)

Chair

Deputy Head of Unit MSCA Doctoral Networks, European Research Executive Agency (REA)



**Joachim D'EUGENIO
(DG ENV)**

Moderator

Senior Expert, Directorate-General for the Environment (DG ENV)

Joachim D'EUGENIO is a Senior Expert at the Directorate-General for the Environment (DG ENV). Joachim D'EUGENIO has over 20 years of experience and currently focuses on industrial emissions and clean water and air.



**Ka Leung LAM (Duke
Kunshan University)**

Integration of water, energy and material flows to achieve sustainable urban solution (LEaDING Fellows) - MSCA COFUND (2015) project ID: [707404](#)

Dr. Lam is an assistant professor of environmental science at Duke Kunshan University. His research focuses on sustainable water management – GHG emissions management, resource recovery, and water security. Prior to joining DKU, he conducted water-related sustainability research at Delft University of Technology and the University of Queensland. This presentation is about his project at TU Delft.

Abstract: *Our approaches to water management are undergoing transitions with increasing emphases on for example, reducing greenhouse gas (GHG) emissions, enabling resource recovery and improving water security. Many water-related opportunities (integrating with energy and material flows to cities) are available or emerging to contribute to these transitions. To achieve sustainable transitions of water management, we need to improve our assessments on these water-related opportunities. This can provide quality information to decision makers at different system levels, and empower them to make more optimised and informed decisions. This project attempted to approach the question: how do we assess different water-related opportunities to identify and deploy the more “sustainable” solutions? Specifically, this project focused on water-related opportunities for GHG emissions reduction, nutrient recovery, and thermal energy recovery. It used life cycle assessment and least cost analysis approaches.*



Leonardo PICCINETTI
(Europe for Business)

Removal and Recovery of Pharmaceutical Persistent Pollutants from Wastewater (RECOPHARMA) - MSCA Research and Innovation Staff Exchange (2017) project ID: [778266](#)

A European research and business consultant, Leonardo Piccinetti is also a member of the International Society for the Circular Economy, EU Climate Pact Ambassador for Emerging Contaminants, and a specialist in Technology Transfer, Economics, Smart Specialisation, International Cooperation and Innovation. He holds an MSC in Economics and Innovation, and an MSc in Digital Marketing.

Abstract: The RECOPHARMA Project emerged from a need to develop an effective treatment to recover Recalcitrant Cytostatic Drugs (CDs) through the sequential integration of the potential offered by technologies such as Molecularly Imprinted Polymers (MIPs), Reagentless Thermosorption (RTS), Nanocomposites Functional Materials (NFMs) and Advanced Oxidation Processes (AOP). The greatest part of the research programme is focussed on the design, development and implementation of a pilot plant demonstrator for CD treatment. The RECOPHARMA Project brings together 8 partners in a Research and Innovation Staff Exchange action, fostering intersectorial mobility between Europe and Cuba. Initiated on 01/01/2018, during the 48 months of the project, 107 exchanges will be carried out to boost staff competences by acquiring new scientific and complementary skills through transnational mobility.



Yaneth CARDONA
(University of Navarra)

Antibiotics and drugs in surface waters (IberusTalent) - MSCA COFUND (2016) project ID: [743880](#)

Yaneth CARDONA is a Ph.D. student at the University of Navarra. She is studying two environmental issues: the pollution by organic chemicals in the aquatic environment and the accumulation of hazardous waste in the aluminium recycling processes. How the two can be linked will be explained in her presentation.

Abstract: Among the current environmental problems are the pollution by organic chemicals in the aquatic environment and the accumulation of hazardous waste, as the saline slag produced in the aluminum recycling processes. We propose a new alternative for managing this aluminum-containing saline slag waste, using it in the synthesis of Alumina Pillared Clays (Al-PILC). Aluminum was extracted using both alkaline and acid solutions and used in the synthesis of an intercalant agent of a montmorillonite. The solids obtained from these processes (Al-PILCBE and Al-PILCAE) were characterized by several techniques, and also evaluated as adsorbents for three organic pollutants: bisphenol A, 2,6-dichlorophenol, and triclosan. Their adsorption capacities were compared with those for montmorillonite (Mt) and a PILC obtained using conventional method (Al-PILCCM) with an aluminum salt as the aluminum source. Due to the results obtained at this point which shows that both PILC synthesized have excellent potential as adsorbents for 2,6DCP and TCS, removing 98.46% and 98.47% of these compounds, respectively, we will evaluate them as supports for photodegradation of the aforementioned pollutants.



**María VENTURA
SANCHEZ-HORNERO**
(University Rey Juan
Carlos)

Integrating waste treatment by attracting Talented Researchers within the Spanish Campus of International Excellence 'Smart Energy' and the region of (GOT ENERGY) - MSCA COFUND (2016) project ID: [754382](#)

Dr. Maria Ventura SANCHEZ-HORNERO is an expert in the field of catalysis and biomass valorisation. She currently holds the position of Marie-Curie Fellow at University Rey Juan Carlos, she has an international career working in recognized research centres, such as in Hokkaido University, Japan. She has published 23 original research articles and she holds two patents.

Abstract: Currently, the biowastes generated in the European Union, as the organic fraction of municipal solid waste and lignocellulosic wastes, are managed by using high energy demand and destructive techniques as incineration or ineffective chemical treatment. Usually, these kinds of wastes are stockpiled; giving them no value, but waste has value! being necessary its valorization by environmentally friendly and economical methods. In this context, the development of new and groundbreaking technologies that can use these wastes as feedstock, transforming them into a high added-value product, is a mandatory objective that will give back economic, social, and environmental benefits. The synergy between different branches of science is a key factor in technology implementation and development success. The IWaTeVaC project is based on the symbiosis of two technologies, biological and chemical, with pioneers systems for the valorization of biowastes based on the friendship of photobiorefineries and sustainable catalysis. Purple phototrophic bacteria, high versatile microorganisms for the transformation of biowastes into bioproducts, and heterogeneous catalysts synthesized by cheap metals and green processes are combined to achieve bioplastics and other high added value products, replacing those coming from fuel resources.



Rositsa VELICHKOVA
(Technical University of
Sofia)

Recycling of carbon fertilizer from straw for sustainable agriculture - EUt+ - Erasmus+ European University Alliance - [project website](#)

Dr Rositsa Velichkova has a PhD in Fluid Mechanics. She is an associate professor since 2013 at the Technical University of Sofia. Her field of research has mainly addressed outdoor environment assessment, sustainable agriculture, CO2 utilization and risk assessment, and resource–energy–water (REW).

Abstract: The issue of growing food in a changing climate is one of the topical and significant issues for humanity. All people eat. Increased agricultural yields from healthy soils reduce the pressure to use carbon-enriched agrochemicals. Higher yields also reduce the pressure to expand farmland, preventing carbon emissions from deforestation and other forms of land use. This factor is particularly important in areas where soil carbon levels are usually very low and it has been proven that biocoke doubles and even triples yields. The aim of the project is to develop and implement a new biotechnology strategy to improve crop productivity and sustainability through the production of carbon fertilizer from straw.

Climate action (2B)



Mónica HOLIK (REA)

Chair

Head of Unit MSCA Staff Exchanges, European Research Executive Agency (REA)



Katarzyna BALUCKA-DEBSKA (DG CLIMA)

Moderator

Policy Officer, Directorate-General for Climate Action (DG CLIMA)



Eduardo VELAZQUEZ
(University of Valladolid)

Carbon accumulation over succession to enhance mitigation of CO2 emissions (CASE-CO2) - MSCA Individual Fellowship (2018) project ID: [799885](#)

Eduardo Velazquez is a plant ecologist whose career has been focused on the study of ecological succession in landslides, the main drivers of change in species diversity across environmental gradients, and community assembly in tropical, temperate and Mediterranean environments. Currently, he is assessing the role played by spontaneous revegetation of abandoned agricultural lands in atmospheric CO2 sequestration.

Abstract: Forest expansion in abandoned agricultural lands has been pervasive in many areas of the Northern Hemisphere, over the last decades. However, the role played by this process in atmospheric CO2 sequestration is poorly understood for Mediterranean continental environments. In this project, we estimated the amount of C accumulated through forest expansion in abandoned agricultural lands, and assessed the main driving factors of this process in a vast region of Central-North Spain, between 1957 and 2017. We achieved this objective combining plot-level above- and below-ground C estimations (AGC and BGC) and radar backscatter. We found that a large proportion (1.54 %) of the study region corresponded to forests developed after agricultural land abandonment. Mean AGC and BGC densities (18.04 and 6.78 Mg C · ha⁻¹), were also large, but total AGC and BGC stocks found (6.27 and 3.73 Tg) were modest. We also identified Mean annual rainfall as the major determinant of C accumulation. These results suggested that atmospheric CO2 sequestration by this process has barely contributed to sequester 1 % of the total CO2 emissions of the study region, but it might be increased in the near future.



Pille MAND (University of Helsinki)

An understated player of climate change - increased air humidity - impact on volatile signaling compound emission at northern forests (BioVOLHum) - MSCA Individual Fellowship (2019) project ID: [798293](#)

Pille Mänd got a PhD in 2013 from the University of Tartu. 2003-2018 studied the acclimation of plants to changes in environmental conditions in University of Tartu, Estonia. 2019-2020 post-doctoral researcher at University of Helsinki, Finland, EU grant: "An understated player of Climate Change - increased air humidity - impact on volatile signalling compound emission at northern forests".

*Abstract: Higher humidity, which is predicted for northern latitudes, can cause changes in forest functioning. The effect of higher air humidity on reactive volatile compound (VOC) emissions is unknown. In present project the effect of environmental humidity and consequent changes in tree physiology on VOC and nitric oxide (NOx) emissions from tree canopies was studied. The study was conducted at Silver birch (*Betula pendula*) stand in an atmospheric humidity manipulation experiment FAHM, in Estonia.*

We found that monoterpene emissions were highest during drought period. Sesquiterpene emissions were lower in plots with increased air humidity. Nitric oxide emissions were highest during periods of higher evaporation rates from trees and were significantly affected by leaf water potential as well. The abundance of non-structural carbohydrates within leaves (estimated as leaf osmotic potential) had opposite effect on emissions of monoterpenes versus sesquiterpenes. Monoterpene emissions suggested that more VOC were emitted, when non-structural carbohydrates are in excess. On the contrary, more sesquiterpenes were emitted, when leaf osmotic potential was low.

In conclusion, we found that the ratio of different reactive compounds (affecting atmospheric chemistry), that are emitted by birches, might change significantly due to more humid climate. The extent of how much humid climate affects VOC emissions depends on the rate carbohydrate accumulation within trees.



Sergio GONELL
(Universitat Jaume I de Castelló)

Fe complexes for Reduction/Oxidation Catalysis (Fe-RedOx-Cat) - MSCA Individual Fellowship (2017) project ID: [794119](#)

Dr. Sergio Gonell is a Juan de la Cierva Incorporación researcher at the Institute of Advanced Materials, Universitat Jaume I of Castelló (Spain). He has a broad and multidisciplinary expertise, which includes a strong background in the fields of inorganic synthetic chemistry, homogeneous catalysis, electrocatalysis and supramolecular chemistry. His h-index is 12.

Abstract: The electrochemical reduction of CO₂ is a challenging reaction of interest from a fundamental perspective and as a candidate for converting an environmentally harmful gas into a valuable fuel. Application in large scale of this reaction will likely require the use of catalysts based on affordable and abundant metals. Organometallic ruthenium complexes bearing a 2,2':6',2''-terpyridine paired with a bidentate ligand containing mixed pyridine-N-heterocyclic carbene are well established electrocatalysts for CO₂ reduction to CO. We recently unraveled the mechanism for this

system. Now in this contribution, we will discuss the synthesis of the iron analogues, as well as the mechanism of this new family of electrocatalysts in CO₂ reduction. A combination of NMR spectroscopy, cyclic voltammetry, and spectroelectrochemical infrared spectroscopy have established similarities and differences between the catalytic cycle performed by iron and ruthenium complexes.



Shruti SETTY
(Wageningen University)

Detecting tipping points in the Earth system from climate reconstructions (Netherlands Earth System Science Centre / NESSC) - MSCA COFUND (2019) - project ID: [847504](#)

MISSING BIO AND ABSTRACT



Rachel WHITE (University of British Columbia)

Propagation of atmospheric rossby waves - connection to predictability of climate extremes (PROTECT) - MSCA Individual Fellowship (2018) project ID: [797961](#)

Dr Rachel White is an Assistant Professor in Climate Dynamics. Her research interests include fundamental questions of atmospheric dynamics, the connections between large-scale atmospheric dynamics and extreme weather, and how climate change will impact extremes. Originally from the UK, Rachel held post-doctoral positions in Seattle, US, and Barcelona, Spain, before moving to the UBC in Vancouver.

Abstract: Extreme weather events such as heatwaves have a devastating impact on society. Skilful predictions of such events with sufficient lead-time can provide huge benefits; however, this project has shown that sub-seasonal to seasonal (S2S) prediction skill of summer heatwave propensity is relatively low. The goal of the project was to understand the impact of large-scale atmospheric circulation on S2S predictability of mid-latitude extreme temperature events. Many extreme temperature events are associated with planetary-scale atmospheric Rossby waves that become unusually stationary, remaining in one place for several days to weeks. Atmospheric waveguides, created by strong and narrow atmospheric jets, influence the propagation pathways of Rossby waves. This project developed an algorithm to objectively detect mid-latitude atmospheric waveguides in gridded atmospheric data. This was applied to observation-based data, S2S forecasts, and climate models. The PROTECT project has furthered our collective knowledge of the connections between summer heatwaves and large-scale atmospheric dynamics. Future work will investigate potential improvements to the S2S prediction skill of heatwaves.

Green Transport (2C)

Sandro RICCI (REA)

Chair and moderator

Deputy Head of Unit MSCA Staff Exchanges, European Research Executive Agency (REA)



Davy PISOORT (KU Leuven Bruges Campus)

Safer Autonomous System (SAS) - MSCA Innovative Training Network (2018) project ID: [812788](#)

Dr. Davy Pissoort received the PhD degree in electrical engineering from Ghent University, Belgium in 2005. After that he work as an R&D Engineer at Agilent Technologies in Ghent, Belgium. Since 2009, he is a professor at KU Leuven Bruges Campus. His research interests include EMI Risk Management, characterization of shielding effectiveness and safety assurance of interconnected autonomous systems. Davy is presenting the ITN project called Safer Autonomous System (SAS).

Abstract: Autonomous systems offer humankind tremendous opportunities, like freeing us from mundane tasks, carrying out risky procedures and generally giving us more time to enjoy the things we like doing. However, we lack trust in many forms of autonomous systems: partly this is human nature, but primarily because these systems, such as self-driving cars, have not demonstrated their safety credentials. Only by making these systems safer can we expect their widespread acceptance. The Safer Autonomous Systems (SAS) ETN is about getting people to trust these systems by making the systems safer. SAS will bring together 15 early-stage researchers (ESRs) to investigate new forms of system-safety engineering, dependability engineering, fault-tolerant and failsafe hardware/software design, model-based safety analysis, safety-assurance case development, cybersecurity, as well as legal and ethical aspects. SAS is closely aligned with the high-priority areas of the EU, addressing many Horizon 2020 thematic, e.g., Industrial Leadership (Advanced manufacturing and processing), Societal Challenges (Smart, green and integrated transport; Secure, clean and efficient energy) and Excellent Science.



Elke DECKERS (KU Leuven)

Next generation Pass-By Noise approaches for new powertrain vehicles (PBNv2) - MSCA Innovative Training Network (2017) project ID: [721615](#)

Dr. Elke Deckers (KU Leuven Ph Mech. Eng. 2012) Elke Deckers is Assistant Professor within the Leuven Mecha(tro)nic System Dynamics Division and overviews and steers research related to numerical and experimental vibro-acoustics. She is involved in multiple national and international projects related to material characterization, dynamics of lightweight systems and vibro-acoustics, amongst which the H2020 ETN PBNv2, which she coordinated. Elke is presenting the ITN project called Next generation Pass-By Noise approaches for new powertrain vehicles (PBNv2).

Abstract: With transportation noise being the second most deadly environmental pollutant in Europe, engineering for future mobility must be inspired by ecology, economy and health to enable green and silent vehicles. Legislations define maximum noise emission limits that have to be complied with during standardized pass-by noise test procedures. Given novel, often electrified, vehicle powertrain concepts, new pass-by noise evaluation approaches are required. The PBNv2 project (Next generation Pass-By Noise approaches for new powertrain vehicles) brings together early stage researchers and experienced specialists from key players in academia and industry across Europe covering different scientific disciplines and industrial stakeholders from a broad range of backgrounds to optimally tackle the challenges ahead. PBNv2 is formed by 10 beneficiaries combining leading education institutes, top research institutions and leading companies as well as 5 partner organisations established in European automotive R&D, to assist in the dissemination and public engagement of PBNv2 results, and in providing dedicated training to enhance the entrepreneurial mind set of the ESRs.



Valentin IVANOV
(Technische Universität
Ilmenau)

Benchmarking of wheel corner concepts towards optimal comfort by automated driving (OWHEEL) - MSCA Research and Innovation Staff Exchange (2020) project ID: [872907](#)

Dr. Valentin Ivanov is working at TU Ilmenau (Germany) as the Head of the Automotive Engineering Group and coordinator of several European projects and Marie Skłodowska-Curie Actions. He is SAE Fellow, IEEE Senior Member, member of Society of Automotive Engineers of Japan and the Association of German Engineers. He was awarded with Alexander von Humboldt- and Marie-Curie-Fellowships. His research fields are electric vehicles and automotive control systems. Valentin is presenting the RISE project called Benchmarking of wheel corner concepts towards optimal comfort by automated driving (OWHEEL).

Abstract: The project OWHEEL aims at the development and evaluation of new concepts of automotive wheel corners as crucial elements of future electric vehicle architecture tailored to provide an optimal comfort during automated driving. For these concepts, the project will include relevant stages of development design, extensive simulation studies and experimental validation. The research and innovation objectives are focused on:

- Revisiting the driving comfort criteria with their tuning to automated driving requirements and operational modes of electric vehicles;
- Development of benchmarking criteria and analytical tool for comparison of wheel corner concepts by driving comfort quality with simultaneous ensuring of required performance in terms of safety, energy-efficiency and reliability;
- Development and validation of active and passive wheel corner concepts;
- Producing practical recommendations for automotive system developers based on obtained R&D results

The implementation of the project OWHEEL will be based on intensive staff exchange that leads to collaborative research and training between universities and industrial organizations from EU, Japan and South Africa.



Aleš STEFANCIC (Paul Scherrer Institute)

Surface modification of battery materials: pushing the boundaries of Li-ion Batteries (PSI-FELLOW-II-3i) - MSCA COFUND (2016) project ID: 701647

Dr. Aleš STEFANCIC obtained his PhD in Chemistry at Durham University working on alkali-metal-reduced polycyclic aromatic hydrocarbons, and later, he was a post-doctoral researcher as part of the EPSRC “Skyrmionics” grant at University of Warwick, UK. In 2019, he has joined Battery Materials & Diagnostics group at PSI, where he investigates the surface modification of high-voltage cathode materials. Aleš is presenting the COFUND project called Surface modification of battery materials: pushing the boundaries of Li-ion Batteries (PSI-FELLOW-II-3i).

Abstract: Layered transition metal oxides (LTMO) promoted a rapid advance of Li-ions batteries in the last decades. In order to fully access their theoretical capacities, a higher cut-off potential need to be applied, however, this hampers the battery performance, with a rapid capacity and voltage fading. The fading is mainly caused by the oxygen instability at the particles surface leading to the migration of the transition metals into the Li layers, resulting in a gradual structural degradation from layered to rock salt. Here we present the surface fluorination of high-voltage cathode material, Ni-rich LTMO (LiNi_{0.8}Co_{0.15}Al_{0.05}O₂), using a mild fluorinating agent in a flow-type reactor. The electrochemical performance of the obtained materials was systematically investigated with long-term galvanostatic and cycling voltammetry tests. A long-term cycling revealed that the fluorinated material retains 94% of its initial capacity after 100 cycles, while pristine material retains only 81% at cut-off potential of 4.5 V vs. Li+/Li. Hence, our results show that fluorination of Ni-rich LTMO provides an effective route to improve the cycling stability of Li-ion batteries at high operation voltage.



Pamela NOLZ (St. Pölten University of Applied Sciences)

Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions (E³UDRES²) - Erasmus+ European University Alliance: <https://eudres.eu/>

Dr. Pamela NOLZ is a member of E³UDRES² at St. Pölten University of Applied Sciences. After receiving her Ph.D. from the University of Vienna, she worked at École des Mines de Saint-Étienne and at Vienna University of Economics and Business. Before joining STPUAS, she was scientist at Austrian Institute of Technology. Her research interests are focused on Operations Research in sustainable logistics. She will present the Erasmus+ project Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions (E³UDRES²).

Abstract: E³UDRES², the Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions, promotes the development of small and medium-sized cities and their rural environments into smart and sustainable regions and shapes a prosperous future with the best possible quality of life for self-determined people in a progressive European society. E³UDRES² co-creates outstanding ideas and concepts for future universities, integrates challenge-based education, mission-oriented research, human-centred innovation as well as open and engaged knowledge exchange as interrelated core areas and establishes an exemplary multi-university campus across Europe. E³UDRES² aims to train, motivate and involve smart and ambitious people – learners,

educators, researchers, entrepreneurs, non-academic staff and various other collaborators – to act as change agents transforming their neighbourhoods into smart and sustainable regions and contributing solutions to global challenges, e.g. circular economy, well-being and the human contribution to artificial intelligence.

Wednesday 7 July (DAY 2)

9 – 10 AM

PARALLEL THEMATIC PANELS (PART 3)

Biodiversity (3A)



Jean-Bernard VEYRET
(REA)

Chair

Head of Unit MSCA European Postdoctoral Fellowships, European Research Executive Agency (REA)



Anne TELLER (DG ENV)

Moderator

Senior Expert, Directorate-General for the Environment (DG ENV)

Anne TELLER is a Senior Expert, Natural Capital- Biodiversity, Directorate-General for the Environment (DG ENV). Within this role her main task is to improve the knowledge and evidence base for EU biodiversity policy. She contributed to the delivery of the first EU wide ecosystem assessment in October 2020 together with the Joint Research Centre and the European Environment Agency.



Fidel ECHEVARRIA (The European University of the Seas)

Sustainable development for oceans (SEA-EU) - Erasmus+ European University Alliance: <https://sea-eu.org/>

Dr. Fidel ECHEVARRIA is Professor of Ecology, University of Cadiz (Andalucia, Spain). His research focuses on the study of plankton in aquatic ecosystems.

***Abstract:** One of these first generation of European Universities is the European University of the Seas (SEA-EU), an alliance between the University of Cadiz, the University of Bretagne Occidentale in Brest (France), the University of Kiel (Germany), the University of Gdańsk (Poland), the University of Split (Croatia) and the University of Malta, which will generate a new model of an inclusive, multilingual and sustainable University. The European University of the Seas (SEA-EU) integrates universities located in cities with a long historical, cultural and economic tradition around the sea, and covers all*



Lee BROWN (University of Leeds)

European marine basins within its geographical scope. SEA-EU, in the words of our Mission Statement, intends to "reconsider and rethink knowledge from the periphery, through an inclusive proposal that provides a new vision on equality and development in higher education for Europe".

A European training and research network for environmental flow management in river basins (EUROFLOW) - MSCA Innovative Training Network (2017) project ID: [765553](#)

Prof. Lee Brown works at the School of Geography & Water, University of Leeds. He leads research on freshwater ecosystems to increase understanding of how biodiversity and functional processes respond to environmental change.

***Abstract:** River flow regulation is one of the biggest stressors affecting river ecosystems worldwide, and major legislative efforts are therefore underpinning the development of new approaches to mitigate these impacts. These approaches are based on optimising the management of flows to maintain services to humans (e.g. water supply, hydropower) whilst protecting and/or rejuvenating the environment with water of adequate quantity/quality in space and time (i.e. environmental flows, aka e-flows). Euro-FLOW is training 15 researchers to be future leaders in the science, business and policy of this field. The project develops novel scientific understanding via four inter-related work-packages: (i) abiotic environment, (ii) biodiversity, (iii) ecosystem processes and (iv) models to underpin socio-economic and policy decision-making. Collaboration between work packages combines diverse expertise in field surveys, experimental manipulations and numerical modelling, to create synergistic scientific outcomes and cross-sector mobility. The project spans mountain, upland and lowland locations across Europe, and infrastructure used for water supply, hydropower and agricultural abstractions.*



Frederic CHERQUI
(University Lyon 1)

Innovative stormwater asset management in future cities (Mind4Stormwater) - MSCA Individual Fellowship (2017) project ID: [786566](#)

Frederic CHERQUI works at the The University Lyon 1 & INSA, France. He has 15+ years research experience in urban water management, performance assessment and decision aid. He is vice-chair of a working group dedicated to Urban Drainage Asset Management, and the co-leader of the Nature-based Solution working group of the Water Europe Association.

***Abstract:** Mind4Stormwater aims to help cities achieve sustainable management of their Stormwater Control Measures" (SCMs). SCMs refer to nature-based solutions dedicated to managing stormwater, with the aim of mitigating the negative impacts of traditional stormwater pipe networks. Such solutions are often applied at or near to the source of runoff: swales, infiltration trenches, or green roofs. SCMs remain a poorly understood but relatively important asset in cities. Operational and research questions have so far largely focused on optimising hydrologic, hydraulic and water quality performance. However, there is a growing concern regarding sustainable long-term management of these systems, and their impacts on performance and cost. Such concern will likely limit future application and development of SCMs. On the other hand, SCM operation and maintenance could*



Julie NATI (Centre National de la Recherche Scientifique)

create new business opportunities related to sensors, monitoring and asset management. Mind4Stormwater is working on adapting existing low-cost technology sensors to the specific context of SCMs and developing an innovative Expert System to guide the utility manager in selecting the best O&M actions for each SCM.

Individual variation in tolerance of hypoxia and high temperatures in teleost fish: mechanisms and implications (INDITOL) - MSCA Individual Fellowship (2018) project ID: [839039](#)

Julie Nati is a Research fellow at the University de Montpellier, France. Julie's main research interests are the effects of environmental factors (e.g. temperature, hypoxia) on physiology and behaviour in fish.

***Abstract:** Episodes of hypoxia and acute warming can be major environmental stressors for coastal marine fishes, that will increase in frequency and severity with global change. Hypoxia and warming share a common physiological mode of action in fishes, both challenge the animal's capacity to provide sufficient O₂ to respiring tissues. Within fish populations, individuals may vary in tolerance of these stressors; the existence of such variation can define the ability of populations to persist in a more stressful world. Moreover, when individuals vary in tolerance, underlying physiological mechanisms for variation can be explored. Understanding of mechanisms is very valuable because the persistence of variation in tolerance, within populations, may indicate that there are functional trade-offs, whereby being tolerant is not systematically advantageous but has costs. Using controlled experiments on European sea bass *Dicentrarchus labrax*, an emblematic coastal species, our aims are to: 1) document variation in sub-lethal tolerance of hypoxia and acute warming in a population of juveniles, and reveal cross-tolerance; 2) demonstrate that relative tolerance depends upon each individual's intrinsic respiratory physiology; 3) investigate how tolerance relates to underlying mitochondrial efficiency, and 4) evaluate whether tolerance trades-off against important individual traits, as growth rate. The experiments comprise innovative state-of-the-art techniques of sea bass husbandry; in-vivo respirometry and exercise performance; sub-lethal tolerance endpoints based upon cardiorespiratory performance, and assays of mitochondrial function in fresh tissues. We performed static respirometry on more than 1000 individual European sea bass. We measured their standard metabolic rate which correspond to their baseline metabolism involving all life sustaining processes. A sub-lethal hypoxia endpoint was measured by closed respirometry on these same individuals. This gave us a hypoxia tolerance trait. On a subsample of 95 individuals, we performed mitochondrial assays on two fresh collected tissue types, liver and heart. We measured mitochondrial respiration in these tissues. In other 95 individuals, we performed swimming trials in two swim tunnels. Fish were swimming at a constant speed while warmed up at a constant heating rate of 1°C every 30 minutes until the point of exhaustion. The temperature at fatigue was recorded and determined as a sub-lethal thermal tolerance trait. A side on another project, growth efficiency was analysed for a subset of the 1000 individuals. Consequently, we have growth rate data on those fish. Data will be analysed to reveal trait correlations and dependencies, and existence of functional trade-offs. These multiple level*



Gert Wörheide (Ludwig-Maximilians-Universität München)

studies, to reveal functional trade-offs of tolerance to hypoxia and warming, will provide novel and important insights into the nature of fish populations in a more stressful world.

Comparative genomics of non-model invertebrates (IGNITE) - MSCA Innovative Training Network (2017) project ID: 764840

Prof. Dr. Gert WÖRHEIDE works at the Department of Earth and Environmental Sciences & GeoBio-Center, Ludwig-Maximilians-Universität München. His research focusses on (phylo)genomics, molecular systematics, and biomineralization of non-bilaterian coral reef animals.

***Abstract:** Invertebrates, i.e., animals without a backbone, represent 95% of animal diversity on earth but are a surprisingly underexplored reservoir of genetic resources. The content and architecture of their genomes remain poorly known or understood, but such knowledge is needed to fully appreciate their evolutionary, ecological and socio-economic importance, as well as to leverage the benefits they can provide to human well-being, for example as a source for novel drugs and biomimetic materials. Europe is home to significant world-leading expertise in invertebrate genomics but research and training efforts have been uncoordinated. IGNITE bundles this European excellence to train a new generation of scientists skilled in all aspects of invertebrate genomics. We considerably enhance animal genome knowledge by generating and analysing novel data from undersampled invertebrate lineages and developing innovative new tools for high-quality genome assembly and analysis. Well-trained genomicists are in increasing demand in universities, research institutions, as well as in software, biomedical, and pharmaceutical companies. Through their excellent interdisciplinary and intersectoral training spanning from biology and geobiology to bioinformatics and computer science, our graduates are in a prime position to take up leadership roles in both academia and industry in order to drive the complex changes needed to advance sustainability of our knowledge-based society and economy in full alignment with the European Green Deal.*

Sustainable agriculture and soil health (3B)



Fredrik OLSSON HECTOR
(REA)

Chair

Head of Unit MSCA and citizens, COFUND, Global Postdoctoral Fellowships, European Research Executive Agency (REA)

Sandra HEINZELMANN
(DG AGRI)

Moderator

Research Programme Assistant, Directorate-General for Agriculture and Rural Development (DG AGRI)



Ana BEJARANO
(University of Trento)

Reducing the input of chemical pesticides in agriculture by Bacterial biocontrol agents (RhizoTalk) - MSCA Individual Fellowship (2017) project ID: 797028

Dr. Ana BEJARANO is a postdoctoral researcher at the University of Trento. Her research focus on understanding and exploiting soil microbial interactions and developing inoculant formulations for use in sustainable agriculture. Anna will present the MSCA-IF project called RhizoTalk.

*Abstract: Bacterial biocontrol agents (BCAs) represent a promising alternative to the use of chemical pesticides for the control of soil borne pathogens in sustainable agriculture. However, their widespread use is still limited, mainly due to their difficulty to adapt to new conditions in the soil and integrate within indigenous microbial communities. RhizoTalk focused on solving this problem and dedicated to increase knowledge of molecular interactions between soil microorganisms and developing consortia formulations that guarantee the establishment of bacterial BCA in the field. First, we investigated the functional and transcriptome response of the model plant-beneficial bacterium *L. capsici* AZ78 (AZ78) to most common diffusible communication signals (DCSs) released by rhizosphere-living bacteria. Our findings show how DCSs influence the ecology of *Lysobacter* spp. in the rhizosphere. Then, we identified helper bacterial strains able to boost the AZ78 capacity to release antibiotics and resist UV-light and desiccation and developed novel formulations of bacterial consortia with increased shelf life and tolerance to environmental stresses*



Inga REICH (McCarthy
Keville O'Sullivan
Planning & Environmental
Consultants)

Carabids as biocontrol agents for slugs in Oregon and Ireland (CaraSlug) - MSCA Individual Fellowship (2016) project ID: 750296

*Dr. Inga REICH holds a PhD on ecological requirement, conservation management and phylogenetics of the Lusitanian slug species *Geomalacus maculosus*. Between 2017-2020 hold a MSCA postdoc at Oregon State University and NUIG on conservation biological control potential of ground beetles for slugs and other crop pests. Since 2020, Inga is an Ecologist at Environmental Consultancy. Inga will present her MSCA-IF project called CaraSlug.*

Abstract: Ground beetles are the most significant natural enemies of slugs in agroecosystems and several studies have shown that slugs are a major part of their diet. Most ground beetle species do not exclusively eat slugs, and the presence of alternative prey is crucial for their survival during slug-free periods. However, alternative prey can also impact the pest consumption rate by being preferentially consumed.

This project assesses the potential of ground beetles as biocontrol agents against slugs and other pests in Oregon and Ireland and evaluates the influence of farm management and/or field margin structure on the abundance pest species, ground beetles and invertebrates which could serve as possible alternative prey for the beetles. The control potential is evaluated by examining the abundance of ground beetles in agricultural fields at times when pests cause most damage and

through molecular gut-content analysis using NGS to assess the breadth of their diet as well as real-time PCR to screen for specific pest species.

This research generates valuable knowledge aimed at working towards a more environmentally friendly approach to farming by reducing the use of toxic molluscicides.



Lars Stoumann JENSEN
(University of
Copenhagen)

New bio-based fertilisers from organic waste upcycling (FertiCycle) - MSCA Innovative Training Network (2019) project ID: [860127](#)

Dr. Lars Stoumann JENSEN is a professor of soil fertility and organic waste recycling at University of Copenhagen, Denmark. His research focuses on nutrient cycling in soils and agricultural systems, with a particular focus on Nitrogen and Phosphorus. He has published more than 180 scientific papers and has participated in more than 60 international and national research projects, many as the Principal Investigator. Lars will present the MSCA-ITN project fertiCycle.

Abstract: FertiCycle will provide a unique opportunity for early stage researchers to acquire the scientific knowledge and technical skills needed to develop new treatment and formulation technologies for the sustainable upcycling of organic waste resources into high-quality bio-based fertilisers required in a circular economy. In FertiCycle we will study 1) innovative waste processing technologies, 2) resulting fertilisers and soil conditioners, 3) crop nutrient utilisation and soil quality effects, 4) environmental impacts and 5) market development, regulations and stakeholder preferences. FertiCycle builds on the cradle-to-cradle concept and the vision is to be able to manage organic and nutrient containing waste streams much more intelligently.



Liliana LAI (University of
Navarra)

Identification of sporulation determinants that do not affect the expression and crystallization of Cry proteins in Bacillus thuringiensis (IberusTalent) - MSCA COFUND (2017) project ID: [801586](#)

Liliana LAI is a PhD student at the University of Navarra, where she belongs to the international program Iberus Talent. I conduct research both at the University of Novara and Bioinsectis, which is a Spin-off of the University. The overall goal of her thesis is to develop highly effective microbial-based insecticides to control mosquitoes, in particular, Aedes aegypti and Aedes albopictus.

Abstract: Bacillus thuringiensis (Bt) is the most used bio-based solution as an alternative to chemical insecticides. Bt is a Gram-positive bacterium that produces a parasporal crystals during its sporulative phase. Crystals are mainly composed of δ -endotoxins that are toxic to a large number of insects, nematodes and mites. The production of most insecticidal proteins in Bt depends on the main regulators of sporulation (Spo0A, SigK or SigE). In order to find sporulation factors that do not affect crystal proteins expression, we performed random chemical mutagenesis to select asporogenic variants. One of the candidates had a point mutation in the spoIIIAA gene. To validate this mutation, we performed site-directed mutagenesis in the acrystallophorous Bt strain BMB171. The mutant obtained was complemented with different plasmids producing δ -endotoxins. As a result, we obtained an asporigenous variant capable of generating parasporal crystals. This type of discoveries will allow us to develop biotechnological improvements in Bt-based bioinsecticides.



Ana SIMOES-MOTA
(University of Navarra)

New insights into organic fertilization from the perspective of soil quality (IberusTalent) - MSCA COFUND (2017) project ID: 801586

Ana SIMOES-MOTA is an Iberus Talent PhD student at the University of Navarra. Her passion on nature has led her to the path of soil science. Ana holds a BSc in Biology and Geology followed by a MSc in Agriculture engineering. Besides enjoying the challenges of being a researcher, Ana also does voluntary work related with environmental consciousness and with women empowering.

Abstract: In the search of agricultural systems closer to circular economy strategies and climate change adaptation, gaining knowledge on the net effect of organic fertilization in the sustainability of the whole system, and not only on yields, is strategic. The research goals of this project are therefore focused on studying the effect that the continued application of organic amendments or fertilizers has on the environment and soil quality focusing on different innovative aspects and methodologies to expand the knowledge already gained in this field. This includes micromorphology studies, and organic matter fractionation schemes allowing the identification of the fate of organic matter added to the soil, and its potential effects in soil functioning and the environment. The main objective of this work, can, in this context, be split into two different objectives: (i) Gaining knowledge on the effect of sewage sludge amendments on the soil physical and biological quality, as related to organic matter incorporation and (ii) Identifying the allocation and nature of organic matter associated to organic amendments in calcareous soils under different types of management

Clean energy (3C)



Renat BILYALOV (REA)

Chair

Deputy Head of Unit MSCA and citizens, COFUND, Global Postdoctoral Fellowships, European Research Executive Agency (REA)

Mark VAN STIPHOUT (DG ENER)

Moderator

Deputy Head of Unit, Directorate-General for Energy (DG ENER)

Mark VAN STIPHOUT is the Deputy Head of Unit of the Innovation, Research, Digitalisation and Competitiveness Unit, in DG ENER. Mark has over 10 years of experience on energy issues and for over 3 years he was a member of the Cabinet of European Commissioner Günther H. Oettinger, when he was Commissioner for Energy.



Richen LIN (University College Cork)

Direct Interspecies Electron Transfer in advanced anaerobic digestion system for gaseous transport biofuel production (DIET) - MSCA Individual Fellowship (2017) project ID: [797259](#)

Dr Richen Lin is a Lecturer in Environmental Engineering in University College Cork. He held a Marie Curie Individual Fellowship (2018-2020) investigating “Direct Interspecies Electron Transfer in Anaerobic Digestion”. His research has focused on the production of advanced biofuels/biochemicals in cascading circular bioenergy systems. This has led to over 50 peer-reviewed journal publications.

Abstract: Anaerobic digestion (AD) has been widely applied to produce biogas through complex communities of syntrophic bacteria and methanogenic archaea. However, AD can suffer from the inefficiency of biogas production, which fundamentally arises from the low efficiency of mediated interspecies electron transfer via hydrogen between bacteria and archaea. The overall research objective is to propose a future AD-based circular economy system, which produces biomethane as a transportation fuel. The research explores the mechanisms of direct interspecies electron transfer (DIET) in the presence of different conductive materials (such as highly conductive but expensive graphene and cost effective digestate derived biochar). Understanding how conductive materials stimulate DIET and promote methanogenesis will lead to more effective strategies for high-efficiency AD system design and operation. The biomethane production rate in the proposed system are enhanced by 20-40% as compared to existing AD technology.



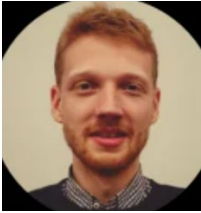
Simona LOHAN (Tampere University)

A network for dynamic WEearable Applications with pRivacy constraints (A-WEAR) - MSCA Innovative Training Network (2018) project ID: [813278](#)

Simona Lohan is a Professor at Tampere University and a Visiting Professor at UAB, Spain. She is a co-editor of the first book on Galileo satellite system (Springer "Galileo Positioning technology") and co-author in more than 250 international peer-reviewed publications. She is currently coordinating A-WEAR MSCA EJD network with 17 international units in the field of wearable computing.

A-WEAR is an international and multi-sectorial training network and joint doctorate programme on wearable computing. A-WEAR is funded by the EU Horizon2020 research and innovation programme under the Marie Skłodowska Curie grant agreement No. 813278.

Abstract: Motivated by the opportunities that next-generation wearable intelligence is expected to provide, the mission in A-WEAR is to cross-disciplinarily create new architectures, open-source software, and frameworks for dynamic wearable ecosystems, with distributed localization and privacy constraints. We have built 8 new joint and double European doctoral programmes to train a new generation of young researchers in order to be aware of, to cope with, and to disseminate to a large audience the vulnerabilities and the corresponding solutions of the communication and positioning through wearables. The expected impact of A-WEAR is to enhance the future social well-being, to contribute to an easy living, effective and enjoyable work, and to offer new solutions to the challenges of privacy invasion by communication and positioning through wearables and to the need of applying the right of the ownership to one's data.



**Bjarnhedinn
GUDLAUGSSON** (Teesside
University)

[Building energy performance \(DTA3\) - MSCA COFUND \(2017\) project ID: 801604](#)

Bjarnhedinn Gudlaugsson is currently an Early-Stage Researcher / a PhD Student (PhD title: "Development of a Decision support tool based on Sustainability Assessment and System Dynamic Modelling for Assessing Energy transition and New Energy Technology Integration into an Urban Energy System.") at the School of Computing, Engineering and Digital Technologies (SCEDT) at Teesside University.

Abstract: This project focuses on developing a dynamic sustainability assessment with the overall objective to assess the sustainability of energy transition policies and strategies for the Tees Valley region in the Northeast of England. Energy is a crucial component of our society and is entangled in most facets of society and critical to all economic activities. National and regional decision and policymakers are facing significant challenges concerning the enormous tasks of proposing energy transition policies, which foster energy transition without causing a negative impact on human life, the natural ecosystem and the economic system, while at the same time being expected to meet the target of 40% GHG emission reduction by 2030. The work carried out so far has resulted in a comprehensive list of 304 indicators along with a simplified causal loop diagram using the indicators and exciting system dynamic modelling from academic literature. The results highlight the interconnective relationships between the three-sphere of sustainability and the complex dynamic relationship within an energy system



**Juan Marcos RAMIREZ
RONDON** (Universidad
Rey Juan Carlos)

[smart grids \(GOT ENERGY\) - MSCA COFUND \(2016\) project ID: 754382](#)

Juan Marcos Ramírez Rondón received the B.S. diploma in electrical engineering, the master's degree in biomedical engineering, and the Doctor's degree in applied sciences at Universidad de Los Andes, Mérida, Venezuela, in 2002, 2007, and 2017, respectively. From 2017 to 2019, he worked as a postdoctoral intern at the HDSP group of the Universidad Industrial de Santander, Bucaramanga, Colombia.

Abstract: Smart grids belong to a class of energy management systems that allow the monitoring and control of the electrical power grid among the generation, transmission, distribution, up to the consumer meter. To offer efficient energy management, smart grids require high data transmission rates with nodes collecting a wide variety of information from heterogeneous and distributed network of sensors. Furthermore, this energy management modality should provide secure data transmission against no authorized operations. However, the large sizes of the power systems, as well as the diversity of distributed sensors, leads to high-dimensional data that challenge the storage and processing capabilities of the control stations. In this sense, compressive sampling has emerged as an acquisition paradigm that senses and compresses simultaneously the relevant information of the system under observation. In this context, the compressed data can be securely transmitted by continually updating the structure of the sensing matrix. Therefore, the development of a compressive sampling-based acquisition model is proposed which enables the reduction of the number of sensors in smart grids.

Laura COLLADO
(Universidad Rey Juan
Carlos)

ArtifUEL: artificial photosynthesis for the production of solar fuels and chemicals (GOT ENERGY) - MSCA COFUND (2016) project ID: [754382](#)

Laura Collado holds a PhD in Environmental and Chemical Engineering (2015, URJC) on solar fuels production by CO₂ valorization, development of multifunctional materials and advanced characterization studies. She did a postdoctoral stay at Heriot-Watt University (Scotland, UK). Then, she was awarded a GET-COFUND MarieCurie Fellow at URJC and IMDEA Energy to develop ArtifUEL project.

***Abstract:** ArtifUEL was born as a challenging technology to address the pressing energy demand and growing CO₂ emissions, while providing a fossil-free pathway to produce fuels and chemicals. To face this challenge, we present a novel artificial photosynthesis technology, powered by solar energy, to convert natural feedstocks (water, carbon dioxide and nitrogen) into fuels and high-energy chemicals. This complex approach requires the development of multifunctional catalysts to efficiently capture, convert and store sunlight, while simultaneously coupling optical, charge-transfer and catalytic processes at different timescales. The ground-breaking idea is to go a step further in this technology to approach it to reality. For that, we plan to scale-up the process to a semi-pilot plant and to use non-potable water from a wastewater treatment plant. This original and highly interdisciplinary work combines a multi-technique methodology with emphasis on operando spectroscopies and modelling, which will be used to determine the key factors affecting reactivity and selectivity in artificial photosynthesis. This research is conducted at URJC and IMDEA Energy.*

10 – 10.15AM **Break**

10.15–11.15AM PARALLEL THEMATIC PANELS (PART 4)

Eliminating pollution (4A)

Sandro RICCI (REA)

Chair

Deputy Head of Unit MSCA Staff Exchanges, European Research Executive Agency (REA)



Michael KLINKENBERG
(DG ENV)

Moderator

Directorate-General for the Environment (DG ENV)



Thomas ROCKMANN
(Utrecht University)

Reducing greenhouse gas emissions identifying and evaluating CH₄ emissions and support mitigation measures (MEMO2) - MSCA Innovative Training Network (2016) project ID: [722479](#)

Prof. T. Röckmann is chair for Atmospheric Physics and Chemistry at the Institute for Marine and Atmospheric research Utrecht (IMAU) of Utrecht University, The Netherlands. He is head of the Atmospheric Physics and Chemistry Group and, with his research group, he investigates the global and regional cycles of important atmospheric compounds. The core expertise of Prof. Röckmann is the use of isotope information to investigate trace gas budgets. One part of the research portfolio of Prof. Röckmann is the development of new atmospheric isotope measurement techniques. The other part is the application of these techniques to understand the sources and sinks of atmospheric gases in more detail.

Abstract: Emissions of the greenhouse gas methane (CH₄) are a major contributor to Europe's greenhouse gas emissions and global warming impact. Effective emission reduction can only be achieved if sources are properly quantified and mitigation efforts are verified. The goal of MEMO2 was to bridge the gap between large-scale top-down estimates from atmospheric monitoring programs and the bottom-up estimates of emissions of methane from local sources that are used in the national reporting. This was realized by a combination of I) developing and deploying new and advanced mobile methane measurements tools and networks, II) isotopic source identification, and III) modelling at different scales. MEMO2 ran smoothly and successfully, and ended in 2021. The quality and achievements of MEMO2 resulted in the declaration of MEMO2 as a REA Success Story.



Dongyu WANG (Paul Scherrer Institut)

MEMO2 was a H2020 MSCA European Training Network with 25 collaborators from 8 countries. The MEMO2 consortium successfully used mobile measurements on vehicles, bicycles, drone and aircraft measurement platforms for emission quantification at various scales, from local to regional. MEMO2 provided a huge amount of new, high-quality data sets of emissions from farms, waste water treatment plants, biogas plants, cities, landfills, oil and gas wells, coal mining ventilation shafts and larger fossil fuel production basins in the EU. Regarding the use of isotope data for improving methane source attribution, the results demonstrate that isotopologue measurements of CH₄ are a great asset for determining the origin of atmospheric CH₄.

Studying oligomer formation from peroxy radicals and their fate in atmospheric aerosols (PSI-FELLOW-II-3i) - MSCA COFUND (2015) project ID: [701647](#)

Dr Dongyu Wang received his Ph.D. in chemical engineering from the University of Texas at Austin in 2018. He is currently a postdoctoral researcher in the laboratory of atmospheric chemistry at Paul Scherrer Institut in Switzerland. His research focuses on the characterization of atmospheric gasses and particulate matters using chemical ionization mass spectrometry, (extractive) electrospray mass spectrometry, high-resolution (tandem) mass spectrometry, and machine-learning techniques.

Abstract: New analytical techniques for the real-time, near-molecular speciation of airborne pollutants were developed in this PSI-Fellow/COFUND project using extractive electrospray ionization, time-of-flight mass spectrometry, high-resolution mass spectrometry, and tandem mass spectrometry. In addition, investigation of the structure of short-lived organic radical species and their reaction products led to new insights regarding the underlying atmospheric processes (e.g. oxidation reaction mechanisms) responsible for the formation of high-molecular weight, low-vapor pressure organic oligomers, which can contribute to new particle formation and particle growth. Once formed, particles may go on to influence the earth's radiative balance either directly via light absorption/scattering, or indirectly by acting as cloud condensation nuclei. The technical developments in this project are advantageous for a range of environmental monitoring services, and the scientific insights gained could help to constrain air quality and climate models.



Pablo GAGO FERRERO
(Institute of Environmental Assessment and Water Research)

Development of a smart workflow based on high resolution mass spectrometry for the assessment of the performance of wastewater treatment technologies (SMART-WORKFLOW) - MSCA Individual Fellowship (2016) project ID: [747698](#)

Dr Pablo Gago Ferrero is an expert in environmental analytical chemistry. Currently, he is mainly interested in human exposure to organic chemicals. He uses advanced HRMS-based approaches to obtain a more comprehensive understanding of the universe of chemicals that accumulate in humans and link it to human health and changes in the metabolic pathways.

Abstract: Chemicals are part of our daily lives. Our activities emit a myriad of substances into the environment that result in continuous exposure of both humans and ecosystems to very complex chemical mixtures. A holistic characterization of that chemical exposure is a very challenging task.

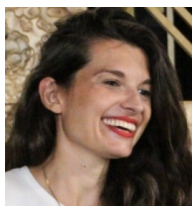
However, recent developments in instrumental analysis and data-mining strategies (such as non-target high resolution mass spectrometry (HRMS)), have opened up new possibilities to advance in this field, inconceivable 15 years ago. By combining ultimate developments in HRMS with advanced data-mining strategies, this project demonstrated that close collaboration between scientists and regulatory authorities is a promising way forward for enhancing identification rates of emerging pollutants and expanding knowledge on the occurrence of potentially hazardous substances in the environment. Also, these novel strategies were applied to evaluate human exposure to hazardous chemicals through advance biomonitoring studies (analysing biofluids and tissues) in individuals from different cohorts.

Marc EEMAN (Dow Silicones Belgium SRL)

Impact of air pollutants on cutaneous responses. (CITYCARE) - MSCA Innovative Training Network (2017) project ID: [765602](#)

Dr. Marc Eeman received his Ph.D. in Agricultural Sciences and Biological Engineering from the University of Liège. In 2008, he was appointed R&D Scientist at StratiCELL, a CRO for the in vitro objectivation of cosmetics. In 2010, he joined the Personal Care Dpt. of Dow Silicones Belgium SRL, where he gained a solid expertise in skin care.

Abstract: The skin is the first barrier against the external environment. The CITYCARE project aimed at better understanding the effects of air pollutants (O₃, cigarette smoke, particulate matter) on skin and at providing innovative technologies for better consumer protection. 3D in vitro reconstituted human epidermis models with either a healthy or a compromised barrier were first developed. After optimization of the exposure conditions, the responsiveness of the two models to different stimuli was investigated. Most of the pollution-induced damages occur at the skin surface and include the oxidation of lipids and proteins. No significant cutaneous responses were found in the viable layers of the epidermis whereas the secretion of oxidative stress and pro-inflammatory markers was observed in the culture medium of human keratinocytes exposed to air pollutants. This indicates that the integrity of the epidermal barrier is a key element for protecting the skin against air pollutants. This statement was confirmed with the studies carried out with the 3D epidermal model having a compromised barrier. The potential protective benefits of cosmetic ingredients are currently under investigation.



Chiara FARINEA (Institute for Advanced Architecture of Catalonia)

Building Urban Innovative Living Design Solutions (BUILDS) - [Erasmus+ Programme \(2017\) project website](#)

Dr Chiara Farinea is an architect and urban planner. She is currently Head of European Projects at the Advanced Architecture Group Department at Institute for Advanced Architecture of Catalonia (IAAC), Spain, her position includes being a coordinator and scientific personnel in several EU projects targeted at education, research, development and implementation and being faculty in IAAC educational programs.

***Abstract:** There is a growing recognition and awareness that nature can help to provide viable solutions by using and deploying the properties of natural ecosystems and the services that they provide in a smart and 'engineered' way. Working with nature can further pave the way towards a more resource efficient, competitive, and greener economy. But, why are nature-based solutions not used more often to address the current global urban challenges? One of the main reasons is the lack of interconnectedness and cooperation between the biology and biotechnology sectors with design, industry, and entrepreneurship experts and the lack of funding for disruptive and visionary solutions. Building Urban Intelligent Living Design Solutions (BUILDs) aims to give response to this challenge. BUILDs has developed an experimental transdisciplinary educational system that links the three disciplines of biology, intelligent design, and business throughout different activities, such as courses for students and trainers, symposiums, development of educational resources, the set-up of an accelerator programme, and more, for the creation of new networks for cooperation.*

Climate action (4B)



Fredrik OLSSON HECTOR
(REA)

Chair

Head of Unit MSCA and citizens, COFUND, Global Postdoctoral Fellowships, European Research Executive Agency (REA)



Katarzyna BALUCKA-DEBSKA (DG CLIMA)

Moderator

Policy Officer, Directorate-General for Climate Action (DG CLIMA)



Corrado ALTOMARE
(Universitat Politècnica de Catalunya – BarcelonaTech)

Amending the design criteria of urban defences in low elevation coastal zones through Composite-modelling of WAVE overtopping under climate change scenarios (DURCWAVE) - MSCA Individual Fellowship (2019) project ID: [792370](#)

Dr. Corrado Altomare is civil and coastal engineer and Marie Curie Postdoctoral researcher at Universitat Politècnica de Catalunya – BarcelonaTech (UPC), in Barcelona, Spain. He is an expert in experimental and numerical modelling of phenomena of interaction between sea waves and coastal defence structures. Dr. Altomare is core developer of the mesh-less open-source solver DualSPHysics.

***Abstract:** The growth in coastal zone population increases the exposure of large numbers of people to hazards related to climate change. This is true especially in low elevation coastal zones.*

Understanding the mechanisms that govern the interaction between overtopping waves and coastal defences to changing climate conditions is of utmost importance to amend the current design criteria of coastal defences. The project DURCWAVE aims to identify new design criteria for wave action by modelling wave overtopping and post-overtopping processes of urban defences and coastal assets. The project implements a composite-modelling approach, consisting of both physical and numerical modelling. Physical model tests were carried out in two different wave flume facilities. The mesh-free DualSPHysics model was used for numerical modelling. The EPR data-driven technique was employed to find new correlations between wave impacts and overtopping flows. The project is providing new insight to help decision-makers to estimate the vulnerability of coastal zones to climate change, by assess the threats for sea frontages and buildings on the coastline.



Susanna STRADA (The Abdus Salam International Centre for Theoretical Physics)

Unravelling the role of water stress in Mediterranean isoprene emissions to better project future regional climate-air quality interactions (IDIOM2) - MSCA Individual Fellowship (2018) project ID: [791413](#)

Born in Italy, scientifically matured in France and the US, Susanna STRADA is currently a climate scientist at the Abdus Salam International Centre for Theoretical (Trieste, Italy). Since her PhD, she has been interested in the interactions between atmospheric physics and chemistry in different contexts, from wildfires to surface-atmosphere interactions.

Abstract: In future, benefits from air quality strategies may be offset by changing climate. Rising temperatures and changing precipitation may alter emissions of biogenic volatile organic compounds (BVOCs) released by plants in response to drivers such as temperature and soil moisture. Among BVOCs, isoprene is the dominant compound that influences levels of an air pollutant and greenhouse gas such as ozone, thus affecting air quality and climate. Climate change in turn may alter isoprene emissions: a major uncertainty in air quality projections that reduces our ability to design effective mitigation strategies. In particular, it is crucial to better understand the behaviour of isoprene under water stress. For this reason, the IDIOM2 project has analysed global observations of formaldehyde, a chemical species used as a proxy of isoprene emissions, to estimate its trend and attribute this to drivers such as temperature and soil moisture. In parallel, regional climate modelling has allowed to assess the effects of soil moisture on isoprene emissions and surface ozone levels under present-day and future climates in the Mediterranean region, a high BVOC-source area and warm-dry climate.



Louis-Alexandre COUSTON (University of Lyon)

Modelling ice-shelf melting and ice-ocean processes via the phase-field method and direct numerical simulation (MIMOP) - MSCA Individual Fellowship (2018) project ID: [793450](#)

Dr Louis-Alexandre Couston graduated with a PhD from UC Berkeley in 2016. Louis was a postdoctoral researcher from 2016 to 2018 at IRPHE, a fluid dynamics research center in Marseille, France, and a Marie Curie postdoctoral fellow from 2018 to 2020 at the British Antarctic Survey in Cambridge, UK. He is now an assistant professor of physics at the Université de Lyon and at ENS de Lyon in France.

Abstract: The melting of ice shelves around Antarctica has increased in recent years, allowing faster

discharge and thinning of continental ice sheets into polar seas. To dates, most climate models do not have precise estimates for the ocean heat flux at the base of the ice, which controls melt rates. As a result, climate scientists rely on empirical laws for melting, which are not well constrained, and hence may compromise sea-level rise forecasts. The MIMOP project has demonstrated the possibility to conduct high-fidelity simulations of ice melting, opening the way for a rigorous approach to predicting melt rates in the environment. We have highlighted a numerical procedure, which, for the first time, can resolve the turbulent dynamics of oceans and the evolution of the ice-ocean interface via melting and freezing. Using this model, we demonstrated that narrow icebergs melt faster than broad icebergs, and we proposed a new predictive law for their melt rate that takes into account their shape. We also showed that an initially flat layer of ice adjacent to a turbulent flow experiences spatially-variable melt rates, such that topographical features spontaneously emerge.



Tabish NOORI (University of Alcala)

Microbial osmotic desalination with energy and nutrient recovery (MODERN - GOT ENERGY) - MSCA COFUND (2017) project ID: [754382](#)

Md Tabish Noori has completed PhD in Environmental Electrochemistry from IIT Kharagpur, India in 2018. Before joining Marie Curie fellowship, he worked at IIT Kanpur, India and Kyung Hee University, South Korea as postdoctoral researcher for brief period. His research interests are bioelectrochemical processes development for wastewater treatment, CO2 reduction and energy recovery.

*Abstract: Ternary wastewater (TW) is a major issue for leather industries in numerous EU countries. It contains high concentrations of organic and inorganic matters including Cr (VI) (~100 mg/l), which is a group 1 carcinogen. The existing treatment technologies for TW are complex and energy intensive due to heavy metals load. In this context, bioelectrochemical system (BES) can be utilized as an efficient and low-cost device to reduce Cr (VI) to Cr (II) at biocathode having metal reducing bacteria such as *Geobacter sulfurreducens*. *Geobacter sp.* has special proteins on their cell wall which they use to transfer intracellular electrons to Cr (VI) for reduction to survive acute metal toxicity. Hence, this property of *Geobacter* can be utilized for Cr containing wastewater treatment, e.g., TW. However, *Geobacter* can only tolerate up to 0.1 mM Cr (VI). Here, we proposed to improve the Cr (VI) tolerance limit of *G. sulfurreducens* via randomized mutagenesis techniques and use them as biocatalyst in a four chamber BES to remove several contaminants from TW in one step along with recovery of valuable biproducts. This is an interdisciplinary project and is aligned with the EU's 'Zero Pollution Action Plan' policy.*



Volkmar KIRCHER
(Montanuniversität
Leoben)

The European University on Responsible Consumption and Production (EURECA-PRO) - Erasmus+ European University Alliance - <https://www.eurecapro.eu/>

Dr Volmar Kircher studied Building Materials and Ceramics at the Montanuniversität Leoben (MUL) and became university assistant at the Chair of Ceramics there. In 2017, he completed his doctorate and was engaged in research activities, scientific publishing, teaching and project management. Since March 2021 he is working for EURECA-PRO at MUL as LEAD Coordinator for the EURECA-PRO RESEARCH Agenda.

Abstract: The European University on Responsible Consumption and Production has joined forces of 7 partner universities to become a true global actor and role model in the field of Responsible Consumption and Production (Erasmus+; No 101004049). The research covers Circular Production Industry from Exploration of primary resources via Processing of mined raw materials, Smart Production, Industrial Environment Engineering & Protection to Recycling of valuable materials. Responsible Production is linked to Consumption and therefore EURECA-PRO considers both, responsible Industrial Consumption & End/Private Consumption.

Three projects supporting the European Green Deal goal “to become climate-neutral by 2050” will be presented at the Green Deal Cluster event. The first project about Carbon Storage shows that Petrophysical Characterisation is crucial for identifying potential CO2 Reservoirs and subsequently reducing CO2 emissions to the atmosphere (ESP). Project 2 deals with Carbon (CO2) Capture & Use by means of Industrial Algae Production in Photobioreactors (AUT) and the project 3 demonstrates the necessity of Outdoor and Indoor Air quality analysis in the vicinity of industrial areas (POL).

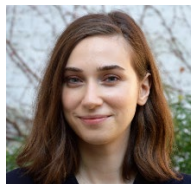
Green Transport (4C)



Jean-Bernard VEYRET
(REA)

Chair

Head of Unit MSCA European Postdoctoral Fellowships, European Research Executive Agency (REA)



**Luana BIDASCA (DG
MOVE)**

Moderator

Policy Officer, Directorate-General for Mobility and Transport (DG MOVE)

Ms Luana Bidasca is policy officer at the European Commission’s Directorate for Mobility and Transport in the Research and Innovation Unit. Ms Luana Bidasca develops urban mobility policy and Research & Innovative priorities for local transport authorities. Since March 2021, she has been supporting the Climate Neutral and Smart City Mission Manager. In her previous roles she worked for a wide range of non –governmental and city associations, developing policy or managing projects in the areas of road safety and risk mitigation, new mobility services and smart cities.



Jani-Pekka JOKINEN
(Aalto University)

The Economics of the Intelligent Transportation Services (ECOINTELS) - MSCA Individual Fellowship (2018) project ID: [800267](#)

Dr. Jani-Pekka JOKINEN is Academic Coordinator and researcher in Aalto University, Department of Industrial Engineering and Management. Dr. Jokinen has studied intelligent transport services in Finland and Germany, and he has developed economic theory and models of these services. He has published the results in leading transport economics and business journals. Jokinen finalized his doctoral thesis in the Aalto University, where he currently works as an academic coordinator and researcher.

***Abstract:** Technological advancements have enabled new flexible and demand-responsive transportation services, whose significance on both urban and rural transportation systems have been increased rapidly due to the successful transport network companies such as Uber and Lyft and due to innovative public transportation operators developing automated demand-responsive services with public-private-partnerships. At the same time, there has been also increasing interest in these services in several academic disciplines. Recently, research has focused on modelling these services and related pricing policies, and on developing algorithms for optimal vehicle routing and demand management for improving passenger experience and sustainability of the new transport services. The overall objective of the project was to achieve deeper understanding on the economics of the intelligent transportation services by extending the economic models of the automated demand responsive transportation (DRT) and by analyzing potential socio-economic impacts of the new transportation services.*



Zheng CHEN (Queen
Mary University of
London)

Hierarchical Optimal Energy Management of Electric Vehicles (HOEMEV) - MSCA Individual Fellowship (2019) project ID: [845102](#)

Dr Zheng Chen is currently a Marie-Curie Research Fellow with the School of Engineering and Materials Science, QMUL, UK. He has conducted over 30 projects and published over 130 journal articles and conference proceedings. His research is focused on control of intelligent electric vehicles. He is a fellow of IET, and a recipient of 2nd place of IEEE VTS Motor Vehicle Challenge in 2017 and 2018.

***Abstract:** It has been widely recognized that vehicle electrification provides a potential way for the EU to move towards a more decarbonized transport system and sustainable circular economy. To increase the market share of electric vehicles (EVs), control technology plays an indispensable role in improving the overall efficiency of EVs. The overarching objective of this project is to develop a novel computationally efficient hierarchical adaptive optimal control framework incorporating transportation information and drivers' habits suitable for energy management of EVs. To enhance the computational power of the framework, an effective fast optimization method, a novel velocity predictor with varying-prediction-horizon calibrator, and a fast MPC controller will be developed and embedded into the hierarchical control framework, so as to achieve multi-objective optimal control*

targets, i.e., maximum fuel economy, reduction of emissions, improvement of drivability and battery life extension. This project will sufficiently merge the critical information of human, road and vehicle with a hierarchical control framework to facilitate the energy management of EVs.



Davide LO PRESTI
(University of Palermo)

European Training Network on Sustainable Multi-functional Automated Resilient Transport Infrastructures (SMARTI) - MSCA European Training Network (2017) project ID: [721493](#)

Dr. Davide Lo Presti is an Assistant Professor, holder of the “Rita Levi Montalcini fellowship” at the University of Palermo (IT) and a Visiting Academic at the University of Nottingham (UK). His expertise is Smart and Sustainable Transport infrastructure and his research focuses on investigating smart solutions for preserving existing transport infrastructures as well as envisioning the future ones. Since 2017, Dr. Lo Presti is the Coordinator of SMARTI ETN programme.

Abstract: SMARTI ETN is allowing a new generation of researchers to take advantage of the exceptional format of the European Training Network offered by the European Commission and exponentially grow to become the seeds that will help transport infrastructure stakeholders in conceiving and implementing smart solutions for a sustainable design, construction and management of transport infrastructure. SMARTI ETN core is formed by eight institutions allocated in six countries: United Kingdom, Ireland, Denmark, France, Spain and Italy. Among the institutions, three universities, one public research centre and four private companies are involved. Each institution hosts one or several fellows providing all the necessary support for the development of their project. In addition to this, SMARTI ETN counts with the expertise of >20 associate partners around Europe, America, Asia and Australia. It is within this environment that the SMARTI fellows are developing their training-through-research path receiving advanced scientific training structured into network-wide “thematic” taught modules, combined with original research supported by secondments that expose them to both academia and industry.



Jinwen YE (University of Copenhagen)

First-mile ride-sharing problem (TALENT Doctoral Fellowship Programme) - MSCA COFUND (2018) project ID: [801199](#)

Jinwen Ye is a PhD student of the section Insurance and Economics in the University of Copenhagen. She is a graduate from The University of Minnesota Twin Cities, and her research interest lies in vehicle routing related problems, such as mobility sharing and transportation optimization, and solving these problems with optimization methods including Linear Programming, Mixed Integer Programming, Dynamic Programming, Stochastic Programming, etc. In UCPH she will do a PhD project about ride-sharing.

Abstract: The first-mile problem, which refers to the design of transport services for passengers to reach their nearby transit station, has attracted growing attention recently. Since the increased size of urban areas and population has raised road congestion and air pollution, urban planners realized that ride-sharing, which assigns multiple passengers to share a single vehicle, is an efficient approach for solving the first-mile transportation problem. In the existing literature, researchers designed the

mechanism for the first-mile ride-sharing service, and proposed a system integrated autonomous vehicle and public transportation in the first-mile problem.

Nevertheless, a key issue remains to be addressed. Usually, the supply of vehicles does not follow the distribution of demand. During the peak hours in the morning, there will be many customers who request to be delivered from home to the transit station, but far fewer requests with a destination to the area where people live. Thus the supply and the demand would be imbalanced in both the living area and the transit station. Vehicle rebalancing is to reposition the vacant vehicles, in order to serve future demand more efficiently. Doing research on efficient rebalancing methods is important because implementing rebalancing in the first-mile problem will reduce the fleet size and passengers' wait time, and thus improve the performance of the system.

The purpose of this project is to develop efficient planning methods for dial-a-ride problems. The concrete objectives are 1) to build optimization models for the process of order dispatching and empty car rebalancing, and 2) to develop efficient algorithms for the solution of the problem. The relevant methodologies for this project are Mixed Integer Programming (MIP), Reinforcement Learning (RL), Exact Algorithms and Heuristic Algorithms. The expected impact on current practice is that the efficient use of ride-sharing systems would likely to reduce emissions and congestions, and implementing rebalancing in ride-sharing systems would reduce the fleet size and passengers' wait time and thus improve the overall performance of the system.



Jianhua HE (University of Essex)

Cooperative Connected Intelligent Vehicles for Safe and Efficient Road Transport (COSAFE) - MSCA Research and Innovation Staff Exchange (2018) project ID: [824019](#)

Dr Jianhua is a Reader at University of Essex, UK. His research interests include 5G and 6G, connected vehicles, autonomous driving, Internet of things, smart transport, AI for computer vision and mobile computing. Dr He is the coordinator of EU Horizon2020 projects COSAFE and VESAFE. He has published over 150 papers. He is the TPC Chair of MobiArch'20 and ICAV'21 and an IEEE Senior Member. Abstract: Road accidents and traffic congestion are serious problems for global transport systems. More than 1.2 million people die each year on the roads due to road accidents. Connected vehicles and autonomous vehicles are two promising technologies that can improve road transport safe and efficiency, but they both have inherent shortcomings. This project proposes an innovative solution of cooperative connected intelligent vehicles, where vehicular communications technology and resource sharing and cooperation are exploited, to tackle the road transport challenges, and deliver enhanced road safety and efficiency. Advanced research technologies in vehicle communication, vehicle edge computing, machine learning, data fusion, advanced driving systems, and cellular network resource management will be applied to tackle the associated challenges. The resulting CIV technologies and applications will help reduce road accidents, improve transportation efficiency and reduce traffic congestion.

**11.30AM –
1.10PM**

CLOSING SESSION

Chair: Begoña ARANO, Head of Department, European Research Executive Agency (REA)

11:30AM-11:40PM

The MSCA and the Green Deal: trends, themes and challenges



Vilma KUULIALA (Ecorys)

Consultant, Ecorys

Vilma Kuuliala is an environmental and maritime consultant at Ecorys. She holds a PhD in Biodiversity Management from the University of Kent, UK, and a master's degree in Coastal and Marine Management from the University of Akureyri, Iceland. For the past four years she has been working on a range of research projects for the European Commission, including for DG Research and Innovation, DG Environment, DG Maritime Affairs and Fisheries and DG Mobility and Transport.

11:40 - 12:40AM

Round table: What's next for climate research and education?



Claire MOREL (DG EAC)

Head of Unit, Marie Skłodowska-Curie Actions (DG EAC)

Claire Morel is the Head of unit in charge of the Marie Skłodowska-Curie Actions for the mobility and training of researchers and the development of excellent doctoral programmes, at the European Commission. Before that, she was Head of Unit for international cooperation at DG Education, Culture, Youth and Sport of the European Commission, with particular focus on the international dimension of the Erasmus+ programme and international policy dialogues in higher education and youth issues with various partners of the EU in the world. She has worked several years with the countries neighboring the EU. Before that, she worked for the Tempus programme (for higher education modernisation), cooperating with Central Asian countries, and for the European Training Foundation, an agency of the EU based in Turin, on the reform of vocational education and training systems in the Eastern neighboring countries and Central Asia.



Bernd BIERVERT (DG
RTD)

Head of Unit, Ecological and Social Transitions, Directorate-General for Research and Innovation (DG RTD)

Dr. Bernd Biervert is Head of Ecological and Social Transitions Unit in DG Research & Innovation. He is responsible for, among other tasks: co-ordination of the R&I contribution to the European Green Deal (including the 'Fitfor55' package); lead and coordination of the R&I contribution to the New European Bauhaus; co-ordination of H2020 and Horizon Europe Cluster 5 and 6; Transition analysis; Dissemination and Exploitation of research results. Mr Biervert has previously served as Deputy Head of Cabinet in the Cabinet of Vice-President Maroš Šefčovič - Energy Union, and in the Cabinet of Vice-President Maroš Šefčovič - Interinstitutional Relations and Human Resources, but also as Member of the Cabinet of Commissioner Ján Figel' and Maroš Šefčovič - Education, Youth, Culture and Citizenship, and various other European Commission Services. He has a legal educational background (University of Freiburg/Germany, Institute for European Law, Senior Assistant, University of Freiburg/Germany,

Institute for Constitutional and Administrative Law, Junior Assistant) and is a qualified Judge.



Ignacio CALLEJA (EIT)

Senior Adviser EIT RawMaterials / Coordinator Cross-KIC Action on Circular Economy, European Institute of Innovation and Technology (EIT)

Ignacio Calleja joined the EIT RawMaterials – initiated and funded by the European Institute of Innovation and Technology (EIT), a body of the European Union – in September 2016 as thematic officer for Circular Economy and Recycling, leading the Circular Economy strategy. Before that, he worked at the European Commission where he dealt with European affairs, projects, and initiatives dealing with environmental issues, circular economy, industrial pollution, resources efficiency and recycling for over 10 years. He is currently coordinating the Circular Economy Action with the participation of six EIT Knowledge and Innovation Communities (KICs): EIT RawMaterials, EIT Climate-KIC, EIT Digital, EIT Food, EIT Manufacturing and EIT Urban Mobility. Knowledge and Innovation Communities are partnerships that bring together businesses, research centers and universities. He has been the chairman and board member of various steering groups, networks and projects, as well as president of the European Network of Environmental Research Organisations (ENERO), member of the jury of the European EMAS Awards 2014, and evaluator for different calls of FP7, Horizon 2020 and Ecolnnovation.



Eleni ZIKA (ERCEA)

Strategic Adviser, European Research Council Executive Agency (ERCEA)

Eleni Zika is a strategic adviser at the European Research Council Executive Agency (ERCEA). Over the last 20 years, Dr. Zika has been engaged in science policy and strategy development, focusing particularly on research and innovation. Her areas of interest are broad and include biotech, personalised medicine and public health, in addition to sustainability. She was the first Head of Programme of the Bio-Based Industries Joint Undertaking (BBI JU), a 3.7 billion Euros partnership between the EU and the industry. She has previously served as Head of Sector for Fundamental Life Sciences at the ERC and in the European Commission's Joint Research Centre. Before joining the EU institutions, Dr. Zika was responsible for international policy at the UK Medical Research Council. She is a Christine Mirzayan Science and Technology Policy Fellow of the US National Academies and holds a PhD in Genetics and Molecular Biology from the University of North Carolina at Chapel Hill.



**Janyl MOLDALIEVA
(UNEP)**

Coordinator, United Nations Environment Programme (UNEP)

Janyl Moldaliev is a Policy Officer at the United Nations Environment Programme (UNEP). She leads research and analysis and fosters policy partnerships with the EU institutions. Before joining UNEP, she worked with international development and research organizations, where she conducted assessments, developed and managed projects on (resource) governance, and advised stakeholders on policy design and program interventions. She has a Ph.D. in Public Policy and Policy Analysis from Maastricht University. She served as a visiting scholar at George Washington University

and Columbia University.

12:40 – 1PM



EU funding opportunities for “climate” R&I

Marlène BARTÈS (DG
EAC)

Policy Officer, Directorate-General for Education, Culture, Youth and Sport (DG EAC)

Marlène Bartès joined the European Commission in 2013, where she worked for the unit responsible for international cooperation and programmes in the field of education and training, focusing on collaboration with countries outside the EU. She has joined the Marie Skłodowska-Curie Unit in 2020, where she follows different files, including the “greening” of the programme and its contribution to the European Green Deal.

1 – 1.10PM



Virtual Exhibition winner announcement & closing remarks

Begoña ARANO
(European Research
Executive Agency (REA))

Chair

Head of Department, European Research Executive Agency (REA)

VIRTUAL EXHIBITION PROJECTS

WINNER OF THE VIRTUAL EXHIBITION: Biotechnology approaches for food waste valorisation (GOT ENERGY) – MSCA COFUND (2016)

María del Prado GARCIA-APARICIO, University of Alcalá, Department of Analytical Chemistry, Physical Chemistry and Chemical Engineering & 2Chemical Research Institute “Andrés M. del Río” (Alcalá de Henares, Spain)



1. BIODIVERSITY

Integrative ecological indicators of global change based on biocrust tissue traits (INDECRUST) - MSCA Individual Fellowship (2017)

Laura CONCOSTRINA ZUBIRI, Rey Juan Carlos University, (Móstoles, Spain)

Abstract

In order to monitor trends in global changes and predict their impacts on ecosystems, scientists and policymakers are in a constant search for integrative, cost-effective indicators. Functional traits have emerged as practical tools to track environmental changes (response traits) and assess their effects on ecosystem processes (effect traits). However, traits of organisms other than plants; such as soil lichens and mosses (biocrusts), are still largely unexplored. Nevertheless, biocrust traits such as stable isotope ratios, nutrient content and pH are easy to measure, highly sensitive to environmental changes and integrative. Also, biocrust tissue traits have an anticipatory character; shifts in their values will, in turn, affect other ecosystem processes and components. INDECRUST aims to assess the suitability of biocrust tissue traits as integrative indicators of global change and its impact on ecosystem properties and functioning. This project involves manipulative experiments, cutting-edge laboratory analyses and advanced statistical analyses. INDECRUST outputs will improve and complement the existing tools for environmental monitoring and policymaking in Europe.

Project ID: [795380](#)

Dolphinfish living in a warming ocean: How global climate change is reshaping the distribution, physiology and behaviour of marine migratory species and their associated fisheries (Co-tRiP) - MSCA Individual Fellowship (2016)

Dr. Andres A. OSPINA ALVAREZ, Mediterranean Institute for Advanced Studies (IMEDEA) Spanish National Research Council (CSIC) & University of the Balearic Islands (UIB) (Palma de Mallorca, Spain)

Abstract

Co-tRiP addressed the ecological and socio-economic consequences of climate change on Dolphinfish in the NW Mediterranean. Co-tRiP found for the dolphinfish in the NW Mediterranean that: 1) its predicted spawning habitat shows a remarkable expansion from the 1990s to the last; 2) its maximum expansion range was reached in the 2000s; 3) its reproductive period has been extended, bringing forward the onset of reproduction and delaying its end; 4) between 20 and 60 more days in the year may now be suitable for its reproduction compared to the 1980s and; 5) its temperature-mediated larval development and growth is also predicted to have accelerated. Overall, climate change could be signifying an increased recruitment rate for dolphinfish. Although fishery catches may affect the size of populations, making them more sensitive to other stressors such as climate change, and reduce their reproductive potential, small-scale fisheries targeting dolphinfish in the NW Mediterranean are reasonably well managed through strict control of the number of boats, allowed exclusion by date and self-imposed quota limits agreed by fishers to control prices.

Project ID: [746361](#)

Global patterns of intraspecific variation in tree resilience to drought (TreEsilience) - MSCA Individual Fellowship (2017)

Lucía DESOTO - Previously: Experimental Station of Arid Zones (EEZA), Spanish National Research Council (CSIC) (Spain)

Abstract

Forests provide essential long-term ecosystem services, such as the conservation of biodiversity or the reduction of greenhouse gas emissions. Consequently, preserving forests has been the focus of many conservation policies. Drought events associated with climate change reduce tree growth and prompt tree mortality episodes, impacting globally and severely on forest ecosystems. TreEsilience project has studied the ability of trees to resist and recover from drought (tree resilience) that will be decisive to maintain the functioning of these ecosystems. TreEsilience has taken the advantage of world-wide databases of tree-ring data that allow evaluating immediate effects of past droughts. To date, TreEsilience provides the empirical evidence linking low growth resilience to past droughts with increased risk of tree mortality across many species and regions. Growth components of resilience to current droughts should be considered as a promising proxy to assess future mortality risk at individual tree level. TreEsilience aims bringing new handy tools to identify early signals of mortality and improving our capacity to forecast and manage forest die-off under future climates.

Project ID: [797188](#)

Creative Food Cycles – Creative Europe Programme

Jörg SCHRÖDER, Leibniz University Hannover

Abstract

CREATIVE FOOD CYCLES aims to enhance innovative and creative practices between food, architecture, and cities in a transnational and European perspective: (1) to boost circular economy and increase regional food systems as a cultural vehicle of identities, innovation, social integration, and sustainable development; (2) to foster the exchange of knowledge and good practices in food/design interactions in Europe; (3) to contribute to reduce skill-gaps and to empower capacities of architects, product designers, and urban designers in urban resilience, the use of digital technologies, and in co-creation; (4) to enhance audience development in terms of participation in urban transformation processes; (5) to increase the visibility of the role of European architects and designers in initiating and implementing FOOD CYCLES in cities. The project has been co-funded by the Creative Europe Programme in 2018–21, developed and realised by three cooperating artistic-scientific groups from Leibniz University Hannover LUH (leadpartner), Institute of Advanced Architecture of Catalonia IAAC, and University of Genoa UNIGE, that transform urban spaces into laboratories of CREATIVE FOOD CYCLES.

[project website](#)

Roots & Seeds XXI – Creative Europe Programme

Claudia SCHNUGG (Roots & Seeds XXI Advisor)

Abstract

Roots & Seeds XXI. Biodiversity Crisis and Plant Resistance (2020-2022) is a cultural project that aims to establish bridges that help alleviate this delay. Through the creation of new imaginaries arising from the intersection of Art and Science, Roots & Seeds XXI it will seek to promote practices that resonate with a wider audience. Throughout the two years that the project will last, we will produce events and activities that generate connections between artists, philosophers, botanists, activists, economists, designers and curators, with the intention of generating dialogues and charting new paths that place the plant world in the center. Understanding the plant world as an agent and not a resource, we will try to imagine new ways of relating to it. The activities that we will develop (calls for art production, talks, publications, exhibitions, among others) will operate at the intersection of Art and Science, and with them we will promote habits that

directly affect the crisis of plant biodiversity. A crisis whose causes and ramifications are impossible to address without transcending the borders that divide the areas of knowledge with which we have been operating for years.

[project website](#)

European Alliance on Interdisciplinary Learning and Business Innovation for Urban Forests (UForest) – Erasmus+ Programme

Erica ALGHISI, ERSAF - Agency for Agriculture and Forestry of the Lombardy Region (Italy)

Abstract

According to the UN Department of Economic and Social Affairs, 74.5% of EU's population live in urban areas and this trend is expected to increase to 83.7% in 2050. This increase in urban population is expected to have a negative impact on air quality. Air pollution caused by industry and transport are a major crosscutting health hazard also with a high incidence of respiratory disease. In parallel, urban areas are facing an expected increase in urban temperatures (urban heat islands) due to climate change. Overall, these megatrends are reflected in increasing costs for public infrastructure and healthcare sectors, which struggle to find innovative and interdisciplinary solutions. Recent studies have shown that nature-based solutions such as urban forestry, often delivered through public-private partnerships (PPP), can provide cost-effective solutions to these challenges, while also mobilising a series of additional socio-economic benefits, enhancing urban resilience and liveability. The purpose of Uforest project is to contribute to the development of Urban forestry entrepreneurial and innovation opportunities and attitudes by improving interdisciplinary skills, among university students, PhDs, practitioners, researchers and information and communication technologies.

What's new and different: Uforest will create the first business-research-students-professionals-public sector cross sectoral alliance, bringing together the urban planning and architecture (architects, urban planners) with forest ecology (forest owners and agencies), with socio-economic and ICT sciences in order to provide training and support young scientists and practitioners working toward innovative UF projects. Innovation: Scientific evidence on UF is well-known. However, we lack interdisciplinary training and knowledge on how to best involve citizens and private and public sectors. Therefore, Uforest will look and approach the UF research & teaching from an entrepreneurial perspective. It will do this through a cross-sectoral partnership; step-bystep blended training, staff mobility, a project work competition and the twinning between researchers/students and UF businesses.

[project website](#)

2. SUSTAINABLE AGRICULTURE AND SOIL HEALTH

The Wine Lab - Generating Innovation between Practice and Research – Erasmus+ Programme

Prof. Alessio CAVICCHI Full professor in Agribusiness, Rural development and Branding, University of Macerata

Abstract

EU project The Wine Lab - Generating Innovation between Practice and Research creates the foundation for a dialogue among research, business and regional communities, including Universities in Agriculture, Oenology and related fields, and small wineries, mainly those located in disadvantaged areas, to stimulate knowledge flow, share challenges and solutions, and jointly generate and accelerate innovation in the wine sector. The project fosters clustering and networking, provides for learning opportunities, applies action alongside experiential research and learning and capitalises on knowledge towards new methods and approaches in policy planning.

The project provides for the development of:

- hubs as groups of interest and learning communities

- opportunities for higher education students to develop entrepreneurial and intrapreneurial mindset;
- innovative methods and tools to exploit knowledge at regional level, and link regional to national and European levels;
- tools and instruments able to provide timely and tailored answers to learning needs;
- policy debates through dialogue between regional hubs and decision-makers.

This model of intervention can be further mainstreamed to other fields such as food production and agri-tourism.

[project website](#)

Circular Business Models for Sustainable Urban Food Systems – EIT Food

Prof. Paola De Bernardi (Turin, Italy)

Abstract

It is estimated that by **2050**, there will be approximately **9 billion people** living on Earth, with almost 70% of them projected to live in urban areas. This increase in the global population is projected to require three times more resources than we currently use. We need a circular alternative to the linear “take, make, and dispose” system, however, **only 8,6% of the world can be currently defined as circular**. Considering the central role that global food systems have in the context of population growth, urbanization, and economic development, this MOOC investigates how we can help design and build circular food systems that foster the transition toward sustainable cities. The course provides, first, a **practice-oriented introduction** into the Circular Economy concept as applied to food systems in the context of SDGs, considering the **power of cities** to lead the shift to a more **regenerative and healthier global food system**. It then leads the learner toward discovering the key challenges and opportunities involved in **designing circular business models**. Finally, the course explores the catalytic role of cities and how they can seize networked, customer driven and multi-stakeholder opportunities to drive the circularity of Urban Food Systems.

[project website](#)

3. CLEAN ENERGY

Sustainable energy demand-side management for GREEN Data Centers (GREENDC) - MSCA Research and Innovation Staff Exchange (2016)

Prof. Habin LEE, Digital Business Analytics, Brunel Business School, Brunel University (London, United Kingdom)

Abstract

The GREENDC project contributes to greener data centres by developing a decision support tool that helps data centre managers predict energy demands better and evaluate strategies to minimize energy waste and CO2 emissions. GREENDC adopts a non-linear energy forecasting model and provides a simulation tool based on a simulation model to allow data centre managers conduct what-if analysis considering factors for energy demands and supply. GREENDC is implemented through knowledge exchange between two academic partners and three industrial partners. Academic partners transfer knowledge on non-linear energy demand forecasting and dynamic simulation to industrial partners while industrial partners transfer their knowledge on data centre operations through secondment activities. The outcome of the GREENDC activities are expected to reduce CO2 emissions and energy waste due to inefficient operations of data centres across the Europe.

Project ID: [734273](#)

Towards Stable and Highly Efficient Tin-based Perovskite Solar Cells (TinPSC) – MSCA Individual Fellowship (2016)

Feng WANG, Assistant Professor, Linköping University LiU (Linköping, Sweden)

Abstract

Solar cells are considered as one of the most promising renewable energy resources that can meet growing energy demand and mitigate greenhouse gas emissions. Impressively, solution-processed lead halide perovskites have attracted a great deal of attention in photovoltaic applications with an incredible device efficiency improvement from 3.8% to 25.2% during the past ten years. Unfortunately, these perovskite devices suffer from the toxicity of Pb and poor stability against moisture and heat, which are key challenges for their practical applications. A promising alternative is lead-free perovskite-double perovskites (A₂M+M₃X₆) with carriers diffusion length over 100 nm, as demonstrated in our previous work. In this project, we decreased the bandgap by ~0.26 eV by a novel crystal-engineering strategy, reaching the smallest reported bandgap of 1.72 eV for Cs₂AgBiBr₆ at ambient conditions. Besides, we have devised a unique recipe for traditional hole transport layer to enhance their stability against moisture and heat with sacrificing the device efficiency (patent application ongoing). Project ID: [751375](#)

Novel hybrid thermoelectric photovoltaic devices: modelling, development, and characterization (HTEPV) - MSCA Individual Fellowship (2016)

Dr. Bruno LORENZI, PhD, Department of Materials Science, University of Milano Bicocca (Milan, Italy)

Abstract

This project aimed at the practical realization, the study, and the commercial evaluation of optimized hybrid thermoelectric – photovoltaic (HTEPV) devices for the efficient harvesting of solar energy. It is in fact well known that common photovoltaic (PV) cells have limited efficiencies, since most of the incoming power is lost as heat. Thermoelectric generators (TEGs), which convert heat into electricity, may be used to recover these losses, enhancing the effectiveness of solar cells. More efficient PV systems can lead to a lower cost of solar harvesters, and to a wider availability and diffusion of this kind of renewable energy in the European community. This can in turn help to meet the important goal of lowering the use of fossil fuel, and reduce the emission of CO₂ in the atmosphere.

The overall objective of this action was the practical development of two kind of HTEPV prototypes, achieving performances higher by more than 25% than the PV cell alone. This innovative kind of harvesters were realized with special solar cells (less sensitive to temperature increases), a TEG part with optimized design, and a proper encapsulation to prevent heat losses.

Project ID: [745304](#)

4. ELIMINATING POLLUTION

Biopolymer based membranes for waste water filtration (WaterSEED) – MSCA COFUND (2014)

Emanuel DINIS, Wetsus and MST - Twente University (Netherlands)

Abstract

The efficiency of anaerobic treatment technology is limited by the washout of microorganisms and slowly degradable compounds. Membrane bioreactors (MBR) can be used to improve the retention of solids. However, membrane fouling hampers the current use of anaerobic MBR. Membrane fouling is (partially) caused by the deposition of microbial extracellular polymeric substances (EPS) on the membrane. The EPS are microbial polymers produced during the degradation of wastewater. Studies with aerobic membrane bioreactors have shown that the EPS can form a layer that dictates the filtration performance. This project hypothesized that it is possible to create an EPS layer by depositing anaerobic EPS on a porous carrier. The functional layer would improve the overall performance of anaerobic treatment. Several factors, such as EPS composition and carrier characteristics, can affect the formation and performance of the EPS

layer. The research focused on understanding how the polysaccharides/proteins composition of EPS impacts the formation of the layer and its filtration properties. And how the increase in carrier pore size could be overcome by carrier material affinity towards EPS.

Project ID: [665874](#)

Diffuse phosphorus input to surface waters - new concepts in removal, recycling and management (P-TRAP) - MSCA Innovative Training Network (2018)

Thilo BEHRENDTS, Associated Professor at the Faculty of Geosciences (Utrecht University, Netherlands)

Abstract

The flux of phosphate (P) from agricultural areas to surface waters is wasting a resource which is becoming scarce and is in conflict with the principles of a circular economy. Enhanced loading of surface water with P is the main cause for eutrophication and presents a key challenge in meeting the objectives of the EU Water Framework Directive. P-TRAP targets both problems and develops new methods and approaches to trap P in drained agricultural areas and in the sediments of eutrophic lakes. Trapping of P involves the application of iron(Fe)-containing by-products from drinking water treatment. P-TRAP aspires the ideas of a circular economy and aims at recovering the retained P in agricultural systems. Novel microbial technologies will be developed to convert P-loaded Fe-minerals into marketable fertilizers whose suitability will be evaluated. The new P-TRAP technologies have in common that they rely on the naturally strong connection between P and Fe and the innovative P-TRAP strategies will be underpinned by process-orientated investigations on the behavior of P during the transformation of Fe minerals. The latter are key in trapping and recycling of P in agricultural systems and lakes. P-TRAP establishes a framework of partners from multiple science and engineering disciplines. Integration of non-academic partners from various stakeholder groups into the P-TRAP consortium paves the way for direct implementation of the acquired knowledge. P-TRAP provides Early Stage Researchers (ESRs) an environment for conducting innovative scientific research by using state-of-the-art methodology. Training through P-TRAP increases the ESRs' mobility between sectors, cultures, and nations and strengthens their responsibility to exploiting scientific results for societal and economical benefit. P-TRAP will offer ESRs an excellent starting point for a career of leadership in a number of environmental and sustainable business sectors, academia, and public administration.

Project ID: [813438](#)

Renewable Energies for Water Treatment and REuse in Mining Industries (REMIND) - MSCA Research and Innovation Staff Exchange (2018)

Salvatore STRAFACE (University of Calabria)

Abstract

Renewable Energies for Water Treatment and REuse in Mining Industries (REMIND). The overall aim of REMIND is to develop an innovative framework of interplay between Renewable Energy Sources (RES) and innovative Water Treatment Technologies in the logic of a sustainable growth for mining industries. The novel paradigms explored are expected to drastically reduce the environmental impact due to extensive water and energy consumption, and to release untreated wastewater during the production cycle of copper and gold. The REMIND collaborative network among European Union, Chile and Ecuador is in line with EU policy and strategy for raw materials supply; moreover, this partnership supports the economic and research efforts of Latin American countries towards a more eco-friendly and RES-driven development. REMIND brings together 8 leading High Education Institutions and Large Companies from 4 Countries (Italy, Spain, Chile and Ecuador): Università della Calabria (UNICAL); Universidad de Sevilla (USE); Politecnico di Torino (POLITO); ABB Chile (ABB); Cámara de Comercio Italiana de Chile (CCI); Rina Consulting Spa (RINA-C); Escuela Superior Politécnica de Chimborazo (ESPOCH) and Universidad Adolfo Ibáñez (UAI).

Project ID: [823948](#)

5. CLIMATE ACTION

Paleosalinity reconstruction with hydrogen isotopes (NESSC) - MSCA COFUND (2018)

Katrin HATTIG (Utrecht University)

Abstract

To understand future climate change, it is helpful to be able to reconstruct past climate change and its impact on the environment. Paleosalinity, which is correlated with the seawater isotopes, is one of the most important oceanographic parameters which cannot be reconstructed with reasonable accuracy based on sedimentary records yet. One tool to reconstruct paleoenvironmental conditions is to measure stable isotopes on fossilized biological material. Oxygen isotopes of calcitic shells reflect the ambient temperature and salinity of the seawater dependent on fractionation processes. Culture studies showed that hydrogen isotopic fractionation of phototrophic organisms depends heavily on salinity, this makes algal and bacterial biomarker lipids potentially applicable paleosalinity proxies. With conducting multiproxy research using both oxygen and hydrogen isotope ratios measured on sediment core samples, we aim to reconstruct ambient water isotope shifts more confidently, and therefore, changes in salinity during the Cenozoic.

Project ID: [847504](#)

DASH of Water – water distribution (LEaDing Fellows) – MSCA COFUND (2015)

David B. STEFFELBAUER, Associate Professor for Hydroinformatics, Water and Wastewater Group, Department of Civil and Environmental Engineering, Norwegian University of Science and Technology (NTNU)

Abstract

In many cities, years of stringent financial constraints on water utilities, unoptimized operations and the unaffordability for utilities to maintain and replace their ageing infrastructure has resulted in dramatically growing leakage levels. Consequently, a quarter of treated water is lost in Europe's water distribution systems before reaching the customers.

Nowadays, an increasing number of utilities use hydraulic models to design and operate their systems in a more efficient way. However, measurements in water distribution are scarce, which results in inaccurate computer models. Recently, smart meters have become available that measure and transmit water usage of households to utilities in real-time. DASH of Water makes water distribution simulation software fit for the future, by exploiting this new Big-data source and start a new era in hydraulic modeling, aiming to increase the operational efficiency of our drinking water systems and save our precious water resources. Examples on a wide range of real-world applications show how these new models might increase the efficiency of drinking water systems by, e.g., enabling faster detection and localization of leaks.

Project ID: [707404](#)

Variability and change of cloudiness diurnal cycle over the past 30 years: a global analysis based on polar-orbiting satellites (POLONEZ) – MSCA COFUND (2014)

Jędrzej BOJANOWSKI, Remote Sensing Center, Institute of Geodesy and Cartography, Poland

Abstract

The evolution of clouds remains one of the most unknown aspects of the changing climate. Due to complex interactions with solar radiation clouds control the radiation budget on Earth. Despite their importance for the climate system, the evolution of the net radiative effect of clouds with the global warming is not fully understood. This project focused on an overlooked aspect of changes in the diurnal cloud formation. In the cloudiness diurnal cycle, significant climate

signals were revealed based on satellite data. A difference between minimum and maximum cloudiness during a day decreases over the oceans (up to 4% per decade). A local time of maximum cloudiness reveals positive trends, mostly over the ocean, with values exceeding 1 hour per decade. A shift in a diurnal cycle of cloudiness causes a change in the radiation balance, given that incoming solar radiation and emitted thermal radiation have a distinct diurnal fluctuation. Our findings contribute to a better understanding of clouds' response to global warming. This in turn leads to a reduction of uncertainty in future climate projections that are essential to design mitigation strategies such as the European Green Deal.

Project ID: [665778](#)

WINNER: Biotechnology approaches for food waste valorisation (GOT ENERGY) – MSCA COFUND (2016)

María del Prado GARCIA-APARICIO, University of Alcalá, Department of Analytical Chemistry, Physical Chemistry and Chemical Engineering & 2Chemical Research Institute “Andrés M. del Río” (Alcalá de Henares, Spain)

Abstract

The increased pressure on the environment has driven the search for sustainable technologies based on renewable raw materials to meet overall targets of food, energy, and chemicals. Concurrently, there is an increasing demand of replacing proteins, synthetic preservatives, flavors, aromas, and colorants by compounds of vegetable origin. The food processing industries generate large amounts of wastes that are presently underutilized. These byproducts are comprised mainly of an organic fraction with carbohydrates, proteins, and lipids; but also, of natural bioactive compounds that can be exploited within a biorefinery by means of biotechnology. The present project will primarily focus on the biorefinery assessment of selected plant-based food byproducts in terms of chemical composition, bioactive profile, antioxidant capacity, and enzyme accessibility of the carbohydrate fraction after different drying treatments. This type of studies is essential to develop technologies for a circular bioeconomy system, resulting in additional revenue for the food-processing sector while reducing its environmental footprint.

Project ID [754382](#)

European hub on new challenges in the field of essential oils (EOHUB) – Knowledge Alliance

José L. GARCIA RODRIGUEZ (Polytechnic University of Madrid)

Abstract

EOHUB will contribute to achieve smart, sustainable and inclusive growth, through stimulating entrepreneurship and innovation in the field of EOs, fitting within the EU 2020 strategy. EOHUB aims to increase the capacity of higher education institutions and business to integrate research results and innovative practice into the educational offer, and to exploit the potential for marketable process, methods and services in the field of BAEOs. Moreover, it helps graduates and PhD students to develop new entrepreneurship activities and marketable services in line with their curricula, which too often remain only at the level of “theoretical applications” and “case studies”.

The project responds to changing needs of the modern economy, anticipating new careers in line with the global challenges and issues of climate change, ecosystem services and biodiversity degradation.

EOHUB will create a supporting EU hub linked with associations of economic sectors, and with association of research institutions strictly linked with the project topic to increase the EU governance and to ensure funding after the project time-life.

[project website](#)

Creating Bioplastics from Industrial Organic Waste (B-PLAS DEMO) – EIT Climate

Cristian TORRI (University of Bologna)

Abstract

Polyhydroxyalkanoates (PHAs) are promising polyesters, produced by bacteria through aerobic fermentation of various carbon sources. Residues from biological processing, including sludge from wastewater treatment (WWT sludge) plant, digestate from anaerobic digestion of food waste and agricultural residues are actually an increasingly important residual mass flow. This flow at EU level can contain roughly 10-12 Mton/y of renewable carbon (36-44 Mton CO₂eq) and represents a resource that, whereas intercepted, will allow to obtain renewable materials, and/or renewable fuels, or besides environmental benefits. Starting from needs (renewable, biodegradable and cheap bioplastic) and addressing the problem of residues, B-PLAS use an improved approach that includes several advances with respect to the state-of-art. Thermochemical pretreatments allows to treat scarcely fermentable residues. Extended on Europe-wide scale the potential impact of B-PLAS DEMO process can avoid 140 Mton of waste sludge, while generating a significant amount (up to 2 Mton) of a new advanced bioplastic. Increasing the percentage of by-product streams and re-used waste flowing into value chains, and will increase the percentage of sustainable secondary and renewable feedstocks into the production of new high-value products in urban areas.

[project website](#)

Digital Twin towards zero-defects manufacturing (ZDM) and circular economy (TWINGOALS) – EIT Manufacturing

Joseba BILBATUA (Mondragon Corporation), Gorka UNAMUNO (Ideko – Research Centre), Clarissa GONZALEZ (Chalmers University)

Abstract

Digital Twins are virtual models of a process or product that digitally reproduce with maximum accuracy the behaviour and performance of their real version to which it is twinned. In this project, digital twins of production processes, and assets will be developed and used to solve specific problems of machine tool builders and end users. TWINGOALS will impact at machine tool manufacturers, which will benefit from its application during design, engineering, commissioning, maintenance, and servicing of machines and end users, particularly optimizing the creation and verification of reliable CNC programs, proper maintenance strategies and machine efficiency, so the energy and raw material consumptions are reduced to the minimum.

[project website](#)

6. GREEN TRANSPORT

Clean energy and low-carbon transitions in the XXI century: economic and policy analysis (GOT ENERGY) – MSCA COFUND (2016)

Jens PETERS (Universidad de Alcalá)

Abstract

The project aims at evaluating the efficacy of policy measures for achieving a more sustainable energy system. With an explicitly regional focus it aims at providing support for an evidence-based policymaking. A focus is put on renewable energy policy and the transport sector, being these two key sectors with very different societal implications. Especially in the transport sector, numerous measures have been taken in the last years by local administrations for incentivizing alternative mobility, but the efficacy of the measures for achieving decarbonization targets is mainly unknown. The project, conducted at UAH, Department of Economics in collaboration with IMDEA Energía targets this gaps and analyses the impact of policy measures on the uptake of alternative fuel vehicles, urban traffic and corresponding emissions by combining econometric techniques and open data streams with industrial ecology tools like life cycle assessment and material flow analysis. Project ID [754382](#)

FILION: Fiber Bragg Grating-based Fast and Precise Internal Monitoring of Lithium-ion Batteries in Electric Vehicles (MULTIPLY) - MSCA COFUND (2015)

Nand KISHOR MEENA (Aston University)

Abstract

An Electric Vehicle (EV) equipped with a Lithium-ion battery (LIB) is one of the sustainable alternatives to conventional internal combustion engine-based vehicle. LIB has shown many advantages over its present counterparts; however, it also has extreme safety concerns. Therefore, it requires electronic control and triggers the LIB designs with built-in sensors. The Fiber Bragg Grating (FBG) sensors are the most promising one for the fast and efficient monitoring of LIB cells. However, the technology is in the research stage, not fully developed and commercialized. The goal of this project (FILION) is to design an FBG-based sensing system for real-time state-of-health (SOH) and state-of-risk (SOR) monitoring of LIB cells; here, SOR refers to the thermal runways. Internal cell-level temperature and strain sensing offer the safe and fast charging of EVs at charging stations. It will enhance cell performance and facilitates reliable second life application of EV batteries in stationary energy storage. The safe second-life use of old EV batteries in stationary energy storage is expected to save metric ton carbon emission caused by battery manufacturing and disposal at the end of life.

Project ID [713694](#)

Noise and vibration in eco-efficient powertrains (ECO DRIVE) - MSCA Innovative Training Network (2019)

Bert PLUYMERS (KU Leuven)

Abstract

With increasing regulatory pressures to reduce emissions, road transport has to play its part. Over the next 30 years, as we shift towards EVs, downsized IC engines and hybrids with eco-powertrains will be central to the automotive sector. ECO DRIVE will develop new technologies for the testing and simulation of eco-powertrains, addressing the complex challenges related to combustion noise, the irritating sound from electric motors, transmission-induced NVH (Noise, Vibration and Harshness) and driveline torsional vibrations, leading to new designs with improved eco-efficiency and NVH performance.

ECO DRIVE offers a multi-disciplinary research-training program to the ESRs, with the ultimate aim being to create a new generation of NVH professionals for the transport sector. The technical-scientific challenges are tough: to investigate highly innovative simulation, testing and signal-processing methods for advanced NVH analysis and the engineering of downsized IC engines, e-motors, and novel lightweight transmission systems, to validate and demonstrate the applicability of the developed approaches in an industry context, on both powertrain tests rigs and new vehicles.

Project ID: [858018](#)

Improve public transport electrification to fight against climate change (eUltimate) - EIT urban mobility

Miquel ESTRADA (Universitat Politècnica de Catalunya, Barcelona TECH)

Abstract

Battery electric buses are being launched in many cities. Depending on the charging scheme chosen, different impacts on the operating costs, public space allocation and emissions are expected along the vehicle's lifetime. The aim of this project is to develop a decision support tool (DST) that designs the most suitable charging system for a city and estimates the number of resources needed by bus operators. The project is focused on the link between vehicle and charger, the cornerstone for their deployment in cities. Data related to the performance of battery electric buses will be gathered in 7 Hungarian cities, Badalona, Barcelona, Děčín, Lisbon and Milan. Datasets will be statistically analysed to characterize how vehicle technology and site-dependent conditions

affect the energy consumption of e-fleets in different situations. In a second step, the toolkit will also calculate the vehicles and chargers needed for the deployment of a specific technology as well as the total cost to be incurred by the transit operator. The toolkit will not only consider the current performance of technologies on the market, but drawing on the powertrains to be commercialized in the next years.

[EIT website](#)

bEyonD the boRder of electrIc VEhicles: an advanced inTeractive cOURse (E-DRIVE TOUR) – Erasmus

Theodoros KOSMANIS (International Hellenic University, Thessaloniki)

Abstract

The bEyonD the boRder of electrIc VEhicles: an advanced inTeractive cOURse (E-DRIVE TOUR) project aims to develop an advanced interactive course related to Sustainable Electrical Mobility Engineering that will train individuals with the necessary skills & knowledge to work in the electrical automotive industry. The course is also formulated to stimulate transversal competences such as the increased sense of initiative & entrepreneurship. It is designed to follow the European Credit Transfer & Accumulation System (ECTS) credit standards for certification recognition across the EU. The innovative curriculum comprises interactive teaching methods and partnerships with expert academic and industrial organizations in order to give to the students a solid background for starting a fruitful career in the industry. Through two educational mobility periods, hosted by the University partners, and a training one, performed in one of the industrial partners, the participating students will have gained significant theoretical knowledge on electric vehicle technology but most of all will have acquired significant practical experience, valuable for meeting the requirements of an emerging market.

[project website](#)

ORGANISING TEAM

The **MSCA Cluster Event on the European Green Deal** is jointly organised by the MSCA units of the [European Research Executive Agency](#), in close cooperation with the [Directorate-General for Education, Youth, Sport and Culture of the European Commission](#).

In the core organising team, we would like to mention the following colleagues:

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