



Pan-Eurasian Experiment

PEEX



UNIVERSITY OF HELSINKI

INAR

INSTITUTE FOR ATMOSPHERIC AND
EARTH SYSTEM RESEARCH

BOOK-OF-ABSTRACTS

PEEX-e-Conference

a series of PEEEX online seminars

April 2026

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**PEEX-e-Conference – a series of PEEX online seminars (1, 9, 14 April 2026)
&
Plenary Talk by Academician Markku Kulmala (15 April 2026)**

Organisers

Dr. Hanna K. Lappalainen, hanna.k.lappalainen(at)helsinki.fi
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Prof. Tuukka Petäjä, tuukka.petaja(at)helsinki.fi
Academician Markku Kulmala, markku.kulmala(at)helsinki.fi

Main aims

- (1) to share results of research and educational activities at PEEX partner universities/ organizations
- (2) to discuss future collaboration in a frame of climate change, air quality and environmental research as well as research infrastructures
- (3) to discuss PEEX COST Action proposal improvements
- (4) [ACP special issue](#)

See presentations linked at webpage: <https://www.atm.helsinki.fi/peex/index.php/portfolio-items/peex-e-conferencek-april-2026>

1st online PEEX seminar - Introduction of newly joined Partners/Organizations

chaired by Hanna K. Lappalainen, Alexander Mahura

Date: 1 April 2026, Wednesday

Time: 10:50 am – 15:30 pm of Helsinki time (09:50 am – 14:30 pm of CET time)

See Annex 1 with detailed agenda for 1 April 2026

- **P01** – Welcome and Short Introductory to PEEX – by *Hanna K. Lappalainen, University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR)*
- **P02** – Institute of Ionosphere research and educational activities – by *Alena Yelisseeva & Tatiana Dedova, Institute of Ionosphere, Kazakhstan Academy of Sciences (IoI KAS), Kazakhstan*
- **P03** – Research and educational activities at the Department of Atmospheric Physics at CUNI – by *Tomas Halenka, Charles University in Prague (CUNI), Czech Republic*
- **P04** – Urban Climate Risks in Northern Cities: Research and Educational Activities at NERSC – by *Victoria Miles, Nansen Environmental and Remote Sensing Center (NERSC), Norway*
- **P05** – Research and Education in the field of Earth and Environmental Sciences at the O.M. Beketov National University of Urban Economy in Kharkiv, Ukraine – by *Yuri Vergeles, O.M. Beketov National University of Urban Economy in Kharkiv (BNUUEK), Ukraine*
- **P06** – Complexity Science Meets Earth System – by *Jingfang Fan, School of Systems Science, Beijing Normal University University (BNU), China*
- **P07** – On Recent Advancements in Atmospheric and Air Quality Monitoring – by *Tuukka Petaja, University of Helsinki, Institute for Atmospheric and Earth System Research (UH-INAR), Finland*

- **P08** – On the gap of science policy for air quality: Environmental Geochemistry and Atmospheric Research, IDAEA-CSIC – *by Xavier Querol, Spanish National Research Council (CSIC), Spain*
- **P09** – Towards interactive carbon cycle in ICON Earth System Model – *by Georgii Nerobelov, Max-Planck Institute for Biogeochemistry (MPI-BioGeoChem), Germany*
- **P10** – Research and knowledge transfer activities at FiBL – *by Tetiana Grabovska, Research Institute of Organic Agriculture (FiBL), Switzerland*
- **P11** – Synthesis of the Horizon Projects implemented at MeteoRomania – *by Sorin Cheval, National Meteorological Administration (NMA-Romania), Romania*
- **P12** – Mission and projects of the Climate, Atmosphere and Water Research Institute at Bulgarian Academy of Sciences – *by Ekaterina Batchvarova, Climate, Atmosphere and Water Research Institute - Bulgarian Academy of Sciences (CAWRI-BAS), Bulgaria*
- **P13** – What is going on in applied mathematics in Saarland? – *by Andreas Rupp, Saarland University (UdS), Germany*
- **P14** – Air Quality Modelling at AUTH/SEL – *by George Tsegas, Aristotle University of Thessaloniki (AUTH), Greece*
- **Discussions & Wrap-up**

2nd online PEEEX seminar - Invited Talks from PEEEX Partners/ Organizations

chaired by Alexander Baklanov, Tareq Hussein

Date: 9 April 2026, Thursday

Time: 10:50 am – 17:00 pm of Helsinki time (09:50 am – 16:00 pm of CET time)

See Annex 2 with detailed agenda for 9 April 2026.

- **P01** - Welcome and Short Introductory to PEEEX – *by Hanna K. Lappalainen, University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR)*
- **T01** – Integrated systems and analysis of urban Mobility for climate-neutral, environmentally friendly, and sustainable Cities in Europe and China (IMTECC) – *by Alexander Baklanov, University of Copenhagen, Niels Bohr Institute (UCPH-NBI), Denmark*
- **T02** – Scenario-Based and Climate-Adjusted Projections of PM_{2.5} and SO₂ to 2050: Chemical Transport Modelling Evidence from Western Kazakhstan – *by Vitaliy Salnikov, Al-Farabi Kazakh National University (KazNU), Kazakhstan*
- **T03** – Meteorological and climatic research at Taras Shevchenko National University of Kyiv – *by Olga Schevchenko, Taras Shevchenko National University of Kyiv (TSNUK), Ukraine*
- **T04** – Renewable energy - Integrated master program at the Arctic University of Norway – *by Igor Ezau, The Arctic University of Norway (UiT), Norway*
- **T05** – Simulating aerosols in cold regions withing EC-Earth – *by Risto Makkonen, Finnish Meteorological Institute (FMI), Finland*
- **T06** – Seamless modeling studies of aerosol-meteorology interactions at the Ukrainian Hydrometeorological Institute – *by Mykhailo Savenets, Ukrainian Hydrometeorological Institute (UHMI), Ukraine*
- **T07** – Forest data science and IoT in the times of AI - paradigm shifts in research and education – *by Steffen Manfred Noe, Estonian University of Life Sciences (EULS), Estonia*
- **T08** – Integrating Climate Education in Agricultural Curricula: Institutional Mission and Capacity Building – *by Tetyana Dyman, Bila Tserkva National Agrarian University (BTNAU), Ukraine*

- **T09** – How climate change affects Intangible Heritage: The case of Catalan human towers – *by Jon Xavier Olano Pozo, Universitat Rovira i Virgili (URV), Spain*
- **T10** – Air quality monitoring using low-cost sensors network in Amman city in Jordan – *by Khaled Hazaymeh, Yarmouk University (YU), Jordan*
- **T11** – IDSSD DSP: Digital Sustainable Development Goals Programme – *by Yubao Qiu, International Research Center of Big Data for Sustainable Development Goals (CBAS), China*
- **T12** – Mechanism and Technology Application of Non-Uniform Environment Creation in Large Public Buildings – *by Yu Zhao, Dalian University of Technology (DLUT), China*
- **T13** – International Collaboration: AISUS+ Initiative: AI-Empowered Climate and AQ System for Urban Sustainability and Climate Resilience – *by Xu Tang, Fudan University (FDU), China*
- **T14** – PM₁₀ Concentrations in Istanbul: A Comparative Analysis of 2024 and 2025 – *by Huseyin Toros, Istanbul Technical University (ITU), Türkiye*
- **T15** – Fast-track futures: bridging education and work – *by Anda Paegle & Inga Skendere, Latvia University (LU), Latvia*
- **T16** – Persistent Low-Water Phase of Major Ukrainian Rivers Flowing into the Northwestern Black Sea under Ongoing Climate Change – *by Valeriya Ovcharuk, Mechnikov Odessa National University (ONU), Ukraine*
- **T17** – Beyond Individual Projects: Odesa Polytechnic National University as a Hub for the Development of Transdisciplinary R&D Clusters – *by Oleh Shablii, Odesa Polytechnic National University (OP), Ukraine*
- **T18** – Regional scale modelling for Europe: towards climate and air quality modelling convergence – *by Sandro Finardi, ARIANET Srl, Italy*
- **T19** – High Latitude Dust research: from observations to impacts on climate and society – *by Pavla Dagsson-Waldhauserova, Agricultural Univ of Iceland (AUI), Iceland*
- **T20** – Development and application of atmospheric transport models for assessing radioactively contaminated sites: experience of IMMSP – *by Ivan Kovalets, Institute of Mathematical Machines and Systems Problems (IMMSP), Ukraine*
- **Discussions & Wrap-up**

3rd online PEEEX seminar co-organized with TWAS at the ACCC Impact Week 2026

chaired by Markku Kulmala, Hanna K. Lappalainen, Alexander Mahura

Date: 14 April 2026, Tuesday

Time: 10:30-12:00 & 13:00-14:00 of Helsinki time

See Annex 3 with detailed agenda for 14 April 2026.

- **PR1**– Welcome words, Grand Challenges – *by Markku Kulmala, University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*
- **PR2** – Building Scientific Capacity in the Global South for Climate Justice – *by Max Paoli, The World Academy of Science (TWAS), UNESCO*
- **PR3** – Eye on Methane: From Measurement to Momentum – *by Xuefei Li, UNEP's International Methane Emissions Observatory*
- **PR4** – Summary of recently completed RI-URBANS project on observational/ measurement activities – *by Xavier Querol, Spanish National Research Council (CSIC), Barcelona, Spain*
- **PR5** – Summary of recently completed CRiceS project on modelling activities – *by Risto Makkonen, Finnish Meteorological Institute (FMI), Helsinki, Finland*

- **PR6** – Summary of ongoing FOCI project – *by Tomas Halenka, Charles University (CUNI), Prague, Czech Republic*
- **PR7** – Overview on recent research at Fudan University for the PEEEX domain – *by Bo Yao, Department of Atmospheric and Oceanic Sciences, Fudan University, Shanghai, China*
- **PR8a** – Educational activities in Erasmus+ CLUVEX/ UnaVEx/ ClimEd projects – virtual exchanges/ trainings for Climate Messengers, Climate Advocates, Climate Experts – *by Alexander Mahura, University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*
- **PR8a** – ClimEd - Building capacity for climate services in Ukraine – *Svyatoslav Tyuryakov, University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*
- **PR9** – COST Action PEEEX-EU-NEN-ReN “Pan-Eurasian EXperiment – Europe – Near Europe Neighbourhood countries Earth System Research Network” – *by Hanna K. Lappalainen & Alexander Mahura, University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*
- **Wrap-up & Discussions on the PEEEX COST Action proposal & Next Steps**

Plenary Talk by Academician Markku Kulmala at the ACCC Impact Week

Date: 15 April 2026, Wednesday

Time: 09:00-10:10 of Helsinki time

- Global environmental grand challenges (EGCs) and the need of comprehensive open data with proper metadata and open science to meet the EGCs – *by Markku Kulmala, University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*

See Annex 4 with list of participants attended a series of e-seminars on 1, 9, and 14 April 2026

ABSTRACTS OF PRESENTATIONS

ABSTRACTS OF PRESENTATIONS DELIVERED on 1ST APRIL 2026

P01: SHORT INTRODUCTORY TO PEEEX

Hanna K. Lappalainen¹

1 University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

ABSTRACT: The key question is Why understanding of Atmosphere – Earth Surface – Biosphere is important for Climate Change. Tools for understanding of these interactions and feedback are the PEEEX, GlobalSmear, and Climate University. The [PEEX](#) (Pan-Eurasian Experiment Program): for understanding the Atmosphere – Earth Surface – Biosphere in the Arctic – boreal context / Northern Eurasia / Silk Road Region (since 2012). The [GlobalSMEAR](#) (Stations Measuring Earth Surface Atmosphere Relations) is initiative for Global Earth Observatory for filling the observational gap of the atmospheric – ecosystem in-situ data (since 2015). The [CU](#) (Climate University) is free online courses for universities and everyone who wants to make the sustainability transition in the society real (since 2018).

The [PEEX Science Plan](#) includes 4 major blocks: Research, Research Infrastructure, Knowledge Transfer, and Impact on Society. The information is disseminated continuously through the [PEEX Blog/News](#) and [NewsLetters](#) on a quarterly basis.

The aim is strengthening the PEEEX activities in the Arctic-boreal context and with China and expanding and renewing network with the Near Europe Neighborhood and Newly Independent States countries. Since Spring 2022, the collaboration was frozen with 40+ Universities/ Research Organisations from RU and BY. Currently, there are 38 Partners with signed MoUs, and since Apr 2024 signed 12 new MoUs, and 16 are in discussions/ signing process. The [special PEEEX Part-II issue in ACP](#) as well as in the Big Earth data journal was open for publishing peer-reviewed publications. PEEEX is actively involved with Partners into preparations of research and educational proposals with various sources of funding on international and national levels.

There is a need for advanced in-situ stations with vision of global observation network (GlobalSMEAR) with 1000 or more well-equipped ground stations around the world that track environments and key ecosystems fully and continuously. Researchers could find new mechanisms and feedback loops in this coherent data set, policymakers could test policies and their impacts, and companies could develop environmental services. SMEAR-II in Hyytiala (Finland) is key of such stations located in the boreal forest countryside. Network of such SMEAR stations is a research infrastructure to proof of concept for meeting the UN SDGs, and it is potential for global comprehensive feedback analysis.

The PEEEX-Modelling-Platform is important for research and development for seamless/online integrated meteorology-chemistry-aerosols feedbacks and interactions in weather, climate and atmospheric composition multi-scale modelling. PEEEX-MP objectives are to analyze importance of meteorology-chemistry-aerosols interactions and feedbacks; and to provide a way for development of efficient techniques for online coupling of NWP and ACT via process-oriented parameterizations and feedback algorithms.

The PEEEX Education / Knowledge Transfer includes activities related to educational projects including Virtual Exchanges, [Climate University](#), and [benchmarked courses](#). PEEEX science diplomacy/ impact on society includes AASCO (The Arena for the Gap Analysis of Existing Arctic Science Co-Operations) activities.

The [ACCC](#) (Atmosphere and Climate Competence Center) is a Finnish Flagship focused on addressing two of the most urgent global Grand Challenges: climate change and deteriorating air quality. From deep scientific understanding to practical solutions.

P02: INSTITUTE OF IONOSPHERE RESEARCH AND EDUCATIONAL ACTIVITIES

Alena Yelisseeva¹, Tatiana Dedova¹

¹ Institute of Ionosphere, Kazakhstan Academy of Sciences (IoI KAS), Kazakhstan

ABSTRACT: abstract is not provided/ available

P03: DEPARTMENT OF ATMOSPHERIC PHYSICS - RESEARCH OF ATMOSPHERIC DYNAMICS, CLIMATE, ATMOSPHERIC CHEMISTRY ACROSS SCALES: FROM STREET LEVEL MODELLING TO GLOBAL PHENOMENA

Tomas Halenka¹, Peter Huszár¹, Michal Belda¹, Eva Holtanová¹,
Petr Pišoft¹, Petr Šácha¹, Vladimír Fuka¹, Hynek Bednář¹

¹ Charles University in Prague (CUNI), Department. of Atmospheric Physics, Prague, 182 00, Czech Republic & the PERUN team

ABSTRACT: The Department of Atmospheric Physics from the Faculty of Mathematics and Physics at the Charles University in Prague is introduced. This is the only university department in the Czech Republic where comprehensive education in the field of meteorology and climatology, including mathematical-physical description, is provided in full extent, with strong mathematics and physical background. After a full 3 years' course on Physics and supporting Mathematics (Bachelor's degree), with a few starting specialized topics, full meteorology and climatology is taught for Master degree in further 2 years, and finishing with State Exam. CUNI provides the PhD degree study as well, in connection to scientific directions listed below.

These directions are: (1) Modeling Atmospheric Chemistry and Air Quality: interactions between weather/climate and atmospheric chemistry, specifics of urban areas; (2) Modeling of Flow in the Atmospheric Boundary Layer, Micro-scale Modeling: modeling atmospheric turbulence, modeling small-scale flows and urban environments, modeling transport, dispersion, and transformation of pollutants in the atmosphere; (3) Study of Climate System Dynamics and Development: numerical modeling of climatic processes, climate models, climate change issues and future projections, urban climate, geoengineering; (4) Middle Atmosphere Processes and Atmospheric Waves: stratosphere, stratospheric ozone, mesosphere, the role of atmospheric waves (mainly gravity waves), large-scale circulation; and (5) Nonlinear Dynamic Systems in the Atmosphere: deterministic chaos and predictability of atmospheric processes.

The research topics from individual scientific groups are introduced.

P04: URBAN CLIMATE RISKS IN NORTHERN CITIES: RESEARCH AND EDUCATIONAL ACTIVITIES AT NERSC

Victoria Miles¹

¹ Nansen Environmental and Remote Sensing Center, Bjerknes Centre for Climate Research, Bergen, Norway

ABSTRACT: The Arctic is warming faster than any other region on Earth, and at the same time many northern cities are growing. These changes create new challenges for people living in cold climate urban areas. Buildings, roads, and other urban structures alter the local climate by trapping heat, changing wind patterns, and affecting air quality. As a result, northern cities may face stronger

heat island effects, poorer air quality, and greater risks from climate related hazards. Understanding these processes is essential for helping cities plan for a safer and more resilient future.

In this presentation, research and educational activities at the Nansen Environmental and Remote Sensing Center (NERSC) in Bergen, Norway are introduced. We use satellite observations, detailed computer models, and mapping tools to study how heat, pollutants, and climate extremes affect cities in the Arctic and sub-Arctic. Our goal is to translate scientific data into practical tools, such as indicators, maps, and scenarios, that can support urban planning and climate adaptation efforts. NERSC also plays an active role in education and international collaboration in urban climate science. Through initiatives like the URSA MAJOR program and partnerships with research networks around the world, we contribute to training the next generation of scientists. Our new Memorandum of Understanding with the PEEEX initiative creates exciting opportunities for joint research, shared learning, and co development of climate service solutions for northern cities.

P05: RESEARCH AND EDUCATION IN THE FIELD OF EARTH AND ENVIRONMENTAL SCIENCES AT THE O.M. BEKETOV NATIONAL UNIVERSITY OF URBAN ECONOMY IN KHARKIV, UKRAINE

Yuriy Vergeles¹

1 Department of Urban Environmental Engineering & Management, O.M. Beketov National University of Urban Economy in Kharkiv (BNUUEK), Ukraine

ABSTRACT: The research in the Earth and Environmental Sciences, as a solid field of studies, at the O.M. Beketov National University of Urban Economy in Kharkiv (the former Kharkiv State Institute of Municipal Engineers till 1994, then – Kharkiv National Academy of Municipal Economy till 2012) started in the earlier 1990s, when the Department of Urban Environmental Engineering & Management was established and the first of a kind university degree programme in Applied Environmental Science and Engineering was launched. In the 1990s, research activities at the Department tackled the environmental geochemistry of urban areas, environmental impacts of ferrous slags, municipal solid waste management issues and mathematical modelling of wastewater treatment processes at local to regional scales. In the late 1990s-early 2000s, researchers of the Department were involved in a number of EU-funded projects on experimental studies of constructed wetland (CWs) efficiency and feasibility towards municipal wastewater and municipal sludge treatment and in the UNEP's Global International Water Assessment Programme, being responsible for the coordination of the expert teams for Black, Caspian and Aral Seas' basins. Further research developments in the 2000s-2010s addressed issues of detection, monitoring and assessment of contaminants of emerging concern (CEC) in the aquatic environments of East Ukraine, their removal efficiency by means of CWs, as well as development of urban and regional ecological networks and broader aspects of environmental governance for cities, municipalities and communities. Since 2016 the Department provides for BSc, MSc and PhD degree programmes in the Environmental Studies and Environmental Protection Technologies. New research landmark emerged in 2013-2014 when the Department began continuous co-operation with the IAEA in the field of environmental isotope application to advanced studying and deeper understanding of the urban hydrological cycle. Recently, mainstream research direction shifted towards tracking, modelling and assessment of urban systems' vulnerability and adaptability to the climate change.

P06: CLIMATIC COMPLEXITY SCIENCE MEETS EARTH SYSTEM

Jingfang Fan¹

1 School of Systems Science, Beijing Normal University, China

ABSTRACT: The global warming, extreme climate events, and their associated socioeconomic impacts pose major risks to humanity. Owing to the nonlinear feedbacks, multiscale interactions, and complex structures of the Earth system, understanding and especially predicting such disruptive events remains a formidable challenge for both the scientific community and policymakers. In recent years, the emergence and development of Earth system science have attracted growing attention and has led to new concepts and analytical frameworks. In particular, complexity science-based approaches have been increasingly developed and applied to advance our understanding of Earth system dynamics and to improve predictive capability. In this presentation, I will provide a comprehensive overview of recent progress in integrating statistical physics and complex systems science into Earth system research. I will highlight how approaches including critical phenomena, network theory, percolation, tipping point analysis, and entropy can be used to better understand the dynamics, resilience, and predictability of complex Earth systems.

P07: ON RECENT ADVANCEMENTS IN ATMOSPHERIC AND AIR QUALITY MONITORING

Tuukka Petaja^{1,2}

1 University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

2 Aerosol, Clouds and Trace Gases Research Infrastructure - European Research Infrastructure Consortium (ACTRIS ERIC), Helsinki, Finland

ABSTRACT: The recent advancements in atmospheric and air quality monitoring are strongly driven by the development of coordinated research infrastructures and emerging regulatory requirements in Europe. The new EU Ambient Air Quality Directive introduces comprehensive measurement obligations, including the establishment of monitoring supersites and the systematic observation of pollutants such as ultrafine particles (UFP) and black carbon (BC). These requirements significantly expand the scope and complexity of air quality monitoring and call for harmonized measurement practices across Member States.

ACTRIS (Aerosols, Clouds and Trace Gases Research Infrastructure) plays a central role in supporting this transition by providing high-quality measurement standards, calibration facilities, and coordinated data services. Existing ACTRIS observational networks already include approximately 90 sites measuring UFP and BC, offering a strong foundation for the development of the future supersite network. In addition, ACTRIS contributes through training activities, instrument harmonization, and the development of near real-time data workflows, in collaboration with European organizations such as EEA, EMEP, AQUILA, and EURAMET.

The implementation of monitoring supersites across Europe presents challenges related to coordination, resource allocation, and standardization. Addressing these challenges requires enhanced collaboration at European, national, and regional levels, as well as the effective use of existing expertise and infrastructures.

This contribution highlights recent developments in atmospheric monitoring with a focus on integrated research infrastructures, harmonized observations of emerging pollutants, and capacity building. The role of ACTRIS in enabling high-quality, comparable, and policy-relevant air quality data is emphasized, along with its importance in supporting the implementation of European air quality legislation and advancing scientific understanding of atmospheric processes.

P08: ON THE GAP OF SCIENCE POLICY FOR AIR QUALITY: ENVIRONMENTAL GEOCHEMISTRY AND ATMOSPHERIC RESEARCH, IDAEA-CSIC

Xavier Querol¹

ABSTRACT: abstract is not provided/ available

P09: TOWARDS INTERACTIVE CARBON CYCLE IN ICON EARTH SYSTEM MODEL

Georgii Nerobelov¹

1 Max-Planck Institute for Biogeochemistry (MPI-BioGeoChem), Jena, Germany

ABSTRACT: The Earth System Models have included the effects of nitrogen and phosphorus on the land carbon budget and land biogeophysics in CMIP5 and CMIP6, respectively. Yet large uncertainties in the impact of these cycles on future trends prevail. To address this uncertainty, we developed a new configuration of the land surface model ICON-Land by coupling the description of land physical processes from JSBACH4 to a new representation of biosphere dynamics, including coupled carbon-nitrogen-phosphorus cycling (QUINCY). Here, we showcase first results from this new land configuration (with interactive carbon-cycle only) coupled to the ICON-XPP Earth system model in concentration- and emission-driven settings and provide the preliminary analyse of the resulting climate-carbon interactions.

P10: RESEARCH AND KNOWLEDGE TRANSFER ACTIVITIES AT FiBL

Tetiana Grabovska¹

1 Research Institute of Organic Agriculture (FiBL), Switzerland

ABSTRACT: The Research Institute of Organic Agriculture (FiBL) is one of the world's leading independent and non-profit institutions in the field of organic agriculture. Founded in Switzerland in 1973, FiBL conducts interdisciplinary research and develops practical solutions in close collaboration with farmers, the food industry, and policy stakeholders. Its core mission is to advance organic agriculture along the entire food system value chain and to promote sustainable, resilient agri-food systems through research, advisory services, and knowledge transfer.

FiBL's activities cover a broad range of scientific domains, including soil, crop, livestock, and food system sciences, as well as international cooperation and policy support. A key strength of the institute lies in combining applied research with real-world implementation, supported by long-term field experiments and participatory on-farm research. This approach enables the development of innovative, system-based solutions that address environmental, economic, and social challenges in agriculture.

Knowledge transfer is a central component of FiBL's work. Scientific findings are rapidly translated into practice through advisory services, training programmes, digital tools, and collaboration with stakeholders across the agricultural sector. By linking research with practice, FiBL supports farmers in improving productivity while safeguarding environmental and socio-economic sustainability.

Through its international network and projects in Europe, Africa, Asia, and Latin America, FiBL contributes to global efforts in climate change mitigation, biodiversity conservation, and sustainable food system transformation. The integration of research and knowledge transfer contributes to advancing and scaling organic agriculture worldwide.

P11: SYNTHESIS OF THE HORIZON PROJECTS IMPLEMENTED AT METEOROMANIA

Sorin Cheval¹

1 National Meteorological Administration (MeteoRo), Romania

ABSTRACT: The Romanian National Meteorological Administration (MeteoRo) plays a key role in advancing weather and climate services at both national and European levels, including both operational activities and coordination of Horizon Europe projects. Its leadership in Horizon Europe projects such as OptFor-EU, CARMINE, and CrossEU demonstrates a strong institutional capacity to drive multidisciplinary research, foster innovation, and ensure the operational uptake of scientific results.

This presentation talks about MeteoRo's overall experience as a project partner, but also coordinator, with a focus on how it has helped with climate resilience, risk assessment, and the creation of climate services that are useful to people. MeteoRo is in charge of helping climate-smart forestry within OptFor-EU by adding climate projections and risk indicators to decision-making tools made for managing forests. The government is helping to improve climate risk methods and make climate data easier to find and use for adaptation planning across Europe through CARMINE. In CrossEU, MeteoRo is in charge of activities that improve cross-sectoral climate services, encourage interoperability, and make the connection between climate information providers and end users stronger. MeteoRo is in charge of coordinating international consortia, making sure that data flows smoothly, and bringing together advanced numerical modeling, Earth observation data (including Copernicus services), and new digital technologies like machine learning across these projects. A lot of importance is placed on co-design and co-production processes, which means that climate services are made with the help of people from fields like forestry, agriculture, energy, and disaster risk management.

Overall, the presentation demonstrates how MeteoRo's coordination of Horizon Europe projects reinforces its position as a key actor in the European Research Area, contributing to the development of innovative, actionable climate services and supporting societal resilience to climate change and extreme weather.

P12: MISSION AND PROJECTS OF THE CLIMATE, ATMOSPHERE AND WATER RESEARCH INSTITUTE AT BULGARIAN ACADEMY OF SCIENCES

Ekaterina Batchvarova¹

1 Climate, Atmosphere and Water Research Institute - Bulgarian Academy of Sciences (CAWRI-BAS), Sofia, Bulgaria

ABSTRACT: abstract is not provided/ available

P13: WHAT IS GOING ON IN APPLIED MATHEMATICS IN SAARLAND?

Andreas Rupp¹

1 Saarland University (Department of Mathematics | Campus E1.1, DE-66123 Saarbrücken)

ABSTRACT: Applied mathematics is undergoing rapid development, driven by the need to model increasingly complex systems in science and engineering. In Saarland, this evolution is particularly visible through new research directions that combine modern numerical analysis with interdisciplinary applications. In this short overview talk, a snapshot of current activities and emerging themes in applied mathematics in the region is presented.

The presentation highlights methodological advances in the numerical treatment of partial (and ordinary) differential equations. These mathematical tools enable efficient and reliable simulation of complex physical processes across scales. Recent developments also include methods for

uncertainty quantification in PDE models defined on networks or thin structures, providing ways to rigorously analyse how model uncertainties propagate through simulations.

Beyond core numerical analysis, applied mathematics in Saarland is strongly connected to interdisciplinary applications. Examples range from modeling transport processes in porous media and soils to computational approaches motivated by engineering, materials science, and data-driven methods such as machine learning. These topics share a common theme: developing mathematically sound algorithms that make high-fidelity simulations feasible for real-world scientific problems.

The talk concludes with a brief outlook on opportunities for collaboration with atmospheric scientists, particularly in areas where advanced numerical methods, uncertainty quantification, and network-based PDE models can contribute to improved environmental and climate modeling.

P14: AIR QUALITY MODELLING AT AUTH

George Tsegas¹, Fotios Barmpas¹, Eleftherios Chourdakis¹,
Christos Vlachokostas¹, Evangelia Fragkou², Leonidas Ntziachristos²

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ABSTRACT: The interactions between different spatial and temporal scales are an active research area in the Sustainability Engineering Laboratory of AUTH, since they are recognised as a major mechanism determining the flow structure over dense urban canopies. The intense surface inhomogeneities introduce additional terms in the turbulent transport within the urban atmospheric boundary layer (ABL), which in effect generate equally intense temporal inhomogeneities. Aiming to address the modelling limitations which arise because of the physical differentials between the different scales, a novel two-way coupling scheme between the mesoscale model MEMO and the microscale model MIMO has been proposed, utilising a surrogate model based on neural networks. Application of this approach in the city of Paris has indicated that the dynamic effects of the main urban structures on the approaching ABL can be approximated effectively as an alternative to conventional surface-roughness approaches. The dominant influence of shipping emissions on air quality of port cities and their surrounding urban areas has also been demonstrated in a number of case studies. Air quality modelling led by the Laboratory of Applied Thermodynamics of AUTH in the frame of the EU EMERGE project aimed to quantify the impact of shipping emissions in coastal areas and port cities and assess the effect of proposed technical and legislative control measures in the shipping sector. The latter include the Tier III NO_x standards in selected regions since 2016, the upcoming fuel sulphur cap by 2020, the introduction of scrubbers and other emissions control systems as well as the use of alternative fuels. A high-resolution modelling approach was used for assessing the impact of present and future marine traffic on air quality of Piraeus, Greece and the neighbouring areas of the Athens megacity, taking into account the effect of proposed mitigation measures. Results indicate that these measures can lead to a reduction of the shipping contribution in urban hotspots near the port by 70 to 90% for SO₂ and by 25 to 35% for PM_{2.5}, while NO₂ contribution is reduced by 12-20%.

ABSTRACTS OF PRESENTATIONS DELIVERED on 9TH APRIL 2026

T01: INTEGRATED SYSTEMS AND ANALYSIS OF URBAN MOBILITY FOR CLIMATE-NEUTRAL, ENVIRONMENTALLY FRIENDLY, AND SUSTAINABLE CITIES IN EUROPE AND CHINA (IMTECC)

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ABSTRACT: The Focusing on the Sino-European cities (Copenhagen, Paris and Hangzhou), this project aims to provide tools and case studies for optimizing multimodal traffic management, improving urban mobility, reducing traffic emissions, and finding new solutions towards greener mobility practices, climate-neutral and smart cities. Based on big data, smart traffic management technologies, and integrated interdisciplinary methods, this project will build an Integrated Urban System (IUS) and key performance indicators (KPIs) for each city. With evolving urban planning, energy consumption, transport supply and demand, and group behaviours, the system will improve our understanding of interactions among urban multimodal mobility (e.g. combination of biking and trains), traffic emissions (e.g. switch to electric vehicles), air quality and climate change, and quantify these interactions for the Sino-European cities. The results allow to quantify the leverage effects observed, and to highlight issues of environmental justice. The system is building multi-scenario simulations (e.g. reduced parking space for private cars) and proposing multi-mode transport schemes suitable for sustainable development, simultaneously optimizing mobility, and reducing emissions and health and climate risks. Through collaborative analyses and cross simulations, a multi-mode transport scheme suitable for the sustainable development of Sino-European cities is further proposed. The results will establish a model for building smart cities, promoting Sino-European exchanges and cooperation, and jointly exploring climate neutrality pathways under future urbanization processes.

T02: SCENARIO-BASED AND CLIMATE-ADJUSTED PROJECTIONS OF PM_{2.5} AND SO₂ TO 2050: CHEMICAL TRANSPORT MODELLING EVIDENCE FROM WESTERN KAZAKHSTAN

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ABSTRACT: Air quality in Central Asia is shaped by the combined influence of industrial emissions, urbanization and climate change, yet remains insufficiently constrained by integrated observation and modelling frameworks. Western Kazakhstan is a representative case where intensive oil and gas development, dispersed industrial sources and strong meteorological variability interact to produce complex pollution patterns. This study presents a scenario-based and climate-adjusted assessment of future air quality dynamics, focusing on PM_{2.5} and SO₂ under projected socio-economic and climatic changes up to 2050.

The methodological framework integrates satellite observations, ground-based measurements, emission scenario modelling and chemical transport simulations. Satellite data from Sentinel-5P are compared with in situ observations using the Blada–Oldman approach to assess consistency and reduce uncertainties. This enables the integration of heterogeneous datasets in a data-sparse region.

Future emission trajectories are developed based on region-specific socio-economic scenarios, considering changes in industry, energy and transport. Emission projections for key pollutants are used as inputs for the WRF-Chem model to simulate atmospheric composition for 2030 and 2050.

The climate-adjusted component incorporates projected changes in temperature, atmospheric stability, wind fields and boundary layer processes, allowing assessment of both emission-driven and climate-modulated impacts on air quality.

Results indicate that climate change can amplify or offset emission trends depending on local meteorological conditions. Increased frequency of heatwaves and stagnant conditions is likely to enhance pollution accumulation, while shifts in circulation patterns may alter transport pathways. The findings demonstrate the importance of integrating climate variability into air quality management and highlight the value of coupled modelling approaches for policy support in regions with limited observational coverage.

T03: METEOROLOGICAL AND CLIMATIC RESEARCH AT TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV

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ABSTRACT: The formation of the meteorological research school began at Kyiv University almost from the time of its foundation (1834) and has deep historical roots, long-standing traditions, and distinguished names. In 1846, Ernest Knorr, a professor of meteorology, arrived in Kyiv. He was a graduate of the University of Berlin and had been a student and later an assistant to the world-renowned naturalist Alexander von Humboldt. Ernest Knorr began teaching a professional-level meteorology course at St. Vladimir's University in Kyiv (since 1994—Taras Shevchenko National University of Kyiv, hereinafter—TSNU). On his initiative and under his leadership, the university's Meteorological Observatory was established, which he headed until 1858. In 1949, with the aim of training highly qualified meteorologists, the Department of Meteorology and Climatology was established at the Geography Faculty of Taras Shevchenko National University of Kyiv.

Since 2002, the department has been headed by Serhii Snizhko, Doctor of Geography, Professor, and Honored Worker of Education of Ukraine.

The training of meteorologists is conducted by a consortium consisting of full-time faculty members from the department, related departments of the Faculty of Geography and the Faculty of Information Technology, leading scientists from the Ukrainian Hydrometeorological Institute of the National Academy of Sciences of Ukraine, and practicing professionals from the Ukrainian Hydrometeorological Center. Since 2006, the Department of Meteorology and Climatology has operated a Synoptic Training Laboratory.

The scientific research carried out at the Meteorology and Climatology Department focuses on the problems of human biometeorology, urban meteorology, air pollution, agrometeorology, atmospheric circulation, as well as issues of general and applied climatology. The Department's staff participate in national and international research projects devoted to the impact of climate on water resources, hydroecological assessment and forecasting of the hydropower potential of Ukrainian rivers under climate change, development of measures for adapting water management to climate change (UNEP Technology Needs Assessment "TNA": Ukraine project), adaptation of urban areas to climate change, and urban and human biometeorological studies.

During the period 2016–2026, the Department of Meteorology and Climatology participated in the implementation of three projects of the European Erasmus+ Programme: ECOIMPACT «Adaptive learning environment for competence in economic and societal impacts of local weather, air quality and climate» (2016-2019), CLUVEX «Climate University for Virtual Exchanges» (2023-2026), DOMANI «Developing Micro-credentials Ecosystems in Ukraine and Mongolia for Competitive and Resilient Green Economies» (2024-2027).

T04: RENEWABLE ENERGY - INTEGRATED MASTER PROGRAM AT UiT – THE ARCTIC UNIVERSITY OF NORWAY

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ABSTRACT: The United Nations sustainable development goal for energy (SDG-7) aims to ensure access to affordable, reliable, sustainable, and modern energy for all. This goal emphasizes the importance of expanding energy access, increasing the share of renewable energy in the global energy mix, and improving energy efficiency. Achieving SDG-7 enables for green development across various sectors and creates jobs in health, education, and industry. Answering the UN SDG-7 call, UiT - The Arctic university of Norway has established a research group and the 5-years integrated master program to educate civil engineers in renewable energy. Besides this program, the university opens for 2-years master program in physics where renewable energy could be selected as a specialization. Both study programs are open for international applications. Education for EU citizens are free of charge, whereas others would have to contribute with a moderate fee, which is often covered by different stipend schemes. At higher level, the university opens for applications for individual PhD programs with industrial co-funding. The co-funding rates are stipulated by the Norwegian Research Council.

T05: SIMULATING AEROSOLS IN COLD REGIONS WITHIN EC-EARTH

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ABSTRACT: Aerosols play a critical role in the climate system of cold regions, where their interactions with clouds, radiation, and snow–ice surfaces strongly influence energy budgets. We present recent advances in cold region aerosol modeling within Earth System Model (ESM) EC-Earth. We have extensively evaluated the EC-Earth aerosols in the Arctic against in-situ observations both at high-latitude stations and onboard the Polarstern research vessel during MOSAiC expedition 2019-2020. Based on our findings on simulated structural biases and missing sources, we have introduced several new processes to EC-Earth, including early aerosol growth from marine precursors and blowing snow over sea ice. The updated model gives indication about the potential role of the missing or poorly described processes in cold regions and beyond.

T06: SEAMLESS MODELING STUDIES OF AEROSOL-METEOROLOGY INTERACTIONS AT THE UKRAINIAN HYDROMETEOROLOGICAL INSTITUTE

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ABSTRACT: Aerosol emissions from different sources can contribute to the modification of meteorological processes through direct and indirect aerosol effects, thereby impacting weather at regional and local scales. Considering the role of aerosol effects in complex atmospheric feedbacks and the need for seamless modeling approaches for such research, the Ukrainian Hydrometeorological Institute (UHMI) established research and modeling activities within the framework of the Pan-Eurasian EXperiment (PEEX) in close collaboration with the University of Helsinki (UHEL), using the Environment – HIgh Resolution Limited Area Model (Enviro-HIRLAM). The first studies focused on the role of black carbon in direct aerosol effects during the

severe summer wildfires of 2010. Modeling activities subsequently expanded into new projects aimed at assessing the impact of biomass burning and dust aerosols on meteorological conditions, as well as examining how aerosol-meteorology interactions differ under land use/ land cover changes. Analysis of different case studies revealed that aerosols influence meteorology in different ways depending on synoptic conditions. This led to a series of studies investigating the weather fronts, heat waves, extreme rainfall and snowfall events, mid-latitude deep cyclones, and other weather patterns. A brief history of seamless modeling studies at the UHMI and the main outcomes achieved through this research are presented.

T07: FOREST DATA SCIENCE AND IOT IN THE TIMES OF AI – PARADIGM SHIFTS IN RESEARCH AND EDUCATION

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ABSTRACT: The presented work explores the emerging synergy between forest data science, Internet-of-Things (IoT) sensing, and artificial intelligence (AI) within the context of the SMEAR-Estonia station.

A modular data-processing workflow has been implemented using Python, R, Golang and Jupiter notebooks, containerized in Docker and orchestrated on a mixed-CPU/GPU HPC node (AMD RYZEN AI MAX+ PRO 395, Radeon 8060S). The pipeline ingests heterogeneous data streams—eddy covariance, meteorology, GIS land-cover, forest-management records—and produces gridded products via an ML layer built on scikit-learn and PyTorch. Hierarchical Density-Based Spatial Clustering (HDBSCAN) is employed to delineate zones of maximal CO₂ flux within the tower footprint, enabling automated detection of spatial patterns without manual parameter tuning.

To expand observational coverage, low-cost CO₂ sensors e.g. the SCD4x and the open-source IoTempower framework have been prototyped. Sensors are networked via MQTT through smartphones as mobile gateways, providing real-time data acquisition, local storage, and opportunistic uplink to cloud or on-premise servers. Field trials in Oulanka National Park and co-location experiments at SMEAR-Estonia demonstrate that, after calibration against high-precision laser-based analyzers, the inexpensive sensors achieve acceptable accuracy when post-processed with a random-forest correction model.

Groundwater-table monitoring using pressure transducers producing continuous water-level time series that feed into catchment-scale hydrological models.

The computational platform runs self-hosted large language models (LLMs) such as GPT-OSS-120B-Q4-K-M and GLM-4.7-Flash-Q8 via llama-cpp, enabling on-site code assistance, documentation generation, and fine-tuning with SMEAR data. This self-hosting approach ensures data sovereignty, reduces reliance on external APIs, and offers trustworthy, domain-specific inference for research and education.

Conclusions

The integration of IoT-enabled low-cost sensors, robust data-fusion pipelines, and on-premise AI models constitutes a scalable framework for high-resolution monitoring of forest ecosystems. This approach not only augments traditional flux-tower observations but also paves the way for distributed, AI-assisted environmental monitoring, fostering new research opportunities and enhancing pedagogical tools in forest data sciences.

T08: INTEGRATING CLIMATE EDUCATION IN AGRICULTURAL CURRICULA: INSTITUTIONAL MISSION AND CAPACITY BUILDING

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ABSTRACT: The climate change increasingly affects agricultural production, natural resource management, and food security, which requires strengthening climate competencies among future agricultural professionals. This study aims to examine approaches to integrating climate education into agricultural higher education and to demonstrate institutional mechanisms for implementing climate-related curricula using the example of Bila Tserkva National Agrarian University (Ukraine).

The research is based on a qualitative case-study approach that analyses institutional strategies for curriculum modernization, the integration of climate-related topics into educational programmes, and the development of interdisciplinary learning modules. Particular attention is given to the pilot implementation of climate-oriented modules within master's programmes in agronomy, economics, veterinary medicine, food technology, and also public administration, and law during the 2025–2026 academic year. The study also evaluates the role of international academic cooperation, particularly through the Erasmus+ ClimEd project, in strengthening institutional capacity for climate education.

The findings demonstrate that effective integration of climate education requires a systemic institutional approach combining dedicated environmental courses, interdisciplinary curriculum design, and the incorporation of climate topics into professional disciplines. Participation in international projects enabled the development of new climate-focused modules, digital learning resources, and innovative teaching approaches aimed at improving students' competencies in climate change mitigation, adaptation strategies, and climate-informed decision-making.

The study highlights the importance of embedding climate competencies in higher education standards across different fields of study and supports the use of interdisciplinary curricula and international collaboration as tools for strengthening universities' capacity to address climate challenges.

T09: HOW CLIMATE CHANGE AFFECTS INTANGIBLE HERITAGE: THE CASE OF CATALAN HUMAN TOWERS

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ABSTRACT: The climate change is increasingly affecting the environmental suitability of outdoor intangible cultural heritage practices. Using castells (Catalan human towers) as a case study, recent research has documented a sustained warming signal during major summer exhibitions in Catalonia between 1951 and 2023/2024, with temperature trends of roughly +0.3 to +0.42 °C per decade and a clear concentration of positive anomalies in recent decades. This evolution has been accompanied by a deterioration in thermal comfort, as shown by increasing Heat Index values during the typical performance hours.

At event scale, in-situ observations in urban squares show that thermal exposure during exhibitions is frequently intensified by local microclimatic conditions. Measurements collected in summer 2024 indicate that temperatures often exceeded 30 °C and that Heat Index values were commonly within the caution or extreme-caution categories. Comparisons with nearby automatic meteorological stations further indicate that urban squares can experience higher temperatures than surrounding areas, highlighting the relevance of urban heat island effects and the limitations of

relying exclusively on standard station data to assess actual exposure conditions during cultural events.

These results support the interpretation of intangible cultural heritage as a climate-sensitive socio-cultural system exposed to both long-term warming and site-specific urban thermal amplification. They also indicate that adaptation measures are becoming necessary to reduce heat-related risks for participants and audiences. Among the responses evaluated, rescheduling exhibitions from midday to evening improves thermal conditions, although evening periods are also warming and do not eliminate exposure risk entirely.

T10: AIR QUALITY MONITORING USING LOW-COST SENSORS NETWORK IN AMMAN CITY IN JORDAN

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ABSTRACT: This study presents a detailed assessment of air quality in Amman using a network of low-cost sensors, with a focus on fine particulate matter (PM_{2.5}), one of the most harmful air pollutants due to its ability to penetrate the respiratory system and enter the bloodstream. Exposure to PM_{2.5} is linked to respiratory and cardiovascular diseases and increased premature mortality. The study identifies key factors influencing PM_{2.5} levels in Amman, including traffic density, human activities, meteorological conditions such as wind and humidity, and natural dust events .

The AirBeam-3 sensor was selected as the primary monitoring device due to its portability, real-time data recording, ease of use, and low cost compared to traditional monitoring stations. A total of 12 sensors were strategically distributed across Amman to represent different land-use types, including residential, industrial, and commercial areas, while also considering proximity to pollution sources and topographic variation.

Data were collected continuously at one-minute intervals over a full year in 2025, providing high temporal resolution. Quality control procedures included calibration, removal of anomalous values, and aggregation into hourly, daily, and monthly averages. The data were analyzed using Microsoft Excel for temporal trends and ArcGIS for spatial analysis, including IDW interpolation to map pollution distribution.

The results reveal a clear seasonal pattern, with PM_{2.5} concentrations peaking during winter, particularly in January and December, due to atmospheric stability, temperature inversions, and increased heating emissions. In contrast, levels decrease significantly in spring and reach their lowest in summer, when higher temperatures and stronger winds enhance pollutant dispersion.

Spatially, higher pollution levels are observed in densely populated areas, industrial zones, and along major roads, especially in southern and southeastern parts of the city. Lower concentrations are found in northern and northwestern areas, which benefit from higher elevation and better ventilation. Overall, the findings highlight the role of both natural and human factors in shaping air quality and demonstrate the effectiveness of low-cost sensor networks in supporting data-driven environmental management.

T11: IDSSD DSP: DIGITAL SUSTAINABLE DEVELOPMENT GOALS PROGRAMME

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ABSTRACT: The Digital Sustainable Development Goals Programme (DSP) is a Science Programme proposed by the International Research Center of Big Data for Sustainable

Development Goals (CBAS), in cooperation with 35 global science institutes and organizations. It operates under the framework of the International Decade of Sciences for Sustainable Development (IDSSD) led by UNESCO, aiming to use emerging digital technologies to promote the sustainable development agenda and deepen the understanding of human-nature interaction. Against the backdrop of slow progress in the 2030 Agenda for Sustainable Development, DSP addresses global challenges such as climate change, inequality and biodiversity loss. It solves systemic barriers including siloed policies, uneven digital infrastructure and static data reporting by leveraging space technology, Big Earth Data, AI and Large Models, with standardized frameworks to ensure equitable access and interoperability. DSP's vision is to build a fully digitized road map for sustainable development using advanced digital technologies and earth sciences. Its mission is to reshape the SDG reporting system, promote data-driven governance, and foster inclusive knowledge access. It focuses on four key objectives: discovering SDG-related knowledge, developing a digital reporting framework, enhancing capacity building, and promoting international cooperation.

T12: MECHANISM AND TECHNOLOGY APPLICATION OF NON-UNIFORM ENVIRONMENT CREATION IN LARGE PUBLIC BUILDINGS

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ABSTRACT: In large public buildings, indoor environments are typically regulated based on the assumption of spatially uniform conditions and averaged occupancy loads. However, in reality, human activities are highly dynamic and spatially heterogeneous, leading to non-uniform distributions of thermal conditions and pollutant concentrations. This mismatch between actual environmental states and conventional control strategies often results in both local discomfort and unnecessary energy consumption.

This study aims to reveal the formation mechanism of non-uniform indoor environments driven by multi-source disturbances, including human movement patterns and outdoor environmental fluctuations. Human activities are modelled as spatiotemporally varying disturbance source terms, and their coupling effects with airflow and ventilation systems are analysed to characterize the evolution, propagation pathways, and response delays of key environmental parameters such as temperature and pollutant concentration.

Based on this mechanism, a data-driven framework is proposed for rapid identification and prediction of environmental states in complex scenarios. The approach integrates sensor data and dynamic modeling techniques to capture the transient and localized characteristics of indoor environments.

The proposed methodology provides both theoretical insights and practical solutions for achieving energy-efficient and occupant-oriented environmental control in large public buildings, contributing to the development of intelligent and low-carbon building systems.

T13: AISUS+: AI AS FUTURE CLIMATE-ENVIRONMENT RESILIENT, SUSTAINABLE CITY GOVERNANCE INFRASTRUCTURE

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ABSTRACT: Cities are the primary arenas where climate change, air pollution, ecosystem degradation, and socio-economic inequality converge, making them critical laboratories for sustainable development and climate-environment resilience. This work presents AISUS+, a comprehensive, science-based framework for establishing AI-empowered Urban Sustainable and Climate-Environment Resilient Systems, demonstrated through six initial pilot cities representing diverse climatic, socio-economic, and governance contexts. Distinct from application-focused AI studies, AISUS+ is positioned as a foundational urban intelligence architecture that integrates advances across air quality and atmospheric chemistry, Earth system modeling, multi-modal monitoring, AI-driven data fusion, and collaborative governance. Air quality and atmospheric chemistry are placed at the core scientific spine of the framework, reflecting their central roles in urban health, climate feedbacks, emission governance, and sustainability metrics. AISUS+ advances the frontier of city science by coupling AI-augmented chemical transport modeling, dynamic emissions inversion, integrated monitoring networks, and Earth-system digital twins with state-of-the-art AI methodologies, including physics-informed learning, foundation models, and communication models. Beyond prediction, the framework operationalizes science-to-governance pathways, enabling SDG/ESG-aligned decision support, multi-hazard early warning, and participatory urban climate governance. By synthesizing atmospheric science, environmental chemistry, AI, and sustainability governance into a unified architecture, AISUS+ provides a scalable blueprint for cities seeking scientifically grounded pathways toward carbon neutrality, clean air, climate-environment resilience, and equitable development.

T14: PM₁₀ CONCENTRATIONS IN ISTANBUL: A COMPARATIVE ANALYSIS OF 2024 AND 2025

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ABSTRACT: The particulate matter with an aerodynamic diameter of 10 μm or less (PM₁₀) is a major air pollutant affecting urban air quality and public health. Istanbul, a megacity with complex topography and diverse emission sources, exhibits strong spatial and temporal variability in PM₁₀ concentrations. This study presents a comparative analysis of PM₁₀ levels in Istanbul for the years 2024 and 2025 using data from air quality monitoring stations that satisfy data completeness criteria ($\geq 75\%$). Monthly, seasonal, and spatial variations are examined, and interannual differences are

evaluated in relation to meteorological conditions and urban emission patterns. The results are discussed in the context of previous PM₁₀ studies conducted in Istanbul, providing an updated assessment of recent trends in particulate matter pollution. The findings contribute to the understanding of short-term variability in urban PM₁₀ concentrations and support evidence-based air quality management strategies.

T15: FAST-TRACK FUTURES: BRIDGING EDUCATION AND WORK

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ABSTRACT: The challenge in the Central Baltic region is that the youth unemployment is quite high compared with other EU countries. In particular, in Finland it is 23.2% (or 146k unemployed young people, YP), in Latvia - 13,4% (or 9k), and in Estonia - 18% (or 6k). There is a considerable labour market slack (employment supply and demand mismatch) in this area in age 15–74 (Eurostat, 2024): in Finland - 14-15%, in Latvia - 10-11%, and in Estonia - 10-11%.

The REOPEN (Next Generation Workforce – Empowering Young People for Improved Employment; Sep 2025 – Feb 2028; <https://centralbaltic.eu/project/reopen>) project main aim is to create a very practical joint cross-border solution for these challenges, and to decrease mismatch between the employment supply and demand. This can be achieved by: (i) well-designed education /training in collaboration with employers, (ii) expanding cross-border collaboration to diversify the skills and needs match opportunities, and (iii) lowering the barriers to enter the labour market for YP. Note, the REOPEN project is project of the Interreg Central Baltic Programme (<https://centralbaltic.eu>) co-funded by the European Union.

T16: PERSISTENT LOW-WATER PHASE OF MAJOR UKRAINIAN RIVERS FLOWING INTO THE NORTH-WESTERN BLACK SEA UNDER ONGOING CLIMATE CHANGE

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ABSTRACT: Freshwater inflow from the Dnipro, Southern Buh, Dniester, and Danube rivers plays a key role in shaping the hydrological regime, salinity gradients, and thermohaline structure of the northwestern Black Sea (NWBS). Recent climate-driven changes, combined with anthropogenic regulation, have substantially modified river runoff patterns in southern Ukraine, with direct implications for coastal ecosystems and marine processes.

This study assesses long-term discharge variability for the period 1981–2021, complemented by the most recent observations up to 2024. The analysis revealed a pronounced and persistent transition to low-water conditions across all major rivers discharging into the NWBS.

The Southern Buh demonstrates the most critical situation, with discharge reaching historical minima in 2020 and maintaining a declining tendency. The Dnipro shows a prolonged low-flow phase over the last decade, including record-low values in 2015 and 2020. The Dniester, previously characterized by cyclic alternation of high- and low-water periods, has predominantly remained in a low-water regime in recent years. The Danube, despite earlier multi-year oscillations, has also entered a stable low-flow phase since 2016.

The simultaneous persistence of reduced discharge in all major rivers during the past decade indicates a systemic hydrological shift in the region. These findings suggest that low-water

conditions should be considered a new baseline scenario for hydrological and coastal modelling of the NWBS under ongoing climate change.

T17: BEYOND INDIVIDUAL PROJECTS: ODESA POLYTECHNIC NATIONAL UNIVERSITY AS A HUB FOR THE DEVELOPMENT OF TRANSDISCIPLINARY R&D CLUSTERS

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ABSTRACT: Universities increasingly face the challenge of integrating education, research, and innovation within complex global research ecosystems. The TRIA (Transdisciplinary R&D Initiative Architecture) model is presented which was developed at Odesa Polytechnic National University as an institutional framework for organising these processes through transdisciplinary R&D clusters and global research initiatives. TRIA structures university development around long-term initiatives capable of generating portfolios of projects across multiple international funding programmes rather than responding to individual calls with isolated proposals.

The TRIA architecture is based on four core principles: initiative-driven research development, programme interoperability and translatability across funding schemes, integration of education and research through project-based learning, and the formation of transdisciplinary R&D clusters connecting engineering, artificial intelligence, environmental sciences, and social innovation.

At Odesa Polytechnic, seven strategic initiatives form the operational layer of this architecture. These include intelligent cyber-physical systems and robotics (SACPS, AICSAR), AI-driven data analytics and quantum-inspired computing (AIDAQ), atmospheric monitoring and environmental observation networks (AQAM-UR, AQAM-CE), sustainable energy systems and smart infrastructure (SERLI-SI), innovation ecosystems for future technologies (IREE-FT), responsible artificial intelligence and governance (ATARI), and sustainability-oriented transformation of higher education (SUST-INC, CLIMGOV).

A central element of TRIA is the integration of students into R&D clusters through project-based learning, enabling interdisciplinary collaboration and a gradual transition from learning to research, innovation, and entrepreneurial activities within emerging innovation ecosystems.

By aligning global initiatives with education and international project ecosystems, Odesa Polytechnic National University positions itself as a hub for the development of transdisciplinary R&D clusters contributing to emerging Earth system observation infrastructures, including atmospheric monitoring networks and environmental sensing systems, while strengthening collaboration within international research frameworks such as Pan-Eurasian Experiment (PEEX).

T18: REGIONAL SCALE MODELLING FOR EUROPE: TOWARDS CLIMATE AND AIR QUALITY MODELLING CONVERGENCE

Sandro Finardi¹, N. Pepe¹, Paola Radice¹

1 ARIANET, Milan, Italy

ABSTRACT: The air quality and climate are interconnected. Some air pollutants are also climate forcers that can have warming (e.g. ozone and black carbon) or cooling effect (e.g. sulphates). On the other hand, climate can impact local air quality. Higher temperatures have impact on atmospheric dispersion, deposition and chemistry of pollutants, e.g. enhancing the formation of ground level ozone. Climate and air quality policies better interconnection is desirable; the evaluation of air quality measures should consider the climate change impact on their effectiveness

together with their feedback on climate change mitigation. To improve the description of short-lived climate forcers impact on climate and air quality the Horizon Europe FOCI project has pursued a comprehensive regional scale modelling of meteorology and atmospheric composition maintaining coherence with CMIP6 simulations by EC-Earth3 model and its driving emissions. The regional scale models have been verified versus observations and reference reanalysis over Europe during the latest part of the historical period (2005-2019). Results obtained by the WRF-FARM modelling system are presented for surface meteorology and atmospheric composition, showing its reproduction of continental scale variability of meteorology and atmospheric composition. WRF showed a cold bias over long-term mean temperature and tendency to overestimate near surface wind speed. Maximum annual rates of change of temperature are located over the eastern continental Europe. Reduction of rainfall is seen over continental Europe while increase is predicted over part of France, the Mediterranean area and southern UK, but with less confidence. FARM showed prevailing underestimation of NO₂ concentrations, while it overestimated the mean O₃ concentrations over continental Europe, with prevailing underestimation over Southern Europe during summer. The PM_{2.5} concentrations have been reconstructed with small bias by FARM at background station locations. The comparison of predicted meteorology and pollutants' concentration with regional background observations allowed to verify the models' accuracy in reproducing meteorological and pollutant concentration changes and trends observed during the 15-year period analysed, confirming their suitability to predict future atmospheric compositions consistently with CMIP6.

T19: HIGH LATITUDE DUST RESEARCH: FROM OBSERVATIONS TO IMPACTS ON CLIMATE AND SOCIETY

Pavla Dagsson-Waldhauserova^{1,2,3}

1 Agricultural University of Iceland (AUI), Hvanneyri, Iceland

2 Faculty of Environmental Sciences, Czech University of Life Sciences Prague, Czech Republic

3 Icelandic Aerosol and Dust Association (IceDust), Keldnaholt, Reykjavik, Iceland

ABSTRACT: The high latitudes include active desert regions with at least 5% production of the global atmospheric dust. Active High Latitude Dust (HLD) sources cover more than 1.6 million km², and these are located in both the Northern (Iceland, Alaska, Canada, Greenland, Svalbard, North Eurasia, and Scandinavia) and Southern (Antarctica, Patagonia, New Zealand) Hemispheres. In polar regions, HLD was recognized as an important climate driver in the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate in 2019. Sand and dust storms, including HLD, were identified as a hazard that affects 11 of the 17 Sustainable Development Goals (SDGs). Atmospheric dust in-situ measurements conducted in the Arctic and Antarctic arid regions revealed up to 1000 times higher concentrations than recommended health standards. Icelandic dust has impacts on atmosphere, cryosphere, marine and terrestrial environments. socio-economic sectors (health, road safety, energy production, aviation, land degradation, etc.), and indigenous peoples. HLD research community is growing, and Icelandic Aerosol and Dust Association (IceDust) has more than 110 members from 57 institutions in 22 countries (www.ice-dust.com). IceDust is a member aerosol association of the European Aerosol Assembly and Thematic Network on HLD operates under the UArctic (University of the Arctic). Unique, there is also an important progress in science-art cooperation on HLD.

T20: DEVELOPMENT AND APPLICATION OF ATMOSPHERIC TRANSPORT MODELS FOR ASSESSING RADIOACTIVELY CONTAMINATED SITES

Ivan Kovalets¹

ABSTRACT: The management and remediation of radioactively contaminated sites often require the application of mathematical models for environmental impact assessment and evaluation of different options targeted to reduce the hazards associated with the presence of contamination on the territory. In Ukraine, there are such unique radioactive sites, such as the Chernobyl Exclusion Zone and the territory of the former uranium production Pridneprovsky Chemical Plant (PChP, Kamianske, Dnipro region). The atmospheric pathway of radioactive contamination is important in both cases, while this report mainly discusses the problem of air pollution originating from the PChP site. The atmospheric transport of radionuclides from the uranium storage facilities of the former PChP is classified into three types of problems: 1) radon contamination; 2) radioactive aerosols, and 3) radioactive pollution near the contaminated buildings. For those three types of problems, the respective models have been developed, based on the familiar CALPUFF atmospheric transport model and CFD OpenFoam code. For the problem of radon contamination, it is demonstrated that the available data regarding the inventory of uranium tailings and measurements of radon emissions from their territories do not explain the observed average levels of radon contamination at the industrial sites and nearby settlements. It is proposed that the whole area of the industrial site significantly contributes to radon emissions due to many undocumented radioactive residues. For the problem of radioactive aerosols at PChP, the CALPUFF model is linked with parameterization of wind resuspension based on the famous Bagnold formula. The model is then able to reproduce the average observed levels of contamination and could be used for dose assessments for the nearby territories. Finally, for the case of contamination from contaminated buildings at the PChP site, dose assessments are performed for workers in the nearby areas under conservative meteorological conditions.

ABSTRACTS OF PRESENTATIONS DELIVERED on 14th APRIL 2026

PR1: GRAND CHALLENGES – FOR THE ONLY PLANET WE HAVE

Markku Kulmala¹

1 University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

ABSTRACT: Among the Grand Challenges there are climate change, air quality, biodiversity loss, deforestation, demography, urbanization, etc. What are the contributions to solving these challenges? Climate is changing but how? From ideas to implementation. The global energy challenge is well seen in changes 2010-2050 in world population, world GDP, and world energy supply. Atmospheric CO₂ increase is well identified on Mauna Loa Observatory data since 1960s starting from about 320 ppm and reaching gradually more than 430 ppm by 2025. The outcomes of scenarios up to 2100 are different, depending on reduction of emissions, sinks up, CarbonSink+, and solar management.

The integrated approach is critically important for helping to understand feedbacks, to reduce uncertainties, and to mitigate and adapt effectively. The Global Earth Observatory (GlobalSMEAR) integrated approach helps to overcome current fragmented observations for greenhouse gases, aerosols, air quality, ecosystems, climate, etc. To answer Grand Challenges the multidimensional, multidisciplinary, and multiscale approach is required. Continuous and comprehensive observations are required with SMEAR concept/type stations (allowing measurements of up to 1200 different variables) for global comprehensive feedback analysis. Collaborations are needed with ICOS, ACTRIS, eLTER, ANAEE, WMO-GAW.

PR2: BUILDING SCIENTIFIC CAPACITY IN THE GLOBAL SOUTH FOR CLIMATE JUSTICE

Max Paoli¹

1 The World Academy of Sciences (TWAS) - The United Nations Educational, Scientific and Cultural Organization (UNESCO)

ABSTRACT: The climatic disruptions have a dramatic disproportionate effect: communities in developing countries suffer the most, despite their historical emissions being comparatively low, or insignificant as in the case of Least Developed Countries (LDCs). In addition, IPCC Assessment Reports, which are superb documents of great scientific quality, may have one weakness: limited coverage of certain areas due to the small number of authors from LDCs. This contributes to 'climate injustice' and reflects one of the many faces of global inequality.

The World Academy of Sciences (TWAS; <http://www.twas.org>), a Programme Unit of UNESCO, set up 3 new programmes over the past 4 years to build scientific capacity in climate research in LDCs and to empower women scientists in taking forward science-based solutions to improve livelihoods affected by climate change. A brief outline of the programmes will be presented together with some examples of impact.

PR3: AN EYE ON METHANE: FROM MEASUREMENT TO MOMENTUM

Xuefei Li^{1,2}, James Lawrence France³, Andreea Calcan¹
& the IMEO team

1 International Methane Emissions Observatory (IMEO), United Nations Environment Program, Paris, France

2 Institute for Atmospheric and Earth System Research (INAR), University of Helsinki (UHEL), Helsinki, Finland

3 Environmental Defense Fund, Office of the Chief Scientist, Utrecht, The Netherlands

ABSTRACT: The ambition on methane emissions reduction is growing, and open, reliable, measurement-based and actionable data is essential to track changes in emissions over time. The ability of countries and companies to meet their goals relies on their ability to target action at the speed and scale required, as well as being able to demonstrate progress towards these goals.

As a core implementing partner of the Global Methane Pledge, the UN Environment Programme's International Methane Emissions Observatory (IMEO) has been tasked with creating a sound scientific basis for methane emissions estimates and is providing reliable, public, policy-relevant data to facilitate actions to reduce methane emissions.

The IMEO progress was shown towards developing its global methane data including satellite remote sensing data, science studies, national inventories, and measurement-based industry reporting, and how empirical data can drive real, tangible mitigation action in countries. The IMEO's Methane Science Studies around the world were highlighted across multiple anthropogenic methane emission sectors, especially Baseline Studies which couple multi-scale top-down approaches with more granular analysis of bottom-up data to improve the understanding of key methane emission sources in selected countries. The discussion was open on how IMEO could potentially collaborate with other research infrastructure and initiatives such as PEEX.

PR4: SUMMARY OF RECENTLY COMPLETED RI-URBANS PROJECT ON OBSERVATIONAL/ MEASUREMENT ACTIVITIES

Xavier Querol¹

1 Spanish National Research Council (CSIC), Barcelona, Spain

ABSTRACT: abstract is not provided/ available

PR5: SUMMARY OF RECENTLY COMPLETED CRICES PROJECT ON MODELLING ACTIVITIES

Risto Makkonen¹

1 Finnish Meteorological Institute (FMI), Helsinki, Finland

ABSTRACT: abstract is not provided/ available

PR6: SUMMARY OF ONGOING FOCI PROJECT

Tomas Halenka¹

1 Charles University (CUNI), Prague, Czech Republic

ABSTRACT: abstract is not provided/ available

OVERVIEW ON RECENT RESEARCH AT FUDAN UNIVERSITY FOR THE PEEEX DOMAIN

Bo Yao¹

1 Department of Atmospheric and Oceanic Sciences, Fudan University, China

ABSTRACT: The Fudan University has developed state-of-art measurement instruments for halogenated greenhouse gases and CO₂ mixing ratio at marine atmosphere, established integrated observation system in Yangtze River estuary, and led the fluorinated greenhouse gases alliance. Recent advances demonstrate how systematic monitoring reveals missing emission sources, how pollution episodes respond to meteorological and chemical controls, and how aerosol processes link atmospheric composition to climate.

PR8A: EDUCATIONAL ACTIVITIES IN ERASMUS+ CLUVEX/ UNAVEX/ CLIMED PROJECTS – VIRTUAL EXCHANGES/ TRAININGS FOR CLIMATE MESSENGERS, CLIMATE ADVOCATES, CLIMATE EXPERTS

Hanna K. Lappalainen¹, **Alexander Mahura**¹, Julia Karhumaa¹,
Laura Riuttanen¹, Aleksí Vauhkonen¹, Svyatoslav Tyuryakov^{1,2},
& the CLUVEX, UnaVEx and ClimEd teams

1 University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

2 Finnish Meteorological Institute (FMI), Helsinki, Finland

ABSTRACT: The online learning, is it the future of education? The concept of traditional education is changing since COVID-19 time, and being physically present in classroom isn't the only learning option anymore, especially with the rise of internet and new technologies. On practice, online learning - access to a quality education whenever and wherever you want as long as you can get online. Challenges of distance learning can be little interaction. The Virtual Exchange (VE) is a tool to increase interaction in distance education.

There are several Erasmus+ ongoing projects with VEs, coordinated by UHEL, such as (1) [CLUVEX](#) – Climate University for Virtual Exchanges (2023-2026), (2) [UnaVEx](#) – Una Europe for Virtual Exchanges for Sustainability (2024-2027), (3) [ClimEd](#) – Multilevel Local, Nation- and Regionwide Education and Training in Climate Services, Climate Change Adaptation and

Mitigation (2020-2026), and where the UHEL is the Partner such as (4) [REOPEN](#) – Next Generation Workforce – Empowering Young People for Improved Employment (2025-2028), and (5) [EMPOANDES](#) – EMPOwer ANDES societies to improve adaptation to climate change through the co-creation of climate services capacities (2025-2028).

The VEs organized by the CLUVEX and UnaVEx projects are currently the largest EU VEs projects in their field offer a unique opportunity to learn about remote working and teaching in an international environment. In these projects, the general aims are: (1) to design VEs concept for climate change and for sustainability education; (2) to bridge students from European, Neighborhood East, and African universities; (3) to engage and educate students with competencies in climate and green agenda together with interdisciplinary, green and soft skills and sustainability; (4) to train moderators for climate change and for sustainability education; (5) to educate up to 500 students in each 1 VE Week (5 VE Weeks in total, per project); (6) to educate altogether 5000 students as the “Climate Messengers” and the “Global Sustainability Advocates”; and (7) to upscale VE concept to various networks and partnerships internationally.

The educational platform used is the DigiCampus, the collaborative platform is Miro-board, and the communication platform is Zoom. DigiCampus area is used for sharing materials for students and moderators, including guidebooks, video-recordings and slides of lectures and tools for data analysis as well as group exercise called the “Climate Horizon”, and different questionnaires. After completion successfully of the VE Week, the participants/ students earned bonuses such as ECTS credits, certificates, status of Climate Messenger & Global Sustainability Advocate, and welcome to attend/ participate in online courses of the Climate University and Una Europa.

In the ClimEd project, the developed programme of [trainings](#) (7 in total with 54 learning outcomes; about 370 participants) included: (1) announcement of the training; (2) applications/ evaluation/ informing and assigning successful applicants to groups/ granting access to Moodle system; (3) training event (lectures, home-work-assignments as group’s projects, presentations/ defences); (4) evaluation of group’s presentations and awarding certificates; (5) e-evaluation of the training and of own (participants) learning outcomes and self-evaluation of the completed training.

PR8B: CLIMED - BUILDING CAPACITY FOR CLIMATE SERVICES IN UKRAINE

**Svyatoslav Tyuryakov¹, Hanna K. Lappalainen¹, Alexander Mahura¹,
& the ClimEd team**

¹ University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

ABSTRACT: The ClimEd project (2020-2026; <http://climed.network>) had focus on (1) understanding educational needs (assess gaps in education, competencies and enabling conditions does); (2) training staff (strengthen competencies of project staff in Ukraine - climate competencies and frameworks; digital tools for teaching and learning; course and MOOC development; sectoral application of climate services; standardisation and peer support); (3) developing courses (design climate services curricula); and (4) pilot the courses (test and implement in real-world settings).

ClimEd achievements are: (1) ClimEd Moodle deployed, classroom and IT equipment procured; (2) 455 staff training participations (134 onsite); (3) 48 new courses (7 PhD, 16 MSc, 25 professional development); (4) Piloted in Ukraine during 2025-2026 at 16 universities, 26 sectoral stakeholders; and (5) more that 600+ learners (360+ students, 240+ professionals).

Why ClimEd matters: (1) Skilled specialists and stronger institutions (improved qualifications of NMHS staff and sector -specific climate expertise across key domains - agriculture, construction, healthcare, energy, urban and water management); (2) Sustainable climate education ecosystem (integration into curricula, continued use of courses, access to blended and e -learning via the

project network); and (3) Long -term resilience and impact (capacity to develop and use climate services in key sectors, supporting long -term adaptation to climate change).

ClimEd project is in a sequence of 4 Tempus/ Erasmus+ CBHE educational projects coordinated by Prof. Sergej Zilitinkevich (1936-2021) at the University of Helsinki, culminating in ClimEd, followed by EMPOANDES project. Among these projects are the Combat-Meteo “Competency-based two-level curricula in meteorology” (2007-2010), the QualiMet “Qualifications framework in meteorology (2010-2013), the ECOIMPACT “Learning environment for local weather, air quality and climate impacts (2015-2019), the ClimEd “Building capacity for climate services in Ukraine (2020-2026), and the EMPOANDES “Empowering climate services in the Andes” (2025-2028).

PR9: COST ACTION PEEX-EU-NEN-REN “PAN-EURASIAN EXPERIMENT – EUROPE – NEAR EUROPE NEIGHBOURHOOD COUNTRIES EARTH SYSTEM RESEARCH NETWORK”

Hanna K. Lappalainen¹, Alexander Mahura¹

¹ University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

ABSTRACT: The PEEEX community prepares the COST Action proposal “Pan-Eurasian EXperiment – Europe – Near Europe Neighbourhood countries Earth System Research Network”. The overall research coordination objective is to establish COST Action as a multidisciplinary research network to answer PEEEX large-scale science questions, which are supporting the development of regional strategies for climate change adaptation and mitigation, air quality, impacts on the environment and population, their living conditions and health and ecosystem services. The specified scientific and operational objectives is that the Working Groups (WGs) and their objectives to be implemented through WGs meetings, online seminars/ webinars, annual sci. conferences, e-platforms, mobilities/ STSMs, YSSs, trainings, policy briefs. The capacity-building objectives are: New knowledge sharing; Training of young scientists; Transfer of knowledge; Disseminating research results; and International networking.

The Action aims are: (1) to open new opportunities for research collaboration in atmospheric, Earth’s and environmental sciences & to carry out joint research collaboration through mobilities of PhD students between Partners; (2) to assess the current environmental observations between the Partners, and to define actions towards harmonisation based on the Global-SMEAR concept; (3) to access knowledge gap for needs of modelling and to improve integrated multi-scales and -processes simulations and modelled data analyses; and (4) to educate new generation of young researchers and to introduce novel e-learning assets between involved Partners.

The Action expected outcomes and impacts are: (1) New potential research and educational initiatives for PhD students’ and young researchers’ projects; (2) Completed short-term scientific missions between Partners, and young scientist schools which support the completion of the PhD studies; (3) Established research and innovation network between Partners, and expanded by inviting new interested universities and organisations; (4) Organised webinars/ workshops/ conferences on research, observations / data harmonization and educational topics based on PEEEX and ACCC agendas and interactions between the Partners; and (5) Widely disseminated (during and beyond) COST Action activities and results to science community, stakeholders e.g., NGOs, SMEs, and general public.

The Action WGs are: (1) Research; (2) Observations and Data; (3) Integrated Modelling; and (4) Knowledge Transfer, with own WGs’ objectives, tasks, deliverables and milestones. In the COST Action, the national and international collaboration will be promoted on 3 levels between the Research fields (ecology – physics – technology – chemistry – meteorology – geography – social

sciences) in WG1; Research methodologies (theory – modelling – experiments – observations, in-situ observations, remote sensing observations; qualitative and quantitative research) in WGs 2-3; and the Universities, research institutes, companies and bodies at different policy- and decision-making levels in WG4.

ANNEX 1: DETAILED Agenda of the PEEEX-seminar on 1st April 2026

Schedule of the PEEEX online seminar on 1 April 2026:

11:00-11:15 - Welcome and Short Introductory to PEEEX

11:15-12:30 - Session I: Introduction of newly joined Partners/Organizations

12:30-12:45 - coffee/ tea break (15 minutes)

12:45-14:15 - Session II: Introduction of newly joined Partners/Organizations

14:15-14:30 - coffee/ tea break (15 minutes)

14:30-15:00 - Session III: Introduction of newly joined Partners/Organizations (continued)

15:00-15:30 - Wrap-up, next steps, discussions on the PEEEX COST Action proposal

- **11:00 (P01)** – Welcome and Short Introductory to PEEEX - by *Hanna K. Lappalainen* ([hanna.k.lappalainen\(at\)helsinki.fi](mailto:hanna.k.lappalainen@helsinki.fi)), *University of Helsinki, Institute for atmospheric and Earth System Research (UH-EL-INAR)*

11:15-12:30 - Session I: Introduction of newly joined Partners/Organizations (chaired by *Hanna K. Lappalainen, Alexander Mahura*)

- **11:15 (P02)** – Institute of Ionosphere research and educational activities – by *Alena Yelisseeva* ([yelisseyevaa\(at\)ionos.kz](mailto:yelisseyevaa@ionos.kz)) & *Tatiana Dedova* ([dedova\(at\)ionos.kz](mailto:dedova@ionos.kz)), *Institute of Ionosphere, Kazakhstan Academy of Sciences (IoI KAS), Kazakhstan*
- **11:30 (P03)** – Research and educational activities at the Department of Atmospheric Physics at CUNI – by *Tomas Halenka* ([tomas.halenka\(at\)mff.cuni.cz](mailto:tomas.halenka@mff.cuni.cz)), *Charles University in Prague (CUNI), Czech Republic*
- **11:45 (P04)** – Urban Climate Risks in Northern Cities: Research and Educational Activities at NERSC – by *Victoria Miles* ([victoria.miles\(at\)nersc.no](mailto:victoria.miles@nersc.no)), *Nansen Environmental and Remote Sensing Center (NERSC), Norway*
- **12:00 (P05)** – Research and Education in the field of Earth and Environmental Sciences at the O.M. Beketov National University of Urban Economy in Kharkiv, Ukraine – by *Yuri Vergeles* ([yuriy.vergeles\(at\)kname.edu.ua](mailto:yuriy.vergeles@kname.edu.ua)), *O.M. Beketov National University of Urban Economy in Kharkiv (NUUEK), Ukraine*
- **12:15 (P06)** – Complexity Science Meets Earth System – by *Jingfang Fan* ([jingfang\(at\)bnu.edu.cn](mailto:jingfang@bnu.edu.cn)), *School of Systems Science, Beijing Normal University University (BNU), China*

12:30-12:45 - coffee/ tea break (15 minutes)

12:45-14:15 - Session II: Introduction of newly joined Partners/Organizations (chaired by *Hanna K. Lappalainen, Alexander Mahura*)

- **12:45 (P07)** – On Recent Advancements in Atmospheric and Air Quality Monitoring – by *Tuukka Petaja* ([tuukka.petaja\(at\)helsinki.fi](mailto:tuukka.petaja@helsinki.fi)), *University of Helsinki, Institute for Atmospheric and Earth System Research (UH-INAR), Finland*
- **13:00 (P08)** – On the gap of science policy for air quality: Environmental Geochemistry and Atmospheric Research, IDAEA-CSIC – by *Xavier Querol* ([xavier.querol\(at\)idaea.csic.es](mailto:xavier.querol@idaea.csic.es)), *Spanish National Research Council (CSIC), Spain*

- **13:15 (P09)** – Towards interactive carbon cycle in ICON Earth System Model – by *Georgii Nerobelov* ([gnero\(at\)bgc-jena.mpg.de](mailto:gnero(at)bgc-jena.mpg.de)), *Max-Planck Institute for Biogeochemistry (MPI-BioGeoChem), Germany*
- **13:30 (P10)** – Research and knowledge transfer activities at FiBL – by *Tetiana Grabovska* ([tetiana.grabovska\(at\)fibl.org](mailto:tetiana.grabovska(at)fibl.org)), *Research Institute of Organic Agriculture (FiBL), Switzerland*
- **13:45 (P11)** – Synthesis of the Horizon Projects implemented at MeteoRomania – by *Sorin Cheval* ([sorin.cheval\(at\)meteoromania.ro](mailto:sorin.cheval(at)meteoromania.ro)), *National Meteorological Administration (NMA-Romania), Romania*
- **14:00 (P12)** – Mission and projects of the Climate, Atmosphere and Water Research Institute at Bulgarian Academy of Sciences – by *Ekaterina Batchvarova* ([Ekaterina.Batchvarova\(at\)cu.bas.bg](mailto:Ekaterina.Batchvarova(at)cu.bas.bg)), *Climate, Atmosphere and Water Research Institute - Bulgarian Academy of Sciences (CAWRI-BAS), Bulgaria*

14:15-14:30 - coffee/ tea break (15 minutes)

14:30-15:00 - Session III: Introduction of newly joined Partners/Organizations (continued)
(chaired by *Hanna K. Lappalainen, Alexander Mahura*)

- **14:30 (P13)** – What is going on in applied mathematics in Saarland? – by *Andreas Rupp* ([andreas\(at\)rupp.ink](mailto:andreas(at)rupp.ink)), *Saarland University (UdS), Germany*
- **14:45 (P14)** – Air Quality Modelling at AUTH/SEL – by *George Tsegas* ([gtsegas\(at\)auth.gr](mailto:gtsegas(at)auth.gr)), *Aristotle University of Thessaloniki (AUTH), Greece*

15:00-15:30 - Discussions on the PEEC COST Action proposal & Wrap-up

ANNEX 2: DETAILED Agenda of the PEEC-seminar on 9th April 2026

Schedule of the PEEC online seminar on 9 April 2026:

10:50-11:00 - Welcome and Short Introductory to PEEC

11:00-12:30 - Session I: Invited talks from PEEC Partners/Organizations

12:30-12:45 - coffee/ tea break (15 minutes)

12:45-14:15 - Session III: Invited talks from PEEC Partners/Organizations

14:15-14:30 - coffee/ tea break (15 minutes)

14:30-16:30 - Session III: Invited talks from PEEC Partners/Organizations

16:30-17:00 - Wrap-up, next steps, discussions on the PEEC COST Action proposal & Wrap-up

10:50-11:00 – Welcome and Short Introductory to PEEC - by *Hanna K. Lappalainen* ([hanna.k.lappalainen\(at\)helsinki.fi](mailto:hanna.k.lappalainen(at)helsinki.fi)), *University of Helsinki, Institute for atmospheric and Earth System Research (UHEL-INAR)*

11:00-12:30 - Session I: Invited talks from PEEC Partners/Organizations
(chaired by *Alexander Baklanov, Tareq Hussein*)

- **11:00 (T01)** – Integrated systems and analysis of urban Mobility for climate-neutral and susTainable Cities in Europe and China (IMTECC) – by *Alexander Baklanov* ([abaklanov\(at\)nbi.ku.dk](mailto:abaklanov(at)nbi.ku.dk)), *University of Copenhagen, Niels Bohr Institute (UCPH-NBI), Denmark*

- **11:15 (T02)** – Scenario-Based and Climate-Adjusted Projections of PM_{2.5} and SO₂ to 2050: Chemical Transport Modelling Evidence from Western Kazakhstan – by *Vitaliy Salnikov*

([vitali.salnikov\(at\)kaznu.edu.kz](mailto:vitali.salnikov@kaznu.edu.kz)), Al-Farabi Kazakh National University (KazNU), Kazakhstan

- **11:30 (T03)** – Meteorological and climatic research at Taras Shevchenko National University of Kyiv – by *Olga Schevchenko ([shevchenko_olga\(at\)knu.ua](mailto:shevchenko_olga@knu.ua))*, Taras Shevchenko National University of Kyiv (TSNUK), Ukraine
- **11:45 (T04)** – Renewable energy - Integrated master program at the Arctic University of Norway - by *Igor Ezau ([igor.ezau\(at\)uit.no](mailto:igor.ezau@uit.no))*, The Arctic University of Norway, Norway /video-recording/
- **12:00 (T05)** – Overview of EC-Earth activities within the PEEEX modeling platform – by *Risto Makkonen ([risto.makkonen\(at\)fmi.fi](mailto:risto.makkonen@fmi.fi))*, Finnish Meteorological Institute (FMI), Finland
- **12:15 (T06)** – Seamless modeling studies of aerosol-meteorology interactions at the Ukrainian Hydrometeorological Institute – by *Mykhailo Savenets ([savenets\(at\)uhmi.org.ua](mailto:savenets@uhmi.org.ua))*, Ukrainian Hydrometeorological Institute (UHMI), Ukraine

12:30-12:45 - coffee/ tea break (15 minutes)

12:45-14:00 - Session II: Invited talks from PEEEX Partners/Organizations
(chaired by *Alexander Baklanov, Tareq Hussein*)

- **12:45 (T07)** – Forest data science and IoT in the times of AI - paradigm shifts in research and education – by *Steffen Manfred Noe ([steffen.noe\(at\)emu.ee](mailto:steffen.noe@emu.ee))*, Estonian University of Life Sciences (EULS), Estonia
- **13:00 (T08)** – Integrating Climate Education in Agricultural Curricula: Institutional Mission and Capacity Building – by *Tetyana Dyman ([tetyanadyman\(at\)gmail.com](mailto:tetyanadyman@gmail.com))*, Bila Tserkva National Agrarian University (BTNAU), Ukraine /video-recording/
- **13:15 (T09)** – How climate change affects Intangible Heritage: The case of Catalan human towers – by *Jon Xavier Olano Pozo ([jonxavier.olano\(at\)urv.cat](mailto:jonxavier.olano@urv.cat))*, Universitat Rovira i Virgili (URV), Spain
- **13:30 (T10)** – Air quality monitoring using low-cost sensors network in Amman city in Jordan – by *Khaled Hazaymeh ([khazaymeh\(at\)yu.edu.jo](mailto:khazaymeh@yu.edu.jo))*, Yarmouk University (YU), Jordan
- **13:45 (T11)** – The DSP: the Digital Sustainable Development Goals Programme – by *Yubao Qiu ([qiuyb\(at\)radi.ac.cn](mailto:qiuyb@radi.ac.cn))/ Xiaoting Li ([lixt\(at\)aircas.ac.cn](mailto:lixt@aircas.ac.cn))*, Digital Belt and Road Program (DBAR), and the International Research Center of Big Data for Sustainable Development Goals (CBAS), Chinese Academy of Sciences (CAS), China
- **14:00 (T12)** – Mechanism and Technology Application of Non-Uniform Environment Creation in Large Public Buildings – by *Yu Zhao ([zhaoyu1220\(at\)dlut.edu.cn](mailto:zhaoyu1220@dlut.edu.cn))*, Dalian University of Technology (DLUT), China

14:15-14:30 - coffee/ tea break (15 minutes)

14:30-16:30 - Session III: Invited talks from PEEEX Partners/Organizations
(chaired by *Alexander Baklanov, Tareq Hussein*)

- **14:30 (T13)** – International Collaboration: AISUS+ Initiative: AI-Empowered Climate and AQ System for Urban Sustainability and Climate Resilience – by *Xu Tang ([tangxu\(at\)fudan.edu.cn](mailto:tangxu@fudan.edu.cn))*, Fudan University (FDU), China
- **14:45 (T14)** – PM10 Concentrations in Istanbul: A Comparative Analysis of 2024 and 2025 – by *Hüseyin Toros ([toros\(at\)itu.edu.tr](mailto:toros@itu.edu.tr))*, Istanbul Technical University (ITU), Türkiye
- **15:00 (T15)** – Fast-track futures: bridging education and work – by *Anda Paegle ([anda.paegle\(at\)lu.lv](mailto:anda.paegle@lu.lv))* & *Inga Skendere ([inga.skendere\(at\)lu.lv](mailto:inga.skendere@lu.lv))* Latvia University (LU), Latvia

- **15:15 (T16)** – Persistent Low-Water Phase of Major Ukrainian Rivers Flowing into the Northwestern Black Sea under Ongoing Climate Change – by *Valeriya Ovcharuk* (valeriya.ovcharuk@gmail.com), *Mechnikov Odessa National University (ONU)*, Ukraine
- **15:30 (T17)** – Beyond Individual Projects: Odesa Polytechnic National University as a Hub for the Development of Transdisciplinary R&D Clusters – by *Oleh Shablii* ([shablii.o.v\(at\)op.edu.ua](mailto:shablii.o.v(at)op.edu.ua)), *Odesa Polytechnic National University (OP)*, Ukraine
- **15:45 (T18)** – Regional scale modelling for Europe: towards climate and air quality modelling convergence – by *Sandro Finardi* ([s.finardi\(at\)aria-net.it](mailto:s.finardi(at)aria-net.it)), *ARIANET Srl*, Italy
- **16:00 (T19)** – High Latitude Dust research: from observations to impacts on climate and society – by *Pavla Dagsson-Waldhauserova* ([pavla\(at\)lbhi.is](mailto:pavla(at)lbhi.is)), *Agricultural Univ of Iceland (AUI)*, Iceland /video-recording/
- **16:15 (T20)** – Development and application of atmospheric transport models for assessing radioactively contaminated sites: experience of IMMSP – by *Ivan Kovalets* ([ivkov084\(at\)gmail.com](mailto:ivkov084(at)gmail.com)), *Institute of Mathematical Machines and Systems Problems (IMMSP)*, Ukraine

16:30-17:00 - Discussions on the PEE X COST Action proposal & Wrap-up

ANNEX 3: DETAILED Agenda of the PEE X-seminar on 14th April 2026

Schedule of the PEE X hybrid seminar on 14 April 2026:

- 10:30 Session I: Welcome & Opening words, PEE X program overview
 10:50 Session II-A: Invited presentations (TWAS, UNEP)
 11:20 *Coffee/ Tea Break (5 min)*
 11:25 Session II-A: Invited presentations / RI-URBANS, CRiceS, FOCI
 12:10 *Lunch (for onsite participants)*
 13:00 Session II-B: Invited presentations / China collaboration, ERASMUS+ educational projects, PEE X COST Action proposal)
 13:45 Wrap-up & Discussion & Next Steps
 14:00 End of the PEE X seminar

10:30-10:50 - Session I: General Information (20 min)

(chaired by Hanna K. Lappalainen, Alexander Mahura)

- 10:30-10:50** – Welcome words, Grand Challenges – by *Markku Kulmala*, onsite, ([markku.kulmala\(at\)helsinki.fi](mailto:markku.kulmala(at)helsinki.fi)), *University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR)*, Helsinki, Finland
PR1

10:50-12:10 - Session II-A: Invited presentations (80 min)

(chaired by Markku Kulmala)

- 10:50-11:05** – Building Scientific Capacity in the Global South for Climate Justice – by *Max Paoli*, onsite, ([mpaoli\(at\)twas.org](mailto:mpaoli(at)twas.org)), *The World Academy of Sciences - UNESCO, The World Academy of Science (TWAS)*
PR2
11:05-11:20 – Eye on Methane: From Measurement to Momentum– by *Xuefei Li*, onsite, ([xuefei.li\(at\)un.org](mailto:xuefei.li(at)un.org) / [xuefei.z.li\(at\)helsinki.fi](mailto:xuefei.z.li(at)helsinki.fi)), *Agriculture Sector Lead, UNEP's International Meth-ane Emissions Observatory*

PR3

11:20-11:25 – **Coffee/ Tea Break (5 min)**

11:25-11:40 – Summary of recently completed RI-URBANS project on observational/ measurement activities – by *Xavier Querol*, online, ([xavier.querol\(at\)idaea.csic.es](mailto:xavier.querol@idaea.csic.es)), Spanish National Research Council (CSIC), Barcelona, Spain

PR4

11:40-11:55 – Summary of recently completed CRiceS project on modelling activities – by *Risto Makkonen*, onsite, ([risto.makkonen\(at\)fmi.fi](mailto:risto.makkonen@fmi.fi)), Finnish Meteorological Institute (FMI), Helsinki, Finland

PR5

11:55-12:10 – Summary of ongoing FOCI project – by *Tomas Halenka*, online, ([tomas.halenka\(at\)mff.cuni.cz](mailto:tomas.halenka@mff.cuni.cz)), Charles University (CUNI), Prague, Czech Republic

PR6

12:10-13:00 – **Lunch (about 1 hour) for onsite participants**

13:00-14:00 - Session II-B: Invited presentations (60 min)

(chaired by Hanna K. Lappalainen, Alexander Mahura)

13:00-13:15 – Overview on recent research at Fudan University for the PEEEX domain – by *Bo Yao*, online ([yaobo\(at\)fudan.edu.cn](mailto:yaobo@fudan.edu.cn)), Department of Atmospheric and Oceanic Sciences, Fudan University, Shanghai, China

PR7

13:15-13:25 – Educational activities in Erasmus+ CLUVEX/ UnaVEx/ ClimEd projects – virtual exchanges/ trainings for Climate Messengers, Climate Advocates, Climate Experts – by *Alexander Mahura*, onsite ([alexander.mahura\(at\)helsinki.fi](mailto:alexander.mahura@helsinki.fi)) University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

PR8a

13:25-13:30 – ClimEd - Building capacity for climate services in Ukraine – by *Svyatoslav Tyuryakov*, onsite, ([svyatoslav.tyuryakov\(at\)helsinki.fi](mailto:svyatoslav.tyuryakov@helsinki.fi)), University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

PR8b

13:30-13:45 – COST Action PEEEX-EU-NEN-ReN “Pan-Eurasian EXperiment – Europe – Near Europe Neighbourhood countries Earth System Research Network” – by *Hanna K. Lappalainen & Alexander Mahura*, onsite, ([hanna.k.lappalainen\(at\)helsinki.fi](mailto:hanna.k.lappalainen@helsinki.fi) & [alexander.mahura\(at\)helsinki.fi](mailto:alexander.mahura@helsinki.fi)), University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland

PR9

13:45-14:00 – **Wrap-up & Discussions & Next Steps (15 min)**

14:00 – End of the PEEEX Seminar

**Plenary Talk by Academician Markku Kulmala
(hybrid : onsite/online) at the ACCC Impact Week (15 April 2026)**

Date Wednesday, 15 April 2026
Time: 09:00-10:10 of Helsinki time

09:15-10:10 – Global environmental grand challenges (EGCs) and the need of comprehensive open data with proper metadata and open science to meet the EGCs – *by Markku Kulmala, onsite, ([markku.kulmala\(at\)helsinki.fi](mailto:markku.kulmala(at)helsinki.fi)), University of Helsinki, Institute for Atmospheric and Earth System Research (UHEL-INAR), Helsinki, Finland*

**ANNEX 4: List of participants attended a series of PEEEX e-seminars
on 1, 9, and 14 April 2026**

Attendees on 1st April 35
Attendees on 9th April 40
Attendees on 14th April 44
Attendance by different participants 80

#	1 Apr	9 Apr	14 Apr		Name	Surname	Country
1	X	X	X	1	MARKKU	KULMALA	Finland
2	X	X	X	1	HANNA K.	LAPPALAINEN	Finland
3	X	X	X	1	TUUKKA	PETÄJÄ	Finland
4	X	X	X	1	ALLA	BORISOVA	Finland
5	X	X	X	1	ALEXANDER	MAHURA	Finland
6	X	X	X	1	MYKHAILO	SAVENETS	Ukraine
7	X	X	X	1	OLGA	SHEVCHENKO	Ukraine
8	X	X	X	1	TAREQ	HUSSEIN	Finland
9		X		1	HASMIK	MOVSESYAN	Armenia
10	X	X	X	1	VALERIYA	OVCHARUK	Ukraine
11	X	X	X	1	HUSEYIN	TOROS	Turkiye
12		X		1	KHALED	HAZAYMEH	Jordan
13		X	X	1	TETYANA	DYMAN	Ukraine
14	X	X	X	1	SORIN	CHEVAL	Romania
15	X		X	1	ANDREAS	RUPP	Germany
16		X		1	JON XAVIER	OLANO POZO	Spain

17	X	X	X	1	ALENA	YELISSEYEVA	Kazakhstan
18	X	X	X	1	TATYANA	DEDOVA	Kazakhstan
19	X	X	X	1	LARISSA	BALAKAY	Kazakhstan
20	X			1	VICTORIA	MILES	Norway
21	X	X	X	1	GEORGE	TSEGAS	Greece
22	X	X	X	1	SANDRO	FINARDI	Italy
23			X		Mariana	Salgado	
24			X	1	Outi	Meinander	Finland
25	X	X	X	1	ALEXANDER	BAKLANOV	Denmark
26			X		Roseline	Thakur	Finland
27			X	1	Henry	Antosalo	
28			X	1	Kaisa	Kurki	Finland
29			X	1	Max	Paoli	
30			X	1	Selena	Verha	Finland
31			X	1	Xuefei	Li	Finland
32			X	1	Seppo	Vainio	Finland
33			X		Hannakaisa	Lindqvist	Finland
34			X		Lauri	Linna	
35			X	1	Andrea C.	Wagner	Finland
36	X	X	X	1	GULSHAT	SAGATDINOVA	Kazakhstan
37	X		X	1	ROMAN	NUTERMAN	Denmark
38		X		1	Pavla	Dagsson-Waldhauserova	Iceland
39		X		1	IGOR	EZAU	Norway
40		X	X	1	VITALIY	SALNIKOV	Kazakhstan
41	X	X	X		SVETLANA	POLYAKOVA	Kazakhstan
42	X	X	X		GULNUR	MUSRALINOVA	Kazakhstan
43	X	X	X	1	GULNAR	ORAKOVA	Kazakhstan
44	X	X	X	1	TETIANA	GRABOVSKA	Switzerland
45	X	X		1	IVAN	KOVALETS	Ukraine
46			X		Anita	Seppä	Finland
47			X		Tuuli	Hakala	Finland
48			X	1	Joni	Kujansuu	Finland
49			X		Jiaxin	Xu	Finland
50			X		Sania	Sabir	Finland
51			X		Antti	Aromäki	Finland
52	X	X	X	1	VOLODYMYR	NOCHVAI	Ukraine

53		X		1	YU	ZHAO	China
54			X		Emma	Yrjölä	
55			X		Ari	Karppinen	Finland
56		X	X	1	Yubao	Qiu	China
57			X		Syed Ashraful	Alam	Finland
58	X		X	1	Xiaoting	Li	China
59			X		Niko	Nummela	Finland
60	X	X			SVITLANA	HORNOVSKA	Ukraine
61	X			1	GEORGII	NEROBELOV	Germany
62	X		X	1	JINFANG	FAN	China
63		X		1	XU	TANG	China
64	X	X		1	DARIA	HRAMA	Ukraine
65	X	X		1	MARYNA	RUDAS	Ukraine
66			X	1	Lukas	Kohl	Finland
67			X		Anneli	Pauli	Finland
68	X	X	X	1	RISTO	MAKKONEN	Finland
69	X	X		1	YURIY	VERGELES	Ukraine
70	X		X	1	Xavier	QUEROL	Spain
71			X		Andrew	Twelves	Finland
72			X		Ulla Paaso	Umaste	
73		X	X	1	Mikko	Strahlendorff	Finland
74			X		Christina	Williamson	Finland
75			X	1	Katja	von Brandenburg	Finland
76	X	X	X	1	Bleona	Silaj	
77			X	1	Heikki	Haario	Finland
78	X	X	X	1	EKATERINA	BATCHVAROVA	Bulgaria
79	X		X	1	TOMAS	HALENKA	Czechiya
80	X	X		1	MIKKO	KULMALA	Finland
81	X			1	Putian	Zhou	Finland
82	X			1	Jun	Meng	China
83		X		1	Oleh	Shablii	Ukraine
84		X		1	Kateryna	Husieva	Ukraine
85			X	1	Antti	Hyvärinen	Finland
86			X	1	Xuemeng	Chen	Finland
87			X		Matti	Juntti	Finland
88			X	1	Michael	Boy	Finland

89			X	1	Pauli	Paasonen	Finland
90			X	1	Janne	Mukkala	Finland
91			X	1	Yann	Salmon	Finland
92			X		Julia	Johansson	Finland
93			X		Joachim	Jansen	Finland
94		X		1	Adeeb	Ktaish	
95		X		1	Enes	Birinci	Türkiye
96		X		1	Ipek	Alpak	Türkiye
97		X		1	Eda	Özbent	Türkiye
98		X	X	1	Rabia Nida	Sofu	Türkiye
99		X			Mustafa Yasin	Erdoğan	Türkiye
100		X			STEFFEN	NOE	Estonia
101		X			ANDA	PAEGLE	Latvia
102		X			Xiaoting	Li	China
103			X	1	BO	YAO	China
104			X	1	Sofia	Marina	
105			X	1	Silja	Hame	Finland
106			X	1	Yuan	Zhang	Finland
107			X	1	Florencia	Quesada-Avendano	Finland