

3rd World Conference on

ENVIRONMENTAL AND EARTH SCIENCES &

2nd World Conference on

RECYCLING AND WASTE MANAGEMENT

OCTOBER 23, 2023
LONDON, UNITED KINGDOM



Hosting Organization:

Eurasia Conferences, 124 City Road, London, EC1V 2NX.

(Virtual Session via Zoom)
London, UK (Time)

OCTOBER 23, 2023

Keynote Sessions

- 09:00-09:30** **Title: Spatiotemporal Variation, Chemical Fingerprints, and Transport Channels of Marine Fine Particles (PM 2.5) at Islands and Coasts in East Asia**
Chung-Shin Yuan, Institute of Environmental Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC
- 09:30-10:00** **Title: "Soft Caloric Liquid Crystal-Based Materials for New Heat-Management Technologies"**
Brigita Rožič, Condensed Matter Physics Department (F5), Jožef Stefan Institute, Ljubljana, Slovenia
- 10:00-10:30** **Title: Geospatial Estimation Processes Applied to Environmental Sciences: Identifying Best Spatial Interpolation Algorithm**
María de Lourdes Berríos-Cintrón, National University of Distance Education (UNED) PhD student, C. de Bravo Murillo, 38, Madrid 28015, Spain
- 10:30-11:00** **Title: Lithochemical Features of Shungite Rocks of Palaeoproterozoic Onega Structure**
Deines Yu. E., Institute of geology of Karelian Research Centre of Russian Academy of Sciences/Petrozavodsk, Russia

Tea and Refreshments Break 11:00-11:10

- 11:10-11:40** **Title: Pyrolysis of Waste Biomasses: A Sustainable Valorization Strategy for Olive Mill Solid Residues**
Lea Piscitelli, CIHEAM Bari, Via Ceglie, 9, 70010 Valenzano-Bari, Italy
- 11:40-12:10** **Title: Surface Water Pollution Due to Vehicle Washing Activities**
Dr. Reeta Rai, Department of STEM Education, Samtse College of Education, Royal University of Bhutan, Bhutan

Speaker Sessions

- 12:10-12:30** **Title: An Analysis of Skills Gaps and Prerequisites for the Sustainability Transformation**
Lydia Papadaki, Athens University of Economics and Business, Athens, Greece
- 12:30-12:50** **Title: Climate change in Oporto Metropolitan area – the city of Maia case study**
João Pedro Almeida Mendonça, Department of Renewable Energies, Universidade da Maia /Associate Professor, Maia, Porto, Portugal

Session Wrap

Keynote Sessions

Lunch Break 13:00- 14:00

- 14:00-14:30** **Title: A Detailed Study of Physicochemical Nutritional NPK Balance of The Bio Digested Compost and It's Suitability for Crop Growth And Yield**
Niranjan kumar, School of management studies, Cochin University of Science & Technology kalamassry kochi Kerela, India

- 14:30-15:00** **Title: Worldwide Climate and Justice Education Week 2024**
David E. Blockstein, Ph.D., Project Co-Director, Solve Climate by 2030, Graduate Programs in Sustainability, Bard College, Annandale-on-Hudson, NY, USA

- 15:00-15:30** **Title: Integrated Lean and Sustainability Framework**
Elizabeth A. Cudney, Ph.D., John E. Simon School of Business, Maryville University, St. Louis, MO, USA

Tea and Refreshments Break 15:30-15:45

- 15:45-16:15** **Title: Arctic Climate Change and Arctic Amplification**
Petr Chylek and Chris Folland, Earth and Environmental Sciences, Los Alamos National Laboratory, Los Alamos, New Mexico, USA
- 16:15-16:45** **Title: On the Concept of Cp Parameter and its Application in the Analysis of Scattering Phase Functions of Single Ice Crystal**
Guanglang Xu, Karlsruhe Institute of Technology, Karlsruhe, Germany

Poster Sessions

- Poster-1** **Title: Creating an Alternative Urban Food Reality: Collectivity as Urban Capital in Navigating Urban Farming Struggles of Greater Jakarta**
Sheila Maharani Berlian, University of Edinburgh, Edinburgh, Scotland, United Kingdom

Session Wrap and Conference Closing





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KEYNOTE PRESENTATIONS | DAY 1

ENVIRONMENTAL AND EARTH SCIENCES

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**Chung-Shin Yuan^{1,2}, Po-Hsuan Yen¹, Ker-Yea Soong³**¹Institute of Environmental Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC²Aeroaol Science Research Center, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC³Institute of Marine Biology, National Sun Yat-sen University, Kaohsiung, Taiwan, ROC

Spatiotemporal Variation, Chemical Fingerprints, and Transport Channels of Marine Fine Particles (PM_{2.5}) at Islands and Coasts in East Asia

Rapid economic and urban developments in East Asia cause it one of the three PM_{2.5} polluted regions in the world. This study aims to explore the spatiotemporal variation of PM_{2.5} in East Asia and characterized its chemical fingerprints and source origins. We summarized the mass concentrations and chemical composition of marine PM_{2.5} at Cheju Island, Tonji Island, Xiamen Island, Kinmen Island, Matsu Islands, Penghu Islands, Green Island, San Diego Cape, Hengchun Peninsula, Dongsha Islands, and Nansha Islands. It showed that the spatial distribution of PM_{2.5} concentrations in East Asia were ordered as: North>South and West>East, while the seasonal variation were ordered as: winter>spring>fall >summer. Secondary inorganic aerosols (SIAs) were the dominant component of water-soluble ions (WSIs) in PM_{2.5}. Crustal elements dominated the metallic contents in PM_{2.5}. High EF values (>10) showed that trace metals were potentially contributed from anthropogenic sources. Moreover, organic carbon (OC) was superior to elemental carbon (EC) in PM_{2.5}, showing the formation of secondary organic aerosols (SOAs) in winter and spring. Three major channels were clustered for air masses transported toward South China Sea (SCS). The most polluted air masses blown from the North and East China during the Northeastern Asian Monsoons in spring and winter is known as West Channel, while the cleanest air masses blown from southern SCS in summer is known as South Channel. Another is East Channel where air masses were blown from northeastern China, Korea Peninsula, and Japan Islands, which had the PM_{2.5} concentrations in the between of West and South Channels.

Keywords: East Asia, Marine PM_{2.5}, Spatiotemporal variation, Chemical fingerprints, Clustered transport channels

Biography:

Dr. Chung-shin Yuan is the Chair Professor and the Director of Institute of Environmental Engineering at National Sun Yat-sen University in Taiwan. He has received his Doctoral Degree of Environmental Engineering from UIUC. As a well-known scholar of air quality monitoring and air pollution control technology, he has served as the President of Taiwan Association for Aerosol Research (TAAR), the Associate Editors of JA&WMA and AAQR. His professional reputation is recognized by many awards for his excellent academic achievements. He has authored more than 210 peer-reviewed Journal papers, delivered 806 conference presentations, published 14 books/book chapters, and owned 20 patents.

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**Brigita Rožic¹ and Zdravko Kutnjak¹, Boštjan Zalar¹,
Gregor Skacej², Samo Kralj³**

¹Condensed Matter Physics Department (F5), Jožef Stefan Institute, Ljubljana, Slovenia,

²Department of Physics, FMF, University of Ljubljana, Slovenia

³Department of Physics, FNM, University of Maribor, Slovenia

Soft caloric liquid crystal-based materials for new heat-management technologies

With increased environmental awareness, the search for an environmentally friendlier heat-management device has been the topic of many scientific studies. Materials with large caloric effects, such as the electrocaloric (EC) and elastocaloric (eC) effects, have the promise of realizing new solid-state refrigeration techniques. A review of recent direct measurements of the large EC effect in liquid crystals (LCs) and large eC effect in liquid crystal elastomers (LCEs) [1,2] will be given in this contribution, including the application aspect. In particular, in smectic LCs and mixtures of LCs with functionalized nanoparticles, the EC effect exceeds 8 K and the eC in main-chain (MC) LCEs exceeds 2K. However, both soft materials can play a significant role as active cooling elements and parts of thermal diodes or regeneration material in developing new cooling devices. [1] M. Lavric et al, Liq. Cryst. 48:405-411, 2021. [2] A. Rešetic et al, Nat Comm 7:13140,2016.

Biography:

Assist. Prof. Dr. Brigita Rožic obtained a Ph.D. degree in physics in 2012 at the Jozef Stefan International Postgraduate School, Ljubljana. After two years of postdoctoral work at Institut des Nano-Sciences de Paris (INSP), Pierre and Marie Curie Université Paris, France, Dr. Rožic returned to Jozef Stefan Institute. As a research associate, she works in the laboratory for calorimetry and dielectric spectroscopy, and she is an Assistant Professor at the Jozef Stefan International Postgraduate School. She continues the soft matter research, including multicalorics, multiferroics, magnetoelectrics, plasmonic systems, liquid crystal elastomers, and topological defects.

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María de Lourdes Berríos-Cintrón¹ and David Galán-Madruga²

¹National University of Distance Education (UNED) PhD student, C. de Bravo Murillo, 38, Madrid 28015, Spain

²National Reference Laboratory of Air Quality. National Centre for Environmental Health (CNSA). Carlos III Health Institute (ISCIII), Ctra. Majadahonda a Pozuelo, Madrid 28222, Spain

Geospatial estimation processes applied to environmental sciences: Identifying best spatial interpolation algorithm.

The aim of this study is to assess and identify the most suitable geospatial interpolation algorithm for environmental sciences. The research focuses on evaluating six different interpolation methods using annual average PM10 concentrations as a case study. The original dataset includes measurements obtained from a target air quality network (scenery 1) and a sub-dataset derived from applying partitive clustering techniques (scenery 2). Both sceneries are compared to achieve the proposed objective. The reached findings reveal that the kriging interpolation method sustains the highest performance within environmental sciences, with a spatial similarity of approximately 70% between the two sceneries. The performance indicators for the kriging method, including RMSE (root mean square error), MAE (mean absolute error), and MAPE (mean absolute percentage error) are measured at 3.2 µg/m³, 10.2 µg/m³, and 7.3%, respectively. This study addresses the existing gap in scientific knowledge regarding the comparison of geospatial interpolation techniques. The obtained outcomes provide valuable insights for environmental managers and decision-makers, enabling them to implement effective control and mitigation strategies based on reliable geospatial information and data. In summary, this research evaluates and identifies the most suitable geospatial interpolation algorithm for environmental sciences, with the kriging method emerging as the most reliable option. The study's findings contribute to the advancement of knowledge in the field and offer practical implications for environmental management and planning.

Biography:

María Berríos Cintrón is a PhD student at the National University of Distance Education in Madrid, Spain. Her study program is Biomedical Sciences and Public Health. Also, she is an Assistant Professor at the Inter-American University of Puerto Rico, Barranquitas Campus. She has held this position from 2010 to the present. Maria holds a master's degree in Advances in Radiology and Physical Medicine and a Bachelor's degree in Biology. In the master's degree, she had the opportunity to research in the line of molecular oncology and at the undergraduate level she gave different presentations on phytoremediation in Puerto Rico.

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**Deines Yu. E**Institute of geology of Karelian Research Centre of Russian Academy of Sciences/
Petrozavodsk, Russia

Lithochemical Features of Shungite Rocks of Palaeoproterozoic Onega Structure

Onega basin, Russian Fennoscandia, is stratotipical for shungite rocks of Precambrian. The c. 2000 Ma, 900-m-thick, Zaonega Formation in the Onega basin, contains one of the greatest accumulations of organic matter (OM) in the Palaeoproterozoic during the period known as worldwide Shunga Event. Zaonega Formation rocks are greenschist-facies volcanoclastic greywackes, dolostones, limestones, shungite-bearing rocks, mafic tuffs and lavas intruded by numerous mafic sills. Several sedimentary beds are enriched in OM with the overall content of total organic carbon (TOC) ranging from 0.1 to 16 wt.%. The maksovite and shungite are most rich in TOC (15 to 45 and 45 to 80 wt.%, respectively) and consists of SiO₂, Al₂O₃, S, and minor K, Mg, Fe, Ca and Ti. The shungite rocks occur in nine stratigraphic levels in the form of stratified beds and dome-like bodies. An attempt was made to identify some of the main lithochemical features of shungite rocks of different stratigraphic levels, as well as within the same level and within the dome. The chemical composition of shungite rocks was calculated on the basis without TOC, and the rock classification of Yudovich and Ketris was used to classify shungite rocks without TOC. Shungite rocks were separated for five groups by content of mineral component, namely, supersilites, normosilites, miosilites, gypersilites and siallites. The use of petrochemical modules makes it possible to identify the belonging of shungite rocks to one or another stratigraphic level. And consequently, to carry out the correlation of well sections of different sections of the Onega structure.

Biography:

Researcher at the Laboratory of Geology and Technology of Shungite Rocks. For more than 20 years I have been studying Palaeoproterozoic shungite rocks. I study the genesis of shungite rocks, as well as search for and explore new dome and sublayer deposits of shungite rocks.

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**Lea Piscitelli¹, Daniel P. Rasse², Anna Daniela Malerba³,
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⁴Department of Soil, Plant and Food Sciences, University of Bari Aldo Moro, Via Amendola 165/a, 70126, Bari, Italy

Pyrolysis of waste biomasses: a sustainable valorization strategy for olive mill solid residues

Olive oil-industry generates great quantity of residues with significant concern for productive sector and for environmental and economic implications. Pyrolysis is a carbon-negative thermochemical process of energy production that produces biochar. This study aims to investigate the pyrolytic conversion of olive mill solid residues (OMSR) into biochar, to demonstrate its potentiality for agriculture and for mitigating C-emissions, as agent of social-economic development and as tool for achieving Sustainable Development Goals.

The parameters of the pyrolysis process and the physico-chemical characteristics of OMSR-biochar (OB) were analyzed and compared with data available in literature for investigating its uses as soil amendment and its contribution in carbon sequestration.

Indeed, the so produced OB showed high carbon content and abundant surface functional groups capable of retaining cations and selected plant nutrients. This biochar shows peculiar physico-chemical characteristics: wide specific porosity and volatile matter content that affect positively soil aeration and water retention while exerting positive effects on soil microbial community. The pool of these characteristics together make OB a valid soil-improver and a valuable tool for reducing carbon emissions in the atmosphere. The production of biochar itself matches with several Sustainable Development Goals as depicted in the fundamental Agenda 2030 and can contribute significantly to a closed-loop economic cycle. While the conversion of OMSR into biochar participate directly to farm circular economy and can trigger green-business model by removing a potentially harmful waste biomass whose alternative use are less environmentally and economically sustainable and with minor agricultural advantages.

Biography:

Lea Piscitelli hold a PhD in Agricultural Chemistry defended in 2016 at University of Bari with a thesis on the agricultural and environmental effects of biochar. During the PhD period and in her career she obtained some awards and published in valuable journals. Currently she works at CIHEAM Bari on the valorization of waste biomasses for agricultural purposes and is involved in several field experimental activities. She is responsible of the Unit "soil management and fertility" in the Mediterranean Organic Agriculture Master course. Now, her research interests focus on the efficient exploitation of waste biomasses for the environmentally sustainable food-production.

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Dr. Reeta Rai

Department of STEM Education, Samtse College of Education, Royal University of Bhutan, Bhutan

Surface Water Pollution Due to Vehicle Washing Activities

Wastewater generation is one of the biggest challenges associated with increasing economic activities, urbanization, and population. Globally, over 80% of wastewater is released into the environment without adequate treatment. Disposal of wastewater into the inland water resources leads to deteriorations in water quality and quantity that impact not only the aquatic ecosystem but also the availability of safe water for human consumption. Natural water bodies are made the endpoints of wastewater from point and non-point sources, causing environmental and public health hazards largely in developing countries. Within the Hindu Kush Himalayan (HKH) countries, a large proportion of wastewater is discharged directly into the closest surface water bodies or informal drainage channels, sometimes without or with very little treatment. Among the different types of wastewater, vehicle wash wastewater has been identified as a potential source of pollution either as surface runoff or inappropriate discharge. Vehicle washing is a highly water-consuming process that involves the use of chemicals and generates potentially toxic wastewater containing a wide range of pollutants such as petroleum hydrocarbon wastes, nutrients, surfactants, mud, sand, organic matter, and heavy metals. Disposal of such contaminated wastewater into surface water bodies can adversely affect water quality, aquatic habitat, and biotic communities such as benthic macroinvertebrates and fish. Vehicle wash wastewater should be treated by constructing simple cost-effective treatment plants and the pollutant levels monitored before disposing of the surface water bodies and the environment or for reuse. Reusing treated vehicle wash wastewater is important for protecting the environment and effective utilization of water resources.

Keywords: Bhutan, Wastewater, vehicle wash wastewater, surface water, water quality, and macroinvertebrates.

Biography:

Dr. Reeta Rai is a faculty member at the Samtse College of Education, Royal University of Bhutan. She has a Ph.D. in Environmental Science and a M.Sc. in Chemistry. She teaches Chemistry, Environmental Science, and teaching methods and supervises M.Ed. Chemistry students' dissertations. She is also the country coordinator for the IDRC-funded project "Connected Learning for Teacher Capacity Building in STEM" (CL4STEM). She has authored book chapters, published international peer-reviewed journal articles, and given conference presentations in the fields of environmental science, teacher education, and STEM education.

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Niranjan kumar¹

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A detailed study of physicochemical nutritional NPK balance of the bio digested compost and it's suitability for crop growth and yield

A controlled experiment were carried out in the terms of determining the NPK value of earthworm digested solid waste and the waste generated from the kitchen and the fruit and vegetable W. During experiment the species for the biodigestion belongs to the class annelids eudrilus eugene and eiseine foetide which is commonly available naturally in the genetically intact form in these tropical climatic region of Bihar. The experimental digestion and production of the cast and its physico-chemical analysis using Kjeldahl methods and Spectrophotometric measurement shows that the N;P;K value in the compost cast were 0.57%; 0.0046% & 0.12 % respectively and the f-test value were 5.87E-15. The PH of the worm cast ranges 6.2-6.9 and the TSS were 1.3-1.8 C.G. The over all waste management issue were studied in details and the crop yeild feasibility and impact and suitability were inquired in depth in terms of sustainable resource management and found that it is a more sought natural ways of managing resources of nutrients in developing and developed city as well. The application suitability is best at small scale for maintaining long term soil health of the field and the plant growth is well nourished yeild was satisfactorily high and more economical in processing as it is natural feed prey relationship in term of ecology because the species are indeginious and well reared.

Keywords: earthworms; NPK; resource;sustainability;spectrophotometer;Kjeldahl;solid waste

Biography:

A researcher beyond imagination doctrate in science pioneered many researches and authored several research manuscripts in international journals. And chaired several meetings and conferences as distinguished and keynote speaker. Contributed several patents. Founded Kumar international R&D consultant startup company.

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**David E. Blockstein**

Ph.D., Project Co-Director, Solve Climate by 2030, Graduate Programs in Sustainability, Bard College, Annandale-on-Hudson, NY, USA

Worldwide Climate and Justice Education Week 2024

The Worldwide Climate and Justice Education Week (April 1-8, 2024) is a coordinated global educational event that engages hundreds of institutions and tens of thousands of people in interdisciplinary learning (and action) on climate and justice. Worldwide Climate and Justice Education Week is designed to cultivate interdisciplinary learning and action on matters of climate and justice. This event aims to unite thousands of institutions and tens of thousands of people in a shared commitment to creating a more equitable and sustainable world. Our goal is to help youth move from climate despair to climate repair. Participating schools, colleges and universities, organizations and communities determine how they will participate in MakeClimateAClass and MakeClimateAnEvent by organizing an educational event regarding climate change, solutions or justice. From 2020-2024 more than 800 events reached over 100,000 people in more than 70 countries. These locally-created and organized activities have included:

- Panels and discussion
- Community Speakers
- Film
- Performances - plays, comedy, music
- Exhibitions and Art Installations
- Games

Educators can MakeClimateAClass by spending at least 30 minutes discussing connections between their subject and climate change, solutions or justice. SubjectToClimate provides lesson plans, curricula, and teacher guides organized by grade level and subject. Bard College, EarthDay.org, SubjectToClimate, National Wildlife Federation, the Open Society University Network and other partners invite you to participate in Worldwide Climate and Justice Education Week during the first week of April 2024. It is a great way to begin Earth Month! For more information, contact SolveClimate2030@gmail.com or www.wwti.org

Biography:

David Blockstein PhD is an ecologist and conservation biologist with more than 35 years of national leadership at the interface of science and environmental policy. He co-directs Solve Climate by 2030 for Bard College. He co-founded and led the US National Council for Science and the Environment (1990), the Council of Environmental Deans and Directors, Council of Energy Research and Education Leaders, US Partnership for Education for Sustainable Development and the Association for Environmental Studies and Sciences. Dr. Blockstein co-authored The Climate Solutions Consensus: What We Know and What to Do About It (2010). He is an elected AAAS Fellow.

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Elizabeth A. Cudney, Ph.D.

John E. Simon School of Business, Maryville University, St. Louis, MO, USA

Integrated Lean and Sustainability Framework

While organizations may desire to improve their impact on the environment; however, they lack a methodology for integrating Sustainability into their continuous improvement efforts. Lean is a concept to generate a continuous improvement system and eliminate waste throughout the organization from production to the supply chain, which improves quality, reduces costs, and adds value for customers. Lean focuses on increasing output with optimized usage of input resources by reducing waste and increasing process efficiency. Sustainable Green strategies focus on eliminating environmental wastes related to water, energy, air, and solid and hazardous waste. Lean and Green paradigms have a commonality in the context of waste reduction, continuous improvement, efficiency-driven improvement, and emphasis on cleaner production. This presentation will provide an integrated Lean Green Sustainability Framework. This framework includes Lean and Green Sustainability principles, tools, and methodologies from the quality improvement Plan-Do-Check-Act phases integrated with the circular economy 5 Rs of refuse, reflect, reduce, reuse, and recycle. The framework provides a simple yet powerful way to navigate Lean improvements that support Sustainability.

Biography:

Dr. Elizabeth Cudney is a Professor of Data Analytics in the John E. Simon School of Business at Maryville University. She received her B.S. in Industrial Engineering from North Carolina State University, Master of Engineering in Mechanical Engineering and MBA from the University of Hartford, and doctorate in Engineering Management from the University of Missouri – Rolla. She is a recipient of the ASQ Crosby Medal, IAQ Masing Book Prize, IAQ Yoshio Kondo Academic Research Prize, and ASQ A.V. Feigenbaum Medal. She is an ASQ Fellow, IISE Fellow, ASEM Fellow, and Academician in the International Academy for Quality.

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**Petr Chylek¹ and Chris Folland^{2,3,4}**¹Earth and Environmental Sciences, Los Alamos National Laboratory, Los Alamos, New Mexico, USA²School of Environmental Sciences, University of East Anglia, Norwich, UK³Department of Earth Sciences, University of Gothenburg, Gothenburg, Sweden⁴Centre for Applied Climate Sciences, University of Southern Queensland, Toowoomba Australia

Arctic Climate Change and Arctic Amplification

The Arctic is known to warm faster than the globe as a whole. The Arctic warming affects climate in many parts of the globe. The Arctic Amplification (AA), defined as a ratio of the Arctic temperature trend to global temperature trend, has been used as an indicator of this faster than average Arctic warming. During the 20th century the AA was between two and three in agreement with climate models projections. However, during the early years of the 21st century the AA reached values over four. The latest versions of climate models, members of the CMIP6 (Coupled Models Intercomparison Project phase 6) collection, have difficulty to reproduce these high AA values. One might expect that a reason for this difficulty is models' underestimate of Arctic warming. However, this is not so. The main reason for models' inability to reproduce the observed high AA values is the models' overestimation of the trend of the global warming after 1990s. Using this new insight, we project future AA value till 2050 to be around 3.5. Models are usually tuned so that the models' global temperature agrees with observation. However, a small error in temperature can cause a large error in temperature trend and in the AA. We suggest that the future tuning should include not only the mean global temperature but also the trend of the mean global temperature.

Biography:

Petr Chylek is a theoretical physicist. He was a professor of physics and atmospheric science at several US and Canadian universities. Since 2001 he has been working in the Earth and Environmental Sciences Division at the Los Alamos National Laboratory in Los Alamos, New Mexico in the field of remote sensing, climate, and environmental sciences. He is an author and co-authors of over 150 publications in scientific journals. His current major research interests are the US Southwest, and Arctic climate and climate change.

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Guanglang Xu¹, Martin Schnaiter¹, Shawn Wagner¹ and Emma Järvinen¹

¹Karlsruhe Institute of Technology, Karlsruhe, Germany

On the concept of C_p parameter and its application in the analysis of scattering phase functions of single ice crystal

Real physical world is complex. Improving our understanding of the real physical world can only be achieved through joint efforts of measurement and modeling. Measurement obtains direct input data from the real physical world, and modeling produces output based on our conceptual understanding of the physical world. In this talk, I will introduce a new mathematical concept called C_p parameter using simple Legendre polynomial expansion. I will explain why this concept is important and how it can be used in connecting the measurement and modeling. To illustrate the effectiveness of this parameter in analyzing measurement and modeling data, particularly, I will discuss the so-called C_p -analysis on the scattering phase function of single ice crystal. I will discuss how valuable information about the morphologies of the ice crystal can be retrieved through the relation between the C_p parameter and the asymmetry parameter g under the framework of successive order of scattering.

Biography:

Dr. Guanglang Xu has been a postdoctoral researcher at Karlsruhe Institute of Technology since the beginning of 2021. He obtained his Ph.D degree in atmospheric sciences at Texas A&M University in December of 2017. Starting from February of 2018, he spent more than two years as a postdoc researcher at the department of physics, University of Helsinki, Finland. Dr. Xu's research focuses on light scattering by non-spherical particles using both numerical and measurement approaches.



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SPEAKER PRESENTATIONS | DAY 1

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An analysis of skills gaps and prerequisites for the Sustainability Transformation

**Lydia Papadaki¹, Ebum Akinsete², Phoebe Koundouri³, Angelina Taneva-Veshoska⁴,
Slavica Trajkovska⁵ and Ana Tomikj⁶**

¹Athens University of Economics and Business, Athens, Greece

²Sustainable Development Unit, ATHENA Research and Innovation Centre, Marousi, Greece

³Athens University of Economics and Business, Athena Research Centre, Danish Technical University, SDSN Europe, Athens, Greece

⁴Institute for Research in Environment, Civil Engineering and Energy, Skopje, North Macedonia

⁵Institute for Research in Environment, Civil Engineering and Energy, Skopje, North Macedonia

⁶Institute for Research in Environment, Civil Engineering and Energy, Skopje, North Macedonia

New vocational education and training (VET) skills are needed to make European economies and societies more sustainable, resilient, and ready for green and digital changes. This study is part of the CATALYST project "European VET Excellence Centre for Leading Sustainable Systems and Business Transformation" to support the new industrial and SME policies and the European Green Deal. Our study is comprised of an online survey and local language interviews in Austria, Germany, Greece, North Macedonia, and Portugal. 504 professionals and SME representatives filled in the survey, 64 of whom were interviewed 1:1. The research aims to better understand corporate sustainability and governance practices and identify market skills gaps. We also organized 6 Roundtables in all five countries from November to December 2022 bringing together businesses, educational institutions, public bodies, and civil society organisations to discuss challenges and opportunities related to the transition to more sustainable practises, validating the study's findings. The national roundtables discussed policies, regulations, tactics, business, and skill education. Businesses struggled to implement sustainable practises due to financial constraints, a lack of human resources, change aversion, and regulatory conformity.

Management and analysis skills, problem-solving talents, and sustainability concerns including legislation were indicated as key development topics. Survey and roundtables recommendations included upskilling staff, encouraging collaboration amongst varied industries, implementing regulations to foster cooperation, and training to raise sustainability awareness. The CATALYST project's future courses aim to address these challenges by shifting attitudes towards sustainability, using real-world examples, and showing the benefits of sustainable practices.

Biography:

Lydia Papadaki is a PhD candidate at the Athens University of Economics and Business (Scholarship awarded by the Academy of Athens). She is a researcher at the Alliance of Excellence for Research and Innovation on Aephoria (AE4RIA) (<https://ae4ria.org>) participating in several EU-funded projects. She received her M.Sc. in Economics and policy of Energy and the Environment at University College London (UCL), and her BSc (Distinction) in Economic theory and policy at Athens University of Economics and Business (AUEB). Her main areas of interest are economics, innovation acceleration, behavioural economics, circular economy, blue growth, systems innovation, stakeholders engagement and sustainable development.

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Climate change in Oporto Metropolitan area – the city of Maia case study

João Pedro Almeida Mendonça

Department of Renewable Energies, Universidade da Maia /Associate Professor, Maia, Porto, Portugal

There's no subject more discussed in the actual society than the climate's change theme. From activists, scientists, academics, politics, or the public in general, there is a wide range of opinions about it; assuming sceptic views of the human role in the process, till the ones who consider the human and the natural causes, both related to it, the conceptions are very diverse. Although this controversy, in the scientific world the most frequent opinion points out the anthropogenic factor as the most important to the changes operating nowadays, and the urban areas are one of the most severely affected and at the same time more responsible for that.

This presentation is related to one study case – Maia - in the Oporto's metropolitan area in the north of Portugal. A methodology for data collection is provided and discussed both main causes and intervention measures to minimise the urban heat island processes. The geographical perspectives for urban intervention and planning are the other main aspects to suggest and demonstrate.

Biography:

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GRAÇA, M; CRUZ, S.; MONTEIRO, A.; NESET, T-S. Designing urban green spaces for climate adaptation: A critical review of research outputs. Urban Climate 2022. <https://doi.org/10.1016/j.uclim.2022.101126>

KOONIN, S. (2022) A Ciência do Clima: o que a Ciência nos Diz, o que Não Diz e o que Isso Interessa, Lisboa, Guerra e Paz Ed.

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ENVIRONMENTAL AND EARTH SCIENCES

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Creating an Alternative Urban Food Reality: Collectivity as urban capital in navigating urban farming struggles of Greater Jakarta

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Rapid urbanisation in Greater Jakarta has resulted in the increase of food insecurity. Urban farm collectives respond to said urban reality by attempting to build food self-sufficiency through their farming practices. However, Greater Jakarta as an urban space presents many struggles that have to be faced by the urban farm collectives. Using the emerging theory of urban capital, this qualitative research explores the way urban farming collectives navigate struggles through the possession (or lack thereof) of urban capital in Greater Jakarta. Through online in-depth interview with three urban farm collective founders, it is analysed that forms of urban capital such as social networks and higher education could help in eliminating initial struggles of creating an urban farm in Greater Jakarta. However, said capital(s) are not enough to sustain an urban farm collective in the city. It is then argued that collectivity serves as the urban capital necessary for urban farm collectives to navigate struggles and create an alternative urban food reality of Greater Jakarta. This research also suggests that collectivity has become a culture of Greater Jakarta that is threatened into decline by urbanisation, by which the urban farm collectives are trying to actively bring back into the city through their practices.

Biography:

Sheila is a MSc candidate for Environment, Culture and Society Master's degree program at The University of Edinburgh. Her experiences as a media researcher for Low Carbon Development in Indonesia (LCDI), as well as a communication consultant for Greenpeace Southeast Asia, led her to explore communication/media research, environmental social sciences research, and the combination of the two. She aspires to pursue further researches in the interdisciplinary field of environmental communication and media studies, with a hint of urban studies on top.



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