



UNDER THE SPOTLIGHT

Greetings from the Acting Director

[Mauro Scavo](#)

Dear Colleagues, this is my second time in the ISP newsletter, and probably the last, given the change scheduled from 1 February 2025: from the introductory greetings I therefore move directly to the final balance. It largely was a positive experience, and from each of you I learned small or large life lessons that enriched me, even if it wasn't easy either for you or for me to try not to lose the way amidst the winds, waves and currents which, in the mare nostrum, have sometimes contradicted the laws of physics and often those of common sense. I have tried to be intellectually honest with you and not hide behind a title or role which, as mentioned last time, is intended to be a role of service to those who carry out research activities on a daily basis.

I also learned something about your activities, especially those conducted in the field, which as a wave modelist I had only occasionally encountered. I saw first-hand the logistical effort and sacrifice behind every measure conducted in extreme environments, and I re-evaluated the value of the data. I wish Prof. Giuliana Panieri to be able to make the most of your talents and sacrifices.

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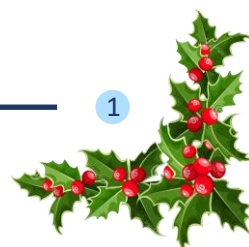
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REPORT

1 - 61st Ny-Ålesund Science Managers Committee (NySMAC) Meeting

[Mauro Mazzola](#), [Andrea Spolaor](#), [Federico Giglio](#), [Francesca Spataro](#), [Chiara Ripa](#), and [Giulio Verazzo](#)

On October 21st and 22nd, the Institute of Polar Sciences hosted the 61st NySMAC (Ny-Ålesund Science Managers Committee) meeting at the Marconi Hall of the CNR Headquarters in Rome. NySMAC is an organization established in 1994 to improve collaboration between researchers and coordinate and support the logistical needs of research activities carried out in Ny-Ålesund (Svalbard Islands, Norway).

The meeting was attended by the company responsible for logistics management of the village, Kings Bay, representatives of various research institutions present in the village such as Norway, Germany, India, Sweden, Korea, China and Japan, as well as the Managers of the Italian Arctic Base 'Dirigibile Italia' of CNR.



Over two days, different technical-scientific and logistical issues were addressed, aimed at ensuring correct performance of the research and monitoring activities carried out in Ny-Ålesund. Issues related to the development and/or maintenance of infrastructures in the same area were also discussed. In this context, the NySMAC members considered as priorities for the near future, the restoration of the old pier overlooking the fjord, the implementation or rather the replacement of the MS Teisten ship considered now insufficient for the research

activities that need to be conducted and the improvement of the Gruvebadet infrastructure on the basis of various requests for new monitoring activities received by Kings Bay.

As a side meeting of NySMAC, on October 23rd a workshop was held during which the participants discussed monitoring activities taking place in Ny-Ålesund. The discussion focused on two main topics. The first topic concerned the collection of long time series of data and their possible public availability. In this context, the main environmental parameters that are useful to all in their research activities, and critical issues related to access and availability of monitoring data, were examined. The second topic concerned the strategies for the development of an integrated monitoring program for Ny-Ålesund.

2 - 1st International Workshop on Biodiversity in Svalbard Archipelago: state of the art and perspectives

[Maria Papale](#) and [Gabriella Caruso](#)

From October 28 to 30, 2024, the Institute of Polar Sciences (CNR) in Messina hosted the 1st International Workshop on Biodiversity in the Svalbard Archipelago. This event brought together leading experts and researchers to discuss the current state of knowledge on Svalbard's biodiversity and outline strategies to address the challenges posed by climate change and anthropogenic pressures. Over three days, participants shared insights and findings on marine, freshwater, and terrestrial environments.



The event focused on several key themes, including monitoring the impacts of climate



Prof. K. Bischof, from Bremen University, discusses pollution in Svalbard Areas. Credits: G. Di Leo.

change, identifying biological indicators useful for studying environmental shifts, and exploring emerging technologies for biodiversity analysis in extreme environments. Critical knowledge gaps



Prof. G. Wing Gabrielsen, Norwegian Polar Institute (NPI) and Prof. at the Svalbard University, discussing biodiversity in Svalbad. Credits: G. Di Leo.

were also examined, such as the lack of long-term monitoring data, limited spatial and temporal coverage of available datasets, and the absence of standardized protocols for sampling and analysis. Participants engaged actively in working groups to emphasize essential recommendations for the future of research and conservation of biodiversity. Among the main proposals were the development of long-term monitoring programs, the standardization of research methods, and the promotion of a holistic approach to understanding species dynamics and their interactions with ever-changing habitats. The importance of strengthening international cooperation and involving local communities and stakeholders

through citizen science initiatives and educational programs was also highlighted. The workshop offered a crucial opportunity to define future research priorities, including adopting advanced technologies for data acquisition and analysis, classifying ecosystem health, and identifying effective strategies to mitigate the effects of pollution and anthropogenic pressures. Additional recommendations were made to promote eco-tourism practices and policies aimed at preserving the unique ecosystems of Svalbard.



Participants at the 1st International workshop on Biodiversity in Svalbard. Credits: G. Di Leo.

The Institute of Polar Sciences (CNR) in Messina is proud to have hosted this event, contributing to strengthening the international scientific network, promoting sustainability and protecting one of the planet's most fragile ecosystems. The workshop outcomes provide a solid foundation to tackle future challenges and ensure a balance between conservation and sustainable development in the Arctic.



Organizing committee of the 1st International workshop on Biodiversity in Svalbard. Credits: G. Di Leo.

3 – The Workshop “Microplastic emergency and the associated plastisphere in freshwater habitats of the Arctic”

[Angelina Lo Giudice](#) and [Maurizio Azzaro](#)

Microplastic pollution is of great environmental concern. Microplastics have been found all over the Earth, which is indicative for the important threat they constitute. Yet, while the ocean is object of major interest, the data available in the literature about microplastic pollution in the freshwaters, including those of the Earth's poles, are limited to few reports, questioning the transport patterns through which microplastics reach these remote areas. Microplastics can indeed be ingested by animals and can physically damage their digestive tracts, as well as escalate the trophic levels down to indigenous people. Microplastics can also alter microbial community biodiversity and functions by serving as surfaces onto which microbes (including pathogens) can grow and develop (plastisphere), and can enhance ice melting when trapped in glaciers. Plastic-attached microbes could be also capable of degrading plastic polymers, thus altering the buoyancy of polymers and the toxicity of plastics. In turn, the ability to degrade plastics by cold-adapted microorganisms could lead to an environmental-friendly solution in mitigating plastic pollution in cold environments.



Credits: G. Di Leo.

In this context, an international in-person trans-disciplinary workshop was held in Messina (Italy) last October, involving about 35 scientists. It was endorsed by the [International Arctic Science Committee \(IASC\)](#) and received funding by the Italian Arctic Research Program ([PRA](#)) for its organization.



Credits: G. Di Leo.

The workshop allowed gaining relevant information to take actions in thwarting plastic pollution in Arctic freshwaters (e.g., snow, glaciers, lakes and rivers), along with a focus on the plastisphere. The outcomes of the workshop will be shared with [ICARP IV](#) for implementation and presented during the ICARP IV Conference in Boulder (Colorado, USA) next March 2025. The Workshop was hosted by the [Parco Horcynus Orca](#) in Capo Peloro (Messina, Italy).



Credits: G. Di Leo.

Tags #FondazioneMessina #microplastics #freshwater

NEWS FROM DIRIGIBILE ITALIA

[Mauro Mazzola](#)

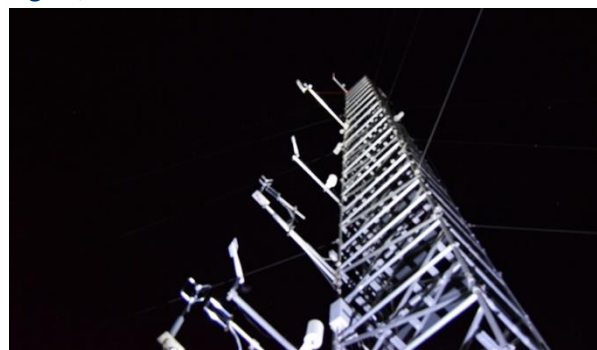
In the darkness of the Arctic night, monitoring activities carried out by our base continue. For a few days now, the station leader Tessa Viglezio has been joined by her new colleague **Anna Baldo** who



will work alongside her for the month of December, before taking over as base leader in the first days of January. These are her first impressions:

“Both the base and the community of Ny-Ålesund are truly welcoming. The base is both an accommodation and a working environment and, little by little and with Tessa’s patient guidance, I am discovering how to get into it and how to make both the structure and the instruments work properly. I have already seen how certain monitoring activities are carried out in collaboration with other institutions, hence the great harmony that develops among the permanent residents of the village. In Ny-Ålesund, many free-time initiatives are organized to bring the inhabitants together, including courses or

seminars of a more scientific nature, sports activities or preparations for Christmas: I really believe that this night, crowned with stars and streaked by the dancing skirts of the Northern Lights, will not be so dark at all.”



The Climate Change Tower in the polar night.

The year that is coming to an end has seen 90 researchers access our base, for a total of about 1500 man-days, who have worked on 33 research projects. With next year in view, the Italian call for 2025 activities has just been published and we hope to have numerous requests this coming year too, especially for new activities that have not yet taken place at the base. The call for transnational access promoted by the European project [POLARIN](#), in which our base is participating together with the other Italian polar infrastructures (the two stations in Antarctica and the Laura Bassi ship), also closed at the end of November. Thanks to initiatives of this kind, researchers from all over the world can receive funding to carry out their activities at our base. Finally, among the preparations for the 2025 season there is also the renewal of the agreement with the Guardia di Finanza Alpine Rescue unit, which will continue to support researchers in the field and will guarantee their safety.



RESEARCH HIGHLIGHTS

1 - In the presence of giants: tale of a (failed) scientific expedition at the foot of K2

Jacopo Gabrieli

Introduction

The White Lady descended last night upon the vast Concordia amphitheater. From our tent, we peer out at the majestic silhouettes of Broad Peak and the Gasherbrum mountains, starting to emerge in the pale light of sunrise. His Majesty K2, however, remains concealed, shrouded in a dense blanket of clouds. The clatter of pots from the kitchen mingles with the braying of mules ready to depart, already burdened with gears and fatigue. For days, we've been trekking along the Baltoro Glacier, on a journey stretched out in both time and space. The mind wanders impatiently, rehearsing a meticulous list of the scientific activities to be carried out atop the Godwin-Austin Glacier.



K2 towering above the Godwin-Austin glacier; the base camp is visible in the bottom left, while the summit plateaus intended for drilling are faintly seen in the top right. Credits: J. Gabrieli.



Marching along the edge of the crevasse field on the Godwin-Austin. Credits: J. Gabrieli.

The goal of our expedition is to drill and sample

the uppermost layers of the glacier, attempting to uncover their story, one that narrates the climatic and environmental changes that have unfolded in recent years among the highest peaks of the Karakoram. Meanwhile, all around us, ancient



Drilling camp on the summit plateaus of the Godwin-Austen (6,000m). Credits: J. Gabrieli.

sounds, images, gestures, and scents abound. Here, everything seems to have frozen in time. We linger, carefully organizing the corer and other scientific instruments.



Surface drilling with a manual corer. Credits: J. Gabrieli.

Perhaps it's the thin air. Or maybe it's the awe, the reverence, of being here, finally standing before them, ready to request an audience. With the last sip of hot coffee, we swallow our anxiety as well.



Credits: J. Gabrieli.

By now, the summit of K2 has revealed itself too, radiant amidst the lenticular clouds. Backpack on, we gaze at it, wondering if it will be merciful. But

really, still imagining we can understand the rules of the game? Naïve, arrogant, small humans...

With a smile, Riaz signals that it's time to move. *Inshallah*, we should finally reach base camp by lunchtime. *Inshallah*...



Credits: J. Gabrieli.

Epilogue

Mind and heart are a whirlwind of thoughts and emotions as we descend slowly through the treacherous crevasse-ridden terrain back to base camp in the dark of night. The roar of the serac collapse still echoes in our heads. Neither the elevated position of the remote camp nor the distance from K2's majestic East Face prevented the air blast and debris from reaching our tents and equipment, damaging and scattering them. Stunned, battered but alive, we salvage the few essential materials from the avalanche debris and begin the long trek back, silent, each lost in their own thoughts.



The aftermath of the avalanche caused by a serac collapse from the summit of K2's East Ridge

I watch Ali and Nazir walking ahead of us: their steps are sure, swift, and precise, almost bored as they navigate this terrain, which to me is unpredictable, never to be taken for granted. Tattered jackets, broken rubber shoes, no crampons, no headlamps.



...there is nothing left to do but abandon the remote camp and return to base camp at night... Credits: J. Gabrieli.

They walk with their senses, immersed in an intimate connection between a small human and the vast glacier. It's an empathy that develops slowly, a bond that cannot be taught or explained. For them, it's simply life.

Minutes of silence stretch into hours, with only the crunching of snow under our boots as the soundtrack. And so the mind, step by step, begins to fade, merging with the ice we touch with bare hands, surrounded by glaciers on all sides. Layer by layer, we caress the history of these places, listening to their stories.

A glacier is a fantastic book, written in a language we can only partially understand. Molecules and elements trapped in the ice are silent witnesses of distant eras, telling tales of a climate long buried by time. One day, this ice will reveal its hidden secrets to us. One day, it will recount its past, showing us even more clearly the urgency of bold actions in our present. One day, it will speak.

One day, yes, but not today...

3 - GAIA: How Aerosols Influence the Arctic and Global Warming

[Angelo Lupi](#), [Giulia Calzolai](#), and [Mauro Mazzola](#)

The Arctic is warming much faster than the rest of the world, a phenomenon known as "Arctic Amplification" (AA), which is altering the ecosystem and influencing the global climate, making extreme weather events harder to predict. Despite progress in climate change modeling, uncertainties remain, particularly regarding aerosols. These particles affect the climate in complex ways, and the scarcity of data in Arctic



BEYOND THE POLES

Aboard the Gaia Blu: Research in the Adriatic Sea to Monitor Pollution and Climate Change

Luisa Patrolecco and Stefano Miserocchi

Between October and November, researchers from ISP Rome (Luisa Patrolecco and Nicoletta Calace, an ISP associate) and Bologna (Stefano Miserocchi, Francesca Battaglia, and Alessio Nogarotto) participated in two significant oceanographic campaigns aboard the R/V Gaia Blu in the southern Adriatic Sea and the Strait of Otranto.



The sediment core sampling team PER24.
Credits: L. Patrolecco

From October 18 to 28, the first mission took place within the framework of the "PER24 - Pollutants' Environmental Research" project, coordinated by IRBIM-CNR in collaboration with several universities and research institutes. The mission aimed to assess the impact of human activities on benthic marine ecosystems, with a particular focus on regulated and emerging organic contaminants, including perfluorinated compounds, pharmaceutical residues, plasticizers, and endocrine disruptors. ISP analyzed surface and

deep sediments to trace the transport of contaminants from coastal areas to deep marine regions, providing valuable insights for the improved management of human and climate-related impacts on marine ecosystems.



Sediment core section. Credits: L. Patrolecco.



The team of the PER24 oceanographic cruise. Credits: L. Patrolecco

From October 29 to November 6, the team participated in the "EMSO SA-2024" campaign, which focused on the E2M3A observatory site,

part of the Regional Facility South Adriatic of the European EMSO-ERIC network. The mission involved the maintenance of autonomous underwater sensors for the collection of hydrological and environmental data, continuing a long-term observation series that began in 2006.



The ISP team of the EMSO SA-2024 oceanographic cruise. Credits: S. Miserocchi

These data are critical for studying climate change and monitoring marine ecosystems. The campaign, coordinated by CNR-ISP Bologna, included contributions from OGS, ISMAR-CNR, and the British Antarctic Survey (BAS).



The ISP team of the EMSO SA-2024 oceanographic cruise at work. Credits: S. Miserocchi

These two campaigns underscore that ISP's scientific activities are not confined to polar regions: the protection of marine ecosystems is a global mission requiring science, innovation, and international collaboration.



The ship Gaia Blu anchored at the Port of Bari.



NEWS FROM ANTARCTICA

Credits: Papale©PNRA

Participation of ISP in the 40th PNRA expedition.

Mario Zucchelli Station (MZS)

- 2022/BZ3.01 PI: Warren Raymond Lee Cairns CNR-ISP
Potential Role of Sea Ice Change in Controlling Mercury in Coastal Antarctic Areas (PRIMAR)

The PRIMAR project (Potential Role of Sea Ice Change in Controlling Mercury in Coastal Antarctic Areas), through the sampling of sea ice, glacial ice, snow, and biota, aims to investigate the connections between these compartments and better understand their interactions. A novel aspect of the project is the investigation of the presence of the meroperon within the samples, which encodes for mercury resistance in bacteria. This is based on the hypothesis that biological processes become significant in mercury emissions from the sea surface after sea ice breaks up. By collecting aerosols and bioaerosols with equipment provided by the University of Perugia partner, the project aims to contribute significantly to understanding Antarctica's role in the global mercury cycle. During the mission, samples will also be collected for the Antarctic Biobank of the Genoa Antarctic Museum.

- 2022/BZ3.02 PI: Roberto Salzano CNR-IIA
Overview of the Supraglacial Lake-Ice-Snow Timing and Climate Causality (HOLISTIC) – CNR-ISP personell involved: Ademollo Nicoletta, Valentini Emiliana

The PNRA HOLISTIC project, involving CNR institutes (IIA and ISP), INGV, and IUSS, aims to deepen knowledge about supraglacial lake (SGL) dynamics and surface hydrology in the Nansen Ice Sheet area (Victoria Land, Antarctica). The seasonal evolution of snow cover, ice exposure, and surface water presence will form the basis for describing melt, runoff, and drainage processes associated with various meteorological-climatic feedbacks. The project employs an integrated strategy of combining satellite, aerial sensor, and in situ observational data. Researchers Emiliana Valentini and Nicoletta Ademollo from ISP will participate in the 40th Italian Antarctic Expedition at the MZS.

Foreign Platforms

- 2022/ES1.02 PI: Gabriella Caruso CNR-ISP

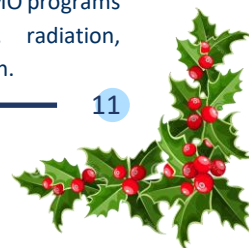
PlaSTic cOlonization in maRitime Antarctica as a challenge trEasure of Bioactive Molecules (STORAGE) - CNR-ISP personell involved: Maurizio Azzaro, Francesco Smedile

The STORAGE project focuses on the colonization of benthic environments in the South Shetland Islands (Deception and Livingston Islands) to explore the biodiversity and functional activity of organisms associated with micro and macro benthic biofilms, identifying their chemical interactions and exchange of bioactive molecules with antimicrobial, anti-fouling, and plastic-degrading properties. The South Shetlands provide an ideal setting to study environmental variables' effects on biofilm biological communities, thanks to diverse volcanic and non-volcanic marine ecosystems. In collaboration with Italian institutions (CNR, and the Universities of Salento, Messina, and Insubria) and the University of Barcelona, the project will analyze local marine biodiversity, comparing data with those from the previous ANT-Biofilm project in the Ross Sea. Bacterial strains and benthic invertebrates on plastics immersed for up to 12 months at Deception and Livingston will be collected and studied to identify biotechnologically relevant metabolites and enzymes using advanced microbiological, spectroscopic, and metagenomic techniques.

- 2022/ES3.01 PI: Mauro Mazzola CNR-ISP

Surface-Atmosphere Mass and Energy Exchanges at a Coastal Antarctic Site 2022 (SAMEECA-2022)

This project aims to improve understanding of mass and energy exchanges between the surface and atmosphere at a coastal Antarctic site in the Ross Sea. This will be achieved through continuous atmospheric parameter measurements and the development of a multiscale model, addressing crucial scientific questions for Antarctica and the Southern Ocean in the coming decades. Measurements will be carried out year-round at the Jang Bogo Research Station (JBS) in collaboration with the MZS. Led by the Korea Polar Research Institute, CNR, and UNIFI, the project will contribute to the Global Climate Observing System (GCOS) and WMO programs by providing valuable data on weather, radiation, atmospheric structure, and chemical composition.



POSTCARDS FROM THE FIELD

See you at the North Pole!

The North Pole close to home: the exhibition Arctic - An Interactive Journey to the North Pole stops at the Archaeological Museum of Bologna from January 16 to March 2, 2025.

Through multimedia installations, interactive experiments, scientific equipment, scale reconstructions, documents, objects, and evocative images, the exhibition guides visitors on a journey of discovery of the Arctic, its unique features, and the phenomena observed there.

The exhibition highlights the main research activities conducted by Italy in the Arctic, particularly in Ny-Ålesund, on the Svalbard Islands, home to our "Dirigibile Italia" research station.



ARTICO
Viaggio interattivo al Polo Nord

Mostra Scientifica interattiva ideata e realizzata dal Consiglio Nazionale delle Ricerche

Per prenotazioni www.bo.cnr.it/wp_artico
articomostra.cnr.it

In collaborazione con:
Bologna Museo Civico Archeologico
16 gennaio - 2 marzo 2025
Al via le prenotazioni!

Con il contributo scientifico di:
INAF
NOTTE EUROPEA DEI RICERCATORI
EUROPEAN NIGHT OF RESEARCHERS

Con il patrocinio di:
Comune di Bologna
Quartiere Sesto Sestiere
US
Città Metropolitana di Bologna

Hi everyone!

From mid-November to mid-December, we've been carrying out the field sampling campaign for the PRIMAR - Potential Role of Sea Ice change in controlling Mercury in coastal Antarctic Areas PNRA project. In the field are Warren Cairns CNR-ISP and Carmen Rizzo (SZN-SMC) with remote help from our partners at the University of Perugia. We have been busy sampling snow and ice from the Strandline glacier that feeds into Tethys Bay, together with sea ice and water from where the glacier meets the pack ice. Bioaerosol and the PM10 fraction of aerosol have also been sampled to understand the effect of the local microbial community on the biogeochemical cycle of mercury. The laboratories in the Italian base Mario Zucchelli have allowed us to carry out the first culture growth experiments in the presence of high concentrations of mercury, so the first mercury resistant strains will be ready once the samples arrive in Italy! Then the experimental work will begin in earnest.

Warren Carmen





UPCOMING EVENTS

- [ARTICO – Viaggio interattivo al Polo Nord](#), XI EDIZIONE DELLA MOSTRA – Bologna, 16 gennaio – 2 marzo 2025. La mostra Artico - Viaggio interattivo al Polo Nord fa tappa al Museo Archeologico di Bologna, dal 16 gennaio al 2 marzo 2025. [Prenotazioni aperte per le scuole](#)
- [SIOS Polar Night Week](#), 20-24 January 2025 (physical & virtual), Longyearbyen. This annual meeting brings the SIOS community together for science seminars, working group meetings and plenary discussions. Registration for virtual participation will be open until 4 days prior to PNW.
- The [2025 EGU General Assembly](#) will be held both on-site in Vienna, Austria, and virtually on 27 April–2 May 2025. The EGU General Assembly 2025 brings together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary, and space sciences. The EGU aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience. [The abstract submission](#) deadline is Wednesday, 15 January 2025, 13:00 CET. Apply for financial support by submitting your abstract by 2 December 2024, 13:00 CET.
- ECORD MagellanPlus Workshop: [NHIS Evolution of the Northern Hemisphere Ice Sheets: timing, drivers, and interconnections](#), 4-7 February 2025, Belfast, Northern Ireland. The workshop aims to explore synergies among different ocean drilling initiatives and ideas targeting the evolution of the Northern Hemisphere ice sheets, consolidate existing and develop new ideas and proposals to be submitted to [IODP](#)³, and to foster international collaborations among researchers and support Early Career Researchers' involvement in ocean drilling.
- [Arctic Science Summit Week \(ASSW\) 2025](#), Boulder, Colorado (USA), 20–28 March 2025. ASSW 2025 will be hosted as a hybrid event at the University of Colorado Boulder. The theme of ASSW 2025 is “Arctic Research Planning for the Next Decade” as it will include the Fourth International Conference on Arctic Research Planning (ICARP IV) Summit
- [Global Tipping Points](#), 30 June – 3 July 2025, University of Exeter, Streatham Campus, Exeter, Devon (UK). The conference is a ‘call to action’ to the research community, policymakers, and business to raise awareness and understanding of the importance of tipping points and to accelerate the required action. The programme will cover the latest developments in both negative and positive tipping points, at scales from local to global, and from theory to practice. It will consider the risks from climate tipping points and opportunities for positive tipping points for different regions, communities, sectors, and supply chains. Early registration: 6 Jan 2025 – 28 Feb 2025 (tbc).

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