

# INSTITUTE OF POLAR SCIENCES

## IN THIS ISSUE:

### Under the spotlight

*Greetings to Director Carlo Barbante*

### Report

*2° workshop of Institute of Polar Sciences*

### News from Dirigibile Italia

### Research Highlights

*1 - Project TEMPLE LIFE: Scientific Mission in Antarctica aboard the icebreaker ship "Le Commandant Charcot"*

*2 - Study of microbial signatures in the water masses of the Ross Sea*

### Postcards from the ... workshop

### ISP Bibliography

*(July-December 2023)*

### Upcoming events

Thank you for these four years that have been full of novelty and excitement although not without some difficulties, as always happens in new adventures.

Dear Director, our best wishes for the future, trusting in your continuing support!



## UNDER THE SPOTLIGHT

### Farewell to Director Carlo Barbante

#### WG-Communication

We would like to say goodbye to our first Director, Carlo Barbante who, after four years, bids us farewell and returns to serve at Ca' Foscari University of Venice.

## REPORT

### CNR-ISP 2° Workshop of Institute

#### Thematic Area 1:

#### **“Contaminants and Ecosystems” - a look at the present and future perspectives**

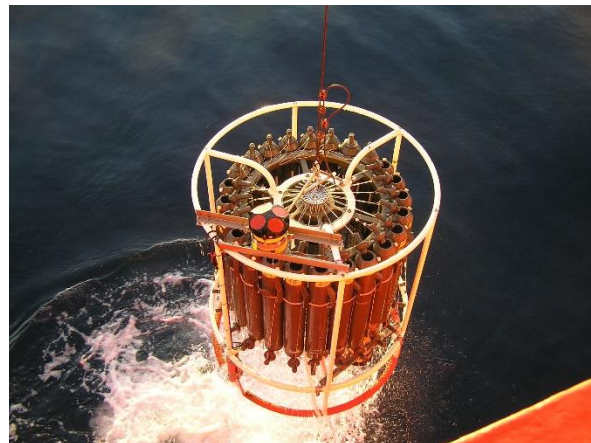
*Elena Barbaro, Maria Papale, Luisa Patrolecco, Francesca Spataro*

The thematic area (TA) "Contaminants and Ecosystems" aims to study the sources, transport dynamics, dispersion, and fate of regulated and emerging contaminants, including micro/nano plastics and trace elements, in polar ecosystems.



In this context, the multidisciplinary of the skills converging in this TA constitutes an indispensable requirement to understand the effects of anthropogenic impact and climate change on polar ecosystems, following a One Health approach and aiming for sustainable management of these vulnerable environments in the next future. It is divided into five closely related sub-themes: 1) sources, transport, and environmental dynamics, 2) from the development of analytical methods to the study of environmental processes, 3) plastic pollution - distribution and impact on the environment and biota, 4) underwater noise and impact on polar organisms, 5) ecosystemic responses and adaptations.

The TA sees the participation of researchers from all the Institute's locations, particularly Messina



(40%) and Venice (36%), being the most represented compared to Rome and Bologna (12% each). There are also active fruitful collaborations with external partners from doctoral students and personnel from Ca' Foscari University, to other entities such as ISPRA. The most represented skills are in the field of Analytical and Environmental Chemistry (35%), Microbiology (31%), followed by Acoustics (11%), Ecology (12%), and Chemistry applied to Ecology (11%).



The strengths of this TA are primarily the synergies, and complementarities between the activities carried out by its members, as well as the presence of important research infrastructures (i.e., polar bases) including analytical laboratories equipped with high-performance instrumentation. During the workshop the needs and gaps identified were the need to create greater interconnections between research groups, optimization of the available scientific resources and expertise within the institute, as well as the lack of personnel working on models applied to the interpretation of data collected during monitoring campaigns. These are important gaps that should be addressed in the future.

The evaluation of the impact and visibility of the "Contaminants and Ecosystems" shows high productivity of the involved researchers, with numerous publications in high-level scientific journals and strong international collaborations with major polar institutes outside Italy, as well as numerous Italian universities and research institutions.

## Thematic Area 2:

### Paleoclimate and Paleoenvironments

*AT2 - Paleoclimate and Paleoenvironments afferents*

The Anthropocene is a new geological time unit, albeit unofficially, describing the most recent period in Earth's history, characterized by significant human impacts on climate and global ecosystems. This era is marked by unprecedented technological advancements, enabling the measurement of crucial Essential Climate Variables (ECVs) with high temporal resolution tools like satellites and the prediction of future climate scenarios using climate models. However, instrumental measurements only date back to the mid-20th century, and climate simulations cover only a few centuries, making it uncertain if observed climate changes are part of natural

variability. Climate archives such as ice cores, marine/lacustrine sediments, corals, speleothems, and tree rings offer the opportunity to extend observations over time and provide valuable insight into future climate evolution.



Glacial Geomorphology (credits: R. Colucci, CNR-ISP)

The Paleoclimate and Paleoenvironments thematic area actively explores these natural climate history archives, using them as authentic 'time machines'. In particular, ISP researchers utilize them to trace past events, using biological, geochemical, and sedimentary indicators known as proxies, to better understand past climate and environmental conditions.



Cold-water coral specimens collected in the Southern Ocean (crediti: Julie Trotter UWA)

Integrating various archive types allows for a more comprehensive and interdisciplinary understanding of the climate system. During the Institute Workshop, the complementarity of different archives and ISP researchers' interest in ice cores, sediment cores, corals, speleothems, and glacial geomorphology became evident.

The period of interest spans from a few centuries during the "Common Era" to the Miocene, encompassing abrupt variations like the



Dansgaard–Oeschger events (decades/few hundred years). Additionally, among the 55 Essential Climate Variables (ECVs) defined by the Global Climate Observing System for climate study, ISP researchers monitor various ocean, atmosphere, and continental cryosphere ECVs, such as atmospheric and oceanic temperature, sea ice distribution, fire frequency, physical, chemical, and biological properties of the atmosphere and oceans, and terrestrial cryosphere dynamics like permafrost, glaciers, and snow cover. Finally, the workshop highlighted the high level of international collaboration with major foreign research centers in strategic paleoclimate areas.



Spelothem (credits: Rhawn Denniston Cornell College)

### Thematic Area 3: “Changes in Polar Systems” - a look at the present and future perspectives

*Nicoletta Ademollo, Maurizio Azzaro, Fabiana Corami, Federico Giglio e Stefania Gilardoni*

Polar areas are extremely sensitive hotspots for observing the alterations and transformations that are happening at different scales all over the planet. The astonishing rapidity with which these changes are taking place makes these issues



Credits: L Vimercati

increasingly present in the public domain, leaving the niche to which they have been confined for decades together with the geopolitical and



Credits: L Vimercati

economic as well as scientific implications they pose. Through multidisciplinary research, the thematic area “Changes in Polar Systems” seeks to improve knowledge of the processes and interactions among the different components of the Earth system (Atmosphere, Biosphere, Cryosphere, Hydrosphere and Lithosphere) and to assess their responses to global changes.



Credits: B. Rosso

The complexity of the area, reflected by the broad adhesion of ISP researchers featuring numerous cross-cutting expertise, is matched by an inherent multidisciplinary approach in the complexity of the different components of the Earth system and their relative interrelationships. Although at present we are still in the early days of a real successful implementation of the activities that ISP's different research groups carry out in this thematic area, a beneficial path has nevertheless been pursued to create more synergies among the different researchers belonging to it. Many

research infrastructures that are used by ISP researchers both in the polar field (Arctic, Antarctic and third pole) and on the national territory are of outstanding relevance, as are the collaborations and synergies at the national and international level. The extensive, cross-cutting and remarkable science outputs falling within the thematic area and the remarkable projects represented therein hold out hope for important future growth prospects.

## Thematic Area 4:

### “Earth Observation and Models” - a look at the present and future perspectives

*Francesco De Biasio, Francesco Filiciotto, Emiliana Valentini, Matteo Zucchetta*

The “Earth Observation (OT) and Polar Ecosystem Modeling” thematic area brings together around thirty researchers and contributes to the training of numerous doctoral and graduate students, and research fellows. The area embraces numerous disciplinary fields of natural sciences, ranging from ecology, physics, chemistry to earth sciences. The activity focuses on three methodological pillars and their integration: remote and in situ observations, information organization, and representation by numerical and conceptual models.

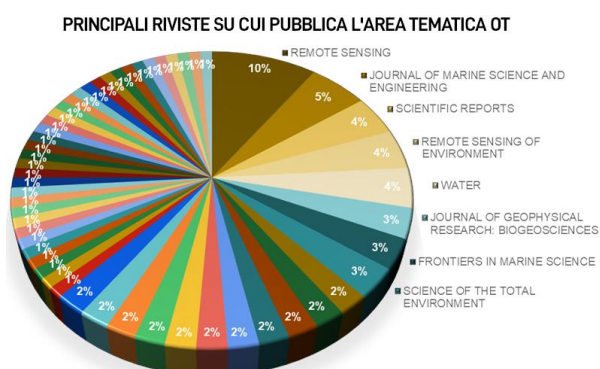


Fig. 1. Percentage distribution of the main journals in which research in thematic area 4 - Earth observation is published

Researchers in this thematic area mainly deal with the definition, description and study of the

processes that occur in the terrestrial, aquatic, and atmospheric spheres, publishing their research in a vast selection of international scientific journals, mainly dedicated to remote sensing (fig. 1).

The different groups make use of a variety of instruments either fixed or portable for the observation of the Earth, ranging from both active and passive sensors to electromagnetic detection. These are mounted on satellites, fixed to oceanographic buoys and moorings, which are also equipped with acoustic recorders or (fig. 2a), to the climate tower for atmospheric detection and (fig. 2b), to autonomous anemometric stations.

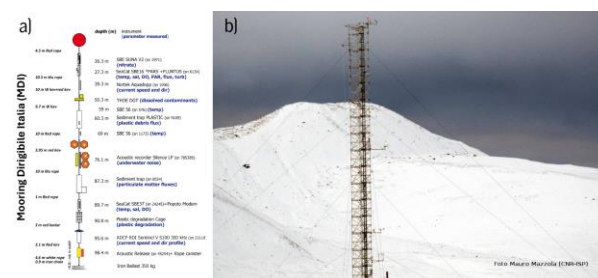


Fig. 2a. Representation of the permanent instrumented mooring DIRIGIBILE ITALIA (Kongsfjorden, Svalbard). The characteristics of surface, mid-depth, and deep waters, as well as anthropogenic acoustic pollution, are studied. Fig.2b. The Amundsen-Nobile Climate Change Tower (CCT) is an instrumented platform installed in Ny-Ålesund (Svalbard) and is 34 m tall, recording the thermodynamic characteristics of the lower atmosphere

The scientific investigation focuses on the dynamics of polar ecosystems, also paying attention to climate zones at different latitudes for comparison. Among the topics of greatest climatic impact, variations in air and sea temperature, sea level rise, changes in polar ice caps, characteristics of snow cover and ice (fig. 3), permafrost evolution and oceanic water masses, erosion and coastal growth processes, release and segregation of greenhouse gases, biogeochemical cycles, and biodiversity are analyzed.

In this thematic area, data-driven and process-based algorithms for geospatial and statistical analysis are developed and applied, with particular attention dedicated to organizing knowledge in terms of thesauri and metadata.



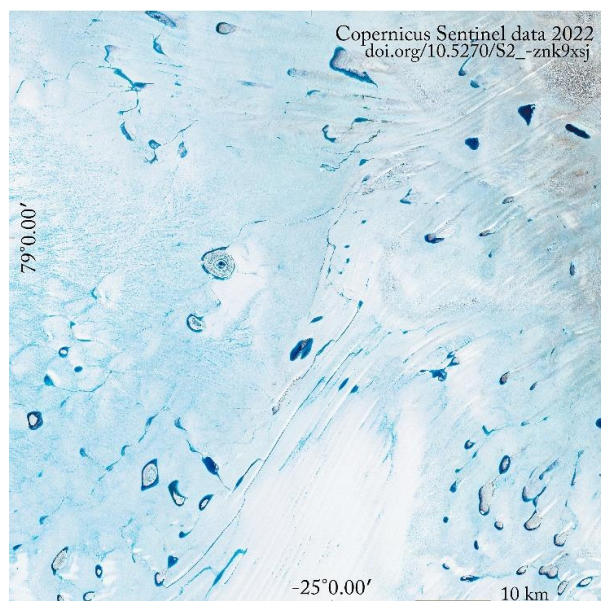


Fig. 3. Image captured by the Sentinel-2 satellite of ESA: some supraglacial lakes in Greenland are visible. The rapid evolution of these lakes contributes to accelerating glacier melting.

Continuous comparison allows for the integration of spatial and ecological models with observational data.

## Thematic Area 5:

### “Biosciences” - a look at the present and future perspectives

*Warren Cairns, Mario La Mesa, Angelina Lo Giudice*

Main themes of the Biosciences Thematic Area at CNR-ISP are:

- The structural and functional organization of polar ecosystems and dynamics of populations and communities.
- The response of individuals, populations, and communities to external influences of climatic and anthropic origin.
- Biotechnological implications resulting from adaptation to low temperatures and/or other physico-chemical factors.

These are then split into the following research objectives:

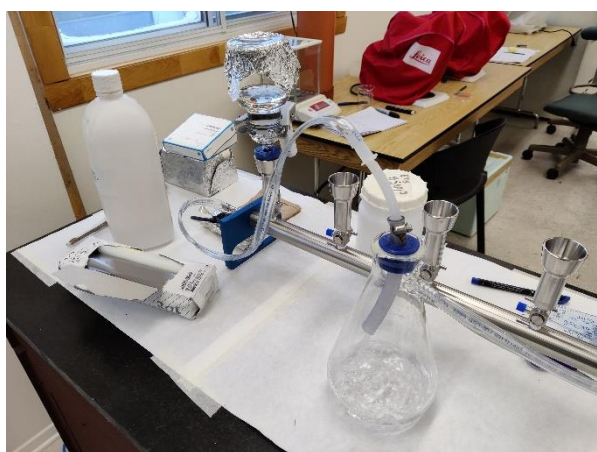


- The study of structural and functional diversity and the eco-physiology of polar organisms, shedding light on the limits of adaptation.
- The study of biogeochemistry and ecology in marine and terrestrial habitats in the Polar Regions, including environmental factors that control biological interactions.
- Estimation of the biotechnological potential of organisms adapted to life at low temperatures and/or other physico-chemical factors.
- Understanding the behavior and evolution of polar ecosystems through spatio-temporal analysis of ecological processes.
- Management and conservation of polar marine resources.
- Comparison of observed trends in polar areas and mid-latitudes.

The number of people working in this thematic area are 29 permanent staff, 10 temporary staff made up of PhD students, post-Docs and associated personnel from other research institutes and institutions. Over half work in Messina and the rest are distributed between Venice, Rome and Bologna.

Research activity in the 5 years since the Institute was founded has been supported by 32 projects from the PNRA, PNRR, and PRA national calls and

the INTERACT, ARICE and Horizon 2020 international calls. This has allowed us to build an excellent infrastructure to support our work with applied analytical chemistry being the strong points of the Rome and Venice labs, while the biological expertise is supported in Messina with labs specialised in ecology, biotechnology, microbial biogeochemistry and environmental microbiology.



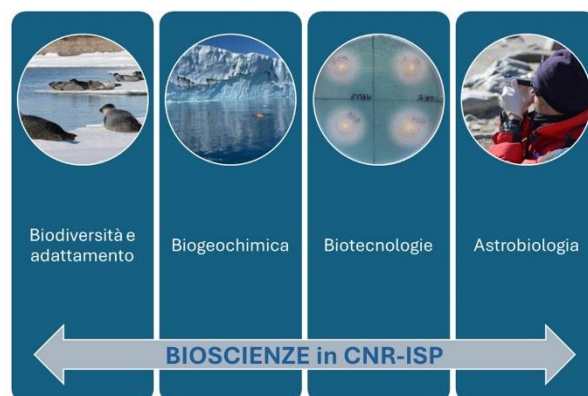
These resources are backed up by observatories for sample collection such as the LTER moorings in Antarctica, the PNRA cryo-ecosystem observatory, the SIOS coastal oceanographic buoy for biodiversity monitoring, the PRA arctic lakes



observatory and the MICR(Y)O - Culture Collection of Microorganisms from cryo-environments.

The strong points of our thematic area are the ability to attract funding, the interdisciplinary nature of our work and our presence in many international working groups such as SCAR and those of the Arctic Council. Our weak points are a lack of large instrumentation open to use by all, and a skills shortage in modelling, characterisation of biomolecules and in zoo and phytoplankton taxonomy.

During preparations for the workshop, we identified many points of potential future collaboration and expansion in fields such as epigenetics, the ecology and physiology of Archaea and micro-archaea in extreme environments, interactions of pollutants with biota and the assessment of the pollutant degradative capabilities of extremophile microbiota.



[Book of Abstract](#) and [Gallery](#) of the ISP workshop

## NEWS FROM DIRIGIBILE ITALIA



Kongsvegen, April 12, 2024. Credits: Federico Scoto (CNR-ISAC)

### *Mauro Mazzola*

The 2024 field season has officially begun at the Arctic Station Dirigibile Italia. As in recent years, the station will host researchers and technicians for a total of over 1500 person-days, with an average daily presence of around 6 people between February and September. The number of projects for 2024 remains around 30, and also this year the station will also welcome international colleagues through access programs.

Among the projects, two are of particular note, both funded by the PRIN program of the Italian Ministry of University and Research (MUR). The first is the PHOTOPANT project, led by the University of Rome 3, which aims to explore the combined influence of photoperiod and global warming on the flora and vegetation of Arctic and alpine environments. Through a series of targeted experiments, the project will assess the adaptability and plasticity of plants in response to these two key factors.

The second is SEDNA-Pp, led by the Institute for the Study of Human Impacts and Sustainability in the Marine Environment (IAS) of CNR. The project aims to understand how current changes in the oceans are affecting common minke whales in Kongsfjorden (migration and feeding) and to develop models to understand how the whales

might respond in the short term. This area represents an extreme case study, given its sensitivity to climate change.

Since the beginning of April, we have a new station leader, Veronica Coppolaro, who will coordinate the local activities of the base in the coming months together with Tessa. Veronica recently completed her PhD at the University of Manitoba, with a thesis on the effects of climate change and human impacts on Arctic marine mammals using bioacoustic techniques. We wish her all the best in her new role at Ny-Ålesund!



The new station leader Veronica Coppolaro



## RESEARCH HIGHLIGHTS

### Project TEMPLE LIFE: Scientific Mission in Antarctica aboard the icebreaker ship "Le Commandant Charcot"

*Francesco Filiciotto and Maurizio Azzaro*

The Institute of Polar Sciences has recently achieved a new milestone in its research mission, with the conclusion of an exciting expedition to Antarctica as part of the TEMPLE LIFE project (Template Habitat, Microbial Signatures and Iconic Life in the Antarctic Ocean), funded by the Antarctic Research Icebreaker Collaboration for Europe (ARICE) program.



On-board presentation of the project activity

The expedition aboard the icebreaker ship "Le Commandant Charcot" began on January 8 from Ushuaia in Argentina and concluded in Lyttelton, New Zealand, on February 5. During the mission, the two ISP researchers on board, Maurizio Azzaro (Principal Investigator) and Francesco Filiciotto, conducted various scientific activities, including the investigation of marine habitat through hydrological and oceanographic surveys and the visual sampling of marine mammal species. The main objective of the TEMPLE LIFE project was to explore the Southern Ocean using multidisciplinary approaches to gain a synoptic view of this unique and rapidly changing ecosystem.



The TEMPLE LIFE team (to left M. Azzaro, to right F. Filiciotto)

The project focused on understanding biogeochemical processes and microbial ecology with particular attention to carbon remineralization and the role of microorganisms.



© Christian Clauwers | [www.clauwers.com](http://www.clauwers.com)

Hydrological sampling

The latter play a key role in the marine carbon cycle, influencing primary production, carbon dioxide sequestration, and nutrient availability. The project also extended to monitoring Antarctic marine mammal populations to assess their conservation status, thus integrating the ecological project context.



Collection of water samples



Preliminary treatment of samples

The ISP researchers, with a strong multidisciplinary spirit, collaborated with other research groups on board from numerous International Scientific Institutions: including the Australian Centre for Whale Research, the Alfred Wegener Institute, University of Colorado, and Universidad Católica de Chile.



Collection of water samples



## 2 - Study of microbial signatures in the water masses of the Ross Sea

*Filippo Azzaro and Alessandro Ciro Rappazzo*

After two months of navigation in the Ross Sea aboard the icebreaker "Laura Bassi", on 5 March 2024, the 39th Italian Expedition to Antarctica ended for the CNR-ISP personnel.



During this expedition, activities were carried out as part of the PNRA-MUR project 'SIGNATURE' (PhySical and bioGeochemical traciNg of wATer masses at source areas and export gates in the Ross Sea and impact on the SoUtheRn OcEan), coordinated by Prof. Pierpaolo Falco of the Polytechnic University of the Marche.

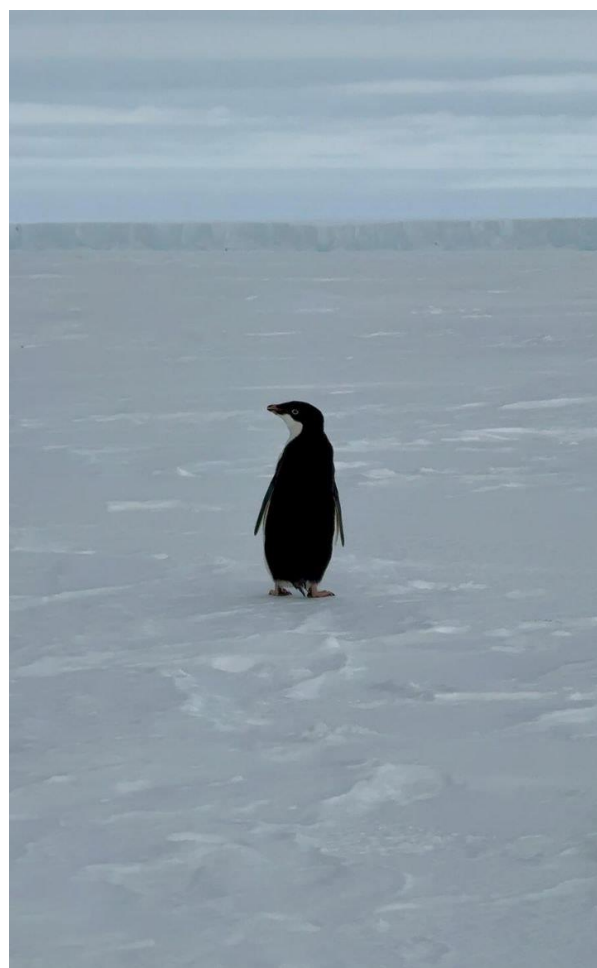


The research objective was to characterize the main water masses of the Ross Sea from a physical, chemical, and biological perspective. The Ross Sea is one of the main sites for the formation of Dense Shelf Water that contributes to the formation of Antarctic Bottom Water, present in the deepest zone of the Antarctic Ocean, which provides about 40% of the deep waters to the oceans and is considered one of the main cold drivers of the planet. In particular, the CNR-ISP operational unit was responsible for the collection and initial treatment of seawater samples for the

direct and indirect estimation of microbial abundance and biomass, their vitality, the estimation of respiratory and enzymatic activity,



and the determination of the isotopic ratio  $^{18}\text{O}/^{16}\text{O}$  and  $^2\text{H}/\text{H}$  (with the collaboration of IGG-CNR of Pisa) in the Ross Sea, including the Ross Ice Shelf, to obtain a detailed picture of the microbial signatures in the main water masses present there.





## POSTCARDS FROM THE ..... WORKSHOP

### 2nd Institute Workshop

Bologna, April 23-24, 2024: the 2nd Workshop of the Institute of Polar Sciences (CNR-ISP) entitled "Polar research: current issues and future prospects" was held at the CNR Research Area in Bologna. The workshop opened with greetings from our Director Carlo Barbante. The various representatives then gave an overview of the research activities taking place within the 5 Thematic Areas into which ISP is divided. Then the activities involving ISP researchers and administrative staff in many different areas were presented, from the PNRR Projects, the Working Groups supporting the Institute, access and management of the Base Dirigibile Italia, the establishment of the Polar Hub and, finally, to the administrative management. The poster session was an important moment of to meet and informally exchange ideas while presenting the results of various scientific activities carried out our ISP researchers.

*WG Workshop*



### 2nd Institute Workshop

Bologna, April 23-24, 2024

More than a year has passed but it is still not easy to say goodbye to our colleague and friend Angelo Viola. Too many things bind the institute and all of us to Angelo and that is why we wanted him to be with us in our thoughts at this second institute workshop ... so we could all say goodbye to him one last time.

*WG Communication*





## ISP Bibliography

(July-December 2023)

- Arcadi, E et al., Microbial communities inhabiting shallow hydrothermal vents as sentinels of acidification processes. *FRONTIERS IN MICROBIOLOGY*. [10.3389/fmicb.2023.1233893](https://doi.org/10.3389/fmicb.2023.1233893)
- Baker, DR et al., Sulfur and chlorine in nakhlite clinopyroxenes: Source region concentrations and magmatic evolution. *GEOCHIMICA ET COSMOCHIMICA ACTA*. [10.1016/j.gca.2023.08.007](https://doi.org/10.1016/j.gca.2023.08.007)
- Bargiela, R et al., Evolutionary patterns of archaea predominant in acidic environment. *ENVIRONMENTAL MICROBIOME*. [10.1186/s40793-023-00518-5](https://doi.org/10.1186/s40793-023-00518-5)
- Belloni, V et al., High-resolution high-accuracy orthophoto map and digital surface model of Forni Glacier tongue (Central Italian Alps) from UAV photogrammetry. *JOURNAL OF MAPS*. [10.1080/17445647.2023.2217508](https://doi.org/10.1080/17445647.2023.2217508)
- Bernardini, I et al., Contaminants from dredged sediments alter the transcriptome of Manila clam and induce shifts in microbiota composition. *BMC BIOLOGY*. [10.1186/s12915-023-01741-9](https://doi.org/10.1186/s12915-023-01741-9)
- Bonato, T et al., Fragrance materials affect life history parameters and gene expression in *Daphnia magna*: An emerging issue for freshwater ecosystems. *CHEMOSPHERE*. [10.1016/j.chemosphere.2023.138786](https://doi.org/10.1016/j.chemosphere.2023.138786)
- Cali, F et al., Life history traits and historical comparison of blue whiting (*Micromesistius poutassou*) growth performance from the western Pomo/Jabuka Pits area (central Adriatic Sea). *FRONTIERS IN MARINE SCIENCE*. [10.3389/fmars.2023.1291173](https://doi.org/10.3389/fmars.2023.1291173)
- Cali, F et al., Whiting (*Merlangius merlangus*) Grows Slower and Smaller in the Adriatic Sea: New Insights from a Comparison of Two Populations with a Time Interval of 30 Years. *FISHES*. [10.3390/fishes8070341](https://doi.org/10.3390/fishes8070341)
- Canesi, M et al., Differences in carbonate chemistry up-regulation of long-lived reef-building corals. *SCIENTIFIC REPORTS*. [10.1038/s41598-023-37598-9](https://doi.org/10.1038/s41598-023-37598-9)
- Canini, F et al., Wide divergence of fungal communities inhabiting rocks and soils in a hyper-arid Antarctic desert. *ENVIRONMENTAL MICROBIOLOGY*. [10.1111/1462-2920.16534](https://doi.org/10.1111/1462-2920.16534)
- Carturan, L et al., Modern air, englacial and permafrost temperatures at high altitude on Mt Ortles (3905 m a.s.l.), in the eastern European Alps. *EARTH SYSTEM SCIENCE DATA*. [10.5194/essd-15-4661-2023](https://doi.org/10.5194/essd-15-4661-2023)
- Caruso, G et al., Microbial Biofilm Colonizing Plastic Substrates in the Ross Sea (Antarctica): First Overview of Community-Level Physiological Profiles. *JOURNAL OF MARINE SCIENCE AND ENGINEERING*. [10.3390/jmse11071317](https://doi.org/10.3390/jmse11071317)
- Caruso, G et al., Small Microplastics: A yet Unknown Threat in the Svalbard (Norway) Region. *JOURNAL OF MARINE SCIENCE AND ENGINEERING*. [10.3390/jmse11122330](https://doi.org/10.3390/jmse11122330)
- Cesarini, G et al., Microplastics, Additives, and Plasticizers in Freshwater Bivalves: Preliminary Research of Biomonitoring. *WATER*. [10.3390/w15142647](https://doi.org/10.3390/w15142647)
- Clason, CC et al., Global variability and controls on the accumulation of fallout radionuclides in cryoconite. *SCIENCE OF THE TOTAL ENVIRONMENT*. [10.1016/j.scitotenv.2023.164902](https://doi.org/10.1016/j.scitotenv.2023.164902)





- Corrias, V et al., Marine soundscape and its temporal acoustic characterisation in the Gulf of Oristano, Sardinia (Western Mediterranean Sea). *MEDITERRANEAN MARINE SCIENCE*. [10.12681/mms.30322](https://doi.org/10.12681/mms.30322)
- Corti, A et al., Marine sponges as bioindicators of pollution by synthetic microfibers in Antarctica. *SCIENCE OF THE TOTAL ENVIRONMENT*. [10.1016/j.scitotenv.2023.166043](https://doi.org/10.1016/j.scitotenv.2023.166043)
- Costa, G et al., Sponges (Porifera) from the Ross Sea (Southern Ocean) with taxonomic and molecular re-description of two uncommon species. *POLAR BIOLOGY*. [10.1007/s00300-023-03205-w](https://doi.org/10.1007/s00300-023-03205-w)
- Crisafi, F et al., Antibacterial Properties of AquaSun Sol-Gel Coating. *ADVANCED ENGINEERING MATERIALS*. [10.1002/adem.202300626](https://doi.org/10.1002/adem.202300626)
- Del Gobbo et al., Atmosphere-cryosphere interactions during the last phase of the Last Glacial Maximum (21 ka) in the European Alps. *CLIMATE OF THE PAST*. [10.5194/cp-19-1805-2023](https://doi.org/10.5194/cp-19-1805-2023)
- Donato, A et al., Characterization of size-segregated particles' turbulent flux and deposition velocity by eddy correlation method at an Arctic site. *ATMOSPHERIC CHEMISTRY AND PHYSICS*. [10.5194/acp-23-7425-2023](https://doi.org/10.5194/acp-23-7425-2023)
- Enrichi, F et al., Effect of the crystal structure on the optical properties and Ag sensitization of Tb<sup>3+</sup>/Yb<sup>3+</sup> ions in silica-zirconia glasses and glass-ceramics. *CERAMICS INTERNATIONAL*. [10.1016/j.ceramint.2022.10.036](https://doi.org/10.1016/j.ceramint.2022.10.036)
- Feltracco, M et al., Occurrence and phase distribution of benzothiazoles in untreated highway stormwater runoff and road dust. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH*. [10.1007/s11356-023-30019-4](https://doi.org/10.1007/s11356-023-30019-4)
- Fugazza, D et al., Glaciological and meteorological investigations of an Alpine debris-covered glacier: the case study of Amola Glacier (Italy). *COLD REGIONS SCIENCE AND TECHNOLOGY*. [10.1016/j.coldregions.2023.104008](https://doi.org/10.1016/j.coldregions.2023.104008)
- Galli, G et al., Paleoenvironmental changes related to the variations of the sea-ice cover during the Late Holocene in an Antarctic fjord (Edisto Inlet, Ross Sea) inferred by foraminiferal association. *JOURNAL OF MICROPALAEONTOLOGY*. [10.5194/jm-42-95-2023](https://doi.org/10.5194/jm-42-95-2023)
- Gennaro, S et al., NDVI Analysis for Monitoring Land-Cover Evolution on Selected Deglaciated Areas in the Gran Paradiso Group (Italian Western Alps). *REMOTE SENSING*. [10.3390/rs15153847](https://doi.org/10.3390/rs15153847)
- Gilardoni, S et al., Drivers controlling black carbon temporal variability in the lower troposphere of the European Arctic. *ATMOSPHERIC CHEMISTRY AND PHYSICS*. [10.5194/acp-23-15589-2023](https://doi.org/10.5194/acp-23-15589-2023)
- Goodrich, CA et al., Enstatite meteorite clasts in Almahata Sitta and other polymict ureilites: Implications for the formation of asteroid 2008 TC3 and the history of enstatite meteorite parent asteroids. *METEORITICS & PLANETARY SCIENCE*. [10.1111/maps.14066](https://doi.org/10.1111/maps.14066)
- Hobson, MJ et al., TOI-199 b: A Well-characterized 100 day Transiting Warm Giant Planet with TTVs Seen from Antarctica. *ASTRONOMICAL JOURNAL*. [10.3847/1538-3881/acfc1d](https://doi.org/10.3847/1538-3881/acfc1d)
- Hönisch, B et al., Toward a Cenozoic history of atmospheric CO<sub>2</sub>. *SCIENCE*. [10.1126/science.adf5177](https://doi.org/10.1126/science.adf5177)
- La Cono, V et al., Nanohaloarchaea as beneficiaries of xylan degradation by haloarchaea. *MICROBIAL BIOTECHNOLOGY*. [10.1111/1751-7915.14272](https://doi.org/10.1111/1751-7915.14272)





- La Mesa, M and Eastman, JT, Assessing current knowledge and future challenges of age determination, life span and growth performance in notothenioid fishes: a review. *REVIEWS IN FISH BIOLOGY AND FISHERIES*. [10.1007/s11160-023-09829-9](https://doi.org/10.1007/s11160-023-09829-9)
- Landaeta, MF et al., Morphology and diet are decoupled in nearshore notothenoids from King George Island, West Antarctica. *JOURNAL OF FISH BIOLOGY*. [10.1111/jfb.15632](https://doi.org/10.1111/jfb.15632)
- Li, GY et al., Physicochemical characterization and source apportionment of Arctic ice-nucleating particles observed in Ny-Alesund in autumn 2019. *ATMOSPHERIC CHEMISTRY AND PHYSICS*. [10.5194/acp-23-10489-2023](https://doi.org/10.5194/acp-23-10489-2023)
- Loreto, MF et al., Slip-rates and time recurrences of the seismogenic Sant'Eufemia normal fault (SE Tyrrhenian Sea), a multiscale and multidisciplinary approach. *MARINE AND PETROLEUM GEOLOGY*. [10.1016/j.marpetgeo.2023.106453](https://doi.org/10.1016/j.marpetgeo.2023.106453)
- Mancuso, M et al., Monitoring of anthropogenic microplastic pollution in antarctic fish (emerald rockcod) from the Terranova Bay after a quarter of century. *SCIENCE OF THE TOTAL ENVIRONMENT*. [10.1016/j.scitotenv.2023.167244](https://doi.org/10.1016/j.scitotenv.2023.167244)
- Marchetta, A et al., A Deep Insight into the Diversity of Microfungal Communities in Arctic and Antarctic Lakes. *JOURNAL OF FUNGI*. [10.3390/jof9111095](https://doi.org/10.3390/jof9111095)
- Mazzi, G et al., Cortisol, cortisone and DHEAS in epidermis and scales of fish *Aphanius fasciatus*: HPLC-MS/MS measurement of stress indicators as proxies for natural and human-induced factors. *SCIENCE OF THE TOTAL ENVIRONMENT*. [10.1016/j.scitotenv.2023.166900](https://doi.org/10.1016/j.scitotenv.2023.166900)
- Narciso, A et al., Application of the *Aliivibrio fischeri* bacterium bioassay for assessing single and mixture effects of antibiotics and copper. *FEMS MICROBIOLOGY ECOLOGY*. [10.1093/femsec/fiad125](https://doi.org/10.1093/femsec/fiad125)
- Nogarotto, A et al., Coastal permafrost was massively eroded during the Bolling-Allerod warm period. *COMMUNICATIONS EARTH & ENVIRONMENT*. [10.1038/s43247-023-01013-y](https://doi.org/10.1038/s43247-023-01013-y)
- Núñez-Montero, K. et al., Editorial: Advances in biotechnological applications of extreme microorganisms. *FRONTIERS IN MICROBIOLOGY*. [10.3389/fmicb.2023.1276435](https://doi.org/10.3389/fmicb.2023.1276435)
- Oulmaati, L et al., Improving Solar Cell Performance with High-Efficiency Infrared Quantum Cutting in Tb<sup>3+</sup> Yb<sup>3+</sup> Codoped Silica Hafnia Glass and Glass-Ceramic Thin Films. *APPLIED SCIENCES-BASEL*. [10.3390/app13169390](https://doi.org/10.3390/app13169390)
- Perdichizzi, A et al., Live Yeast (*Saccharomyces cerevisiae* var. *boulardii*) Supplementation in a European Sea Bass (*Dicentrarchus labrax*) Diet: Effects on the Growth and Immune Response Parameters. *ANIMALS*. [10.3390/ani13213383](https://doi.org/10.3390/ani13213383)
- Pham, HV et al., Multi-model chain for climate change scenario analysis to support coastal erosion and water quality risk management for the Metropolitan city of Venice. *SCIENCE OF THE TOTAL ENVIRONMENT*. [10.1016/j.scitotenv.2023.166310](https://doi.org/10.1016/j.scitotenv.2023.166310)
- Polidoro, D et al., CO<sub>2</sub>-assisted hydrolytic hydrogenation of cellulose and cellulose-based waste into sorbitol over commercial Ru/C. *GREEN CHEMISTRY*. [10.1039/d3gc01813j](https://doi.org/10.1039/d3gc01813j) <http://dx.doi.org/10.1039/d3gc01813j>



- Rossini, M et al., Mapping Surface Features of an Alpine Glacier through Multispectral and Thermal Drone Surveys. REMOTE SENSING. [10.3390/rs15133429](https://doi.org/10.3390/rs15133429)
- Rosso, B et al., Quantification and Chemical Characterization of Plastic Additives and Small Microplastics (<100 µm) in Highway Road Dust. TOXICS. [10.3390/toxics11110936](https://doi.org/10.3390/toxics11110936)
- Salerno, F et al., Local cooling and drying induced by Himalayan glaciers under global warming. NATURE GEOSCIENCE. [10.1038/s41561-023-01331-y](https://doi.org/10.1038/s41561-023-01331-y)
- Sciaccia, V et al., Song Notes and Patterns of the Mediterranean Fin Whale (*Balaenoptera physalus*) in the Ionian Sea. JOURNAL OF MARINE SCIENCE AND ENGINEERING. [10.3390/jmse11112057](https://doi.org/10.3390/jmse11112057)
- Severi, M et al., The 239Pu nuclear fallout as recorded in an Antarctic ice core drilled at Dome C (East Antarctica). CHEMOSPHERE. [10.1016/j.chemosphere.2023.138674](https://doi.org/10.1016/j.chemosphere.2023.138674)
- Simoes, MF et al., The relevance of fungi in astrobiology research-Astromycology. MYCOSPHERE. [10.5943/mycosphere/14/1/13](https://doi.org/10.5943/mycosphere/14/1/13)
- Spagnesi, A et al., Preservation of chemical and isotopic signatures within the Weißseespitze millennial old ice cap (Eastern Alps), despite the ongoing ice loss. FRONTIERS IN EARTH SCIENCE. [10.3389/feart.2023.1322411](https://doi.org/10.3389/feart.2023.1322411)
- Spolaor, A et al., Editorial: Pan-Arctic snow research. FRONTIERS IN EARTH SCIENCE. [10.3389/feart.2023.1266810](https://doi.org/10.3389/feart.2023.1266810)
- Stefanini, C et al., Homogeneity Assessment and Correction Methodology for the 1980-2022 Daily Temperature Series in Padua, Italy. CLIMATE. [10.3390/cli11120244](https://doi.org/10.3390/cli11120244)
- Stoll, N et al., The new frontier of microstructural impurity research in polar ice. ANNALS OF GLACIOLOGY. [10.1017/aog.2023.61](https://doi.org/10.1017/aog.2023.61)
- Tichopád, D et al., Springtime evolution of stratospheric ozone and circulation patterns over Svalbard archipelago in 2019 and 2020. CZECH POLAR REPORTS. [10.5817/CPR2023-2-21](https://doi.org/10.5817/CPR2023-2-21)
- Turetta, C et al., Trace element, rare earth element and trace carbon compounds in Subglacial Lake Whillans, West Antarctica. SCIENCE OF THE TOTAL ENVIRONMENT. [10.1016/j.scitotenv.2023.164480](https://doi.org/10.1016/j.scitotenv.2023.164480)
- Valentini, E et al., Hyperspectral Mixture Models in the CHIME Mission Implementation for Topsoil Texture Retrieval. JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES. [10.1029/2022JG007272](https://doi.org/10.1029/2022JG007272)
- Zappalà, G and Caruso, G, Coastal Marine Monitoring Experiments at the National Research Council in Messina, Italy: 30 Years of Research. JOURNAL OF MARINE SCIENCE AND ENGINEERING. [10.3390/jmse11101958](https://doi.org/10.3390/jmse11101958)



## UPCOMING EVENTS

- [Working groups di SCOR](#): A call for Working Group proposals is now open. The proposals are due 17 May 2024 on particularly current and relevant topics with the aim of defining new research lines or innovative solutions.
- [XI Convegno Nazionale sul Particolato Atmosferico - PM2024](#) - Torino 28-31 maggio 2024. Il convegno metterà a confronto per alcuni giorni le più autorevoli comunità scientifiche sui temi legati al particolato atmosferico, che spaziano dalla composizione chimica alle dinamiche di trasformazione e di trasporto in atmosfera, dal monitoraggio ai modelli di diffusione e di caratterizzazione delle sorgenti, dalla tossicità agli effetti sulla salute e, in generale, dalle strategie di intervento alla gestione delle problematiche in materia.
- [Arctic Congress Bodø 2024](#). 29 May - 2 June 2024. The themes of Arctic Congress Bodø 2024 has followed those of Norway's Arctic Council chairship priorities in partnership with the Norwegian Ministry for Foreign Affairs. Norway's chairship of the Arctic Council focus on several core issues, including the impacts of climate change, sustainable development, and efforts to enhance the well-being of people living in the region.
- The Italian Aerosol Society in collaboration with Ca' Foscari University and the Institute of Polar Sciences-CNR is organizing the International IAS summer school "[Aerosol in polar and mountain areas: theoretical and practical aspects](#)". The events will be held in Venice-Mestre at the Ca' Foscari Science Campus from June 16-21, 2024.
- 'School and Workshop on Polar Climates: Theoretical, Observational and Modelling Advances' will take place on 22-31 July 2024 at @ictpnewsin Trieste, Italy. The call for applications is open until 1 April 2024. More information: <https://indico.ictp.it/event/10498/>
- The 2024 Annual Meeting of the European Meteorological Society will take place as a hybrid event at the Historical University of Barcelona & online from 2 to 6 September 2024. [UP2.6 - The cryosphere and cold region processes in the climate system](#). Conveners: Renato R. Colucci (CNR-ISP), Bianca Mezzina, Andrea Securo (CNR-ISP), Andrea Fischer.

SEGUICI SU:



Consiglio Nazionale delle Ricerche  
Istituto di Scienze Polari

<https://www.isp.cnr.it> - E-mail: [isp-gdl-comunicazione@isp.cnr.it](mailto:isp-gdl-comunicazione@isp.cnr.it)

Subscribe to our newsletter [here](#)  
Unsubscribe to our newsletter [here](#)

