

NATURE - Network for Advancing Technology in Using Research infrastructures for Environment

Proposta progettuale in risposta all'Avviso MUR DECRETO DIRETTORIALE N. 310 DEL 18-03-2025 PN RIC 2021-2027 - MANIFESTAZIONE DI INTERESSE PER IL POTENZIAMENTO DELLE INFRASTRUTTURE DI RICERCA (IR) PUBBLICHE CHE OPERANO IN AMBITO S3 FINALIZZATO ALL'AVANZAMENTO TECNOLOGICO DELLE IMPRESE.

CATALOGO OFFERTA Infrastrutture di Ricerca

	IR	Mission and Offert	website
		The Aerosol, Clouds and Trace Gases Research Infrastructure is the pan-European research infrastructure producing high-quality data and information on short-lived atmospheric constituents and on the processes leading to the variability of these constituents in natural and controlled atmospheres. Data services related to ACTRIS data, data products, and digital tools provided by ACTRIS Data Centre (DC) include: • Access to high-quality & long-term data, data for operational response, near real-time data and early warning services	
		 Access to long-term, quality controlled ACTRIS measurements data from both observational and exploratory platforms, data products, and digital tools, through a single entry point, comprising raw data, automatic calibrated and quality-assured data 	
		 Meta data associated to the data products documenting data, data traceability and data flow, citation service, and data attribution, including version control 	
		 Data curation service for campaigns and dedicated research projects and initiatives, external or internal to ACTRIS. 	
		Research Services:	
		 Physical access to instrumented observational and exploratory platforms for realisation of scientific experiments under ambient or controlled conditions 	
		 Use of state-of-the-art instrument and equipment supporting scientific excellence 	
		Technical Services:	
		 Provision of measurement quality assurance and quality control procedures and tools 	
		Instrument-specific calibration, testing, and intercomparison	
		Improvement of measurement and retrieval methodologies for aerosol, clouds, and reactive trace gases	
		Innovation Services:	
		• Design and co-design of instrumentation, equipment or procedures	
		• Exploration of instrument synergies and nover innovative research capabilities	nups.//www.acuris.eu/
		Inint instruments testing	https://www.actris.eu/cat
1	ACTRIS	Certification of prototypes	alogue-of-services

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		 Development of new observation techniques for aerosol, clouds, and reactive trace gases 	
		Improvement of measurement and retrieval methodologies for aerosol, clouds, and reactive trace gases	
		Training Services.	
		 DANUBIUS-RI is a distributed research infrastructure supporting interdisciplinary research on River-Sea Systems. DANUBIUS-RI provides science-based solutions to societal risks arising from global and climate change as well as coincident extreme events. Likewise, it will offer a source to sea perspective to resolve the problems of adverse human impacts on water and sediment quality and quantity, hydromorphology, and biodiversity and ecosystem functioning. Danubius offering: State-of-the-art and fit-for-purpose facilities of river to coastal sea observation systems; Development and implementation of interoperable and harmonised methods, tools and models, to achieve comparability across the freshwater-seawater continua; A data portal to integrate existing data and knowledge across sectors and disciplines, supplemented by new data and syntheses; Smart observation and analytical technologies developed jointly with small and medium-sized enterprises; Test beds for nature-based management and restoration solutions; Education and training programmes for scientists; Engagement with public authorities and policy makers through assessment, evaluation and measures to improve the environmental status of River-Sea Systems; 	
		• Outreach to, and education for, the interested wider public. The typologies of services offered by the Italian components will rely on Dataset (EO, satellite and in situ, model outputs	https://www.danubius-
2	Danubius	and products), Numerical models (Codes and manuals), equipment, and expert support.	ri.eu/index.html
		The Distributed System of Scientific Collections is a new world-class Research Infrastructure (RI) for Natural Science Collections. The DiSSCo RI aims to create a new business model for one European collection that digitally unifies all European natural science assets, sharing common access, curation, policies and practices across countries while ensuring that all the data complies with the FAIR principles (Findable, Accessible, Interoperable and Reusable data). DiSSCo aims to enable the community of NSCs to overcome its current limitations and thrive in this new, ever-evolving environment of opportunities. DiSSCo will transform today's landscape of individual European NSCs providing simple access to various data classes into a new reality: a comprehensive and sustainable knowledge base of unprecedented scale that links all data classes across institutions. From here, DiSSCo aspires to: • Create a one-stop e-science infrastructure providing discovery, access, interpretation, and analysis of complex	
		 linked data. Provide end-user services such as digitisation on demand, research support and training activities to address current community limitations. Ontimise collection access curation and management practices in individual institutions, enabling strategies under 	
		 a common research agenda. Accelerate digitisation, taking the current workflows to an industrial scale. 	
		• Permanently link representations of digital specimens to their attributes across distributed digital resources, thus ensuring robust science.	https://www.dissco.eu/
		• Reduce the global carbon footprint with digital collections access that will reduce international trips and global shipments of specimens.	DISSCO Community e-
3	DiSSCo	Improve efficiency, facilitate economies of scale, make natural science research more responsive and resilient to urgent needs and accelerate biodiversity discovery.	Services



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		EIRENE RI (Research Infrastructure for EnvlRonmental Exposure assessmeNt in Europe, www.eirene-ri.eu), is an ESFRI RI	
		that is part of the Italian national roadmap since 2021 (PNIR 2022). It is a pan-European distributed research	
		infrastructure (RI) aiming to enhancing multidisciplinary research on the human exposome by combining studies on	
		environmental pollution with studies on human exposure through an interdisciplinary approach by integrating expertise	
		in the environmental science with those in epidemiology and toxicology (i.e., human biomonitoring, human exposure and	
		risk assessment). Its aim is to address current scientific and social challenges in the environment-health and support	
		policy makers in shaping and implementing mitigation strategies for facing the impact of environmental pollution and	
		climate changes on human health. EIRENE is an open and inclusive RI, structured in 21 national nodes that involve over	
		50 partners (i.e., universities and research institutions) from European and non-European countries (USA). The main	
		objectives include physical, remote and virtual access to highly specialized research infrastructures (i.e., analysis	
		laboratories and virtual laboratories that will include environmental quality data obtained from in-situ and satellite	
		sensors, human exposure data, epidemiological data, risk assessment models), access to decision support systems and	
		services through a simple and easy-to-use open access system to data and tools (FAIR) designed to support policy makers	
		to implement strategies for preventing public health risks. EIRENE-ITALY is the Italian National Node which currently	
		includes the Institute on Atmospheric Pollution Research of the CNR (CNR-IIA), as coordinating institution, with a long	
		experience in environmental quality studies as well as in providing technical and scientific support to the policies for	
		implementing environmental legislation; the Italian Space Agency (ASI) which coordinates space programs and satellite	
		missions promoting the use of Earth Observation data for studies on air quality addressed to assessing human exposure	
		to the main air pollutants, and the Istituto Superiore di Sanità (ISS) which has a long experience in assessing	
		environmental risk factors due to human exposure to the main persistent pollutants in different environmental matrices.	
		The Italian national node supports the EIRENE RI, through the use of pre-existing infrastructures and services and the	
		launch of additional facilities and services to better support stakeholders, decision makers and researches. Currently	
		EIRENE RI offers physical, remote and virtual access to highly specialized research infrastructures as reported below.	
		EIRENE RI'S Services and infrastructures:	
		- human exposure data	
		- environmental quality data (both from in-situ and satellite sensors)	
		- epidemiological data	
		- risk assessment models	
		- Climate-Environmental infrastructure	
		- Environmental Laboratories	
		- Human and Biomonitoring laboratories	
		- National, Regional and Global Observation Network on persistent pollutants	
4	EIRENE	- EIRENE-ITALY Data Center (GOS4M Platform) already built and managed by CNR-IIA	https://eirene.eu/
Τ		The European Multidisciplinary Seafloor and water column Observatory (EMSO) aims ai exploring the deepness of the	
		oceans, to gain a better understanding of phenomena happening within and below them, and to explain the critical role	
		that these phenomena play in the broader Earth System.	
		EMSO consists of a system of Regional Facilities, both autonomous and cabled to shore, operating in key sites around	
		the European Plate, from Northeast Atlantic to the Black Sea, through the Mediterranean. The Regional Facilities include	
		platforms for monitoring the water column and the seafloor, and equipped with multiple sensors addressing a range of	
		disciples. The platforms constantly measure different biogeochemical, oceanographic, geophysical parameters, useful to	https://emso.eu/
		understand the generation of the natural hazards, and evolution of the climate changes and marine ecosystems.	
		EMSO offers data and services to a large and diverse group of users, from scientists and industries to institutions and	EMSO website –Services –
_		policy makers and it is an extraordinary infrastructure to provide relevant information for defining environmental	List of Services
5	EIVISU	policies based on scientific data.	

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		 EMSO is operated by a collaboration of research organizations sharing a common strategic framework in operating and developing the facilities (data, instruments, computing, and storage capacity) under the coordination by a European Research Infrastructure Consortium (ERIC), a special legal form created y the European Commission for pan-European large-scale research infrastructures the member of which are Member Countries (governments). EMSO achieved the Certification of Compliance to ISO 9001:2015 standard for the "Design, coordination, and development of environmental research activities on seafloor and water-column". EMSO Services include: Physical and Remote Access to the Infrastructure as a whole and to the Regional Facilities (marine and shore components) for experiments and tests; Training & Best Practices Services; Data Management Services and Data Access services; Communications & Branding Services; Lobby & Policy Services; International Relations & Partnering Services. 	
6	EUFAR	 EUFAR (The EUropean Facility for Airborne Research) is a unique pan-European portal and network dedicated to airborne research in the environmental and geo-sciences. It brings together infrastructure operators of both instrumented research aircraft and remote-sensing instruments with the scientific user community, both expert and early-stage researchers, other data users and stakeholders. Eufar's principal aim is supporting scientists, by granting them equal chance to carry out various atmospheric and in situ measurements onboard research aircraft by developing transnational access to national infrastructures. From planning summer schools, and expert workshops, and performing as an interactive and dynamic hub of information, to maintaining a central data archive, and developing tools and standards to collect, process and analysis data, EUFAR continues to improve the operational environment for conducting airborne research. EUFAR Objectives: Facilitate and promote transnational access to national research aircraft and instruments Reduce redundancy, fill the gaps, and optimise the use and development of airborne facilities to conduct research Improve the quality of the service by strengthening expertise through knowledge exchange, development of standards and protocols, the constitution of databases, and joint instrumental research activities Promote the use of research facilities, especially for young scientists from countries where such facilities are lacking, by providing education and training opportunities in airborne research 	https://www.eufar.net/ EUFAR website – Resources - Data - Data Catalogue EUFAR website - home - Transnational Access Activities - Access Offer
7	EURO ARGO	Euro-Argo ERIC is an European Research Infrastructure Consortium that manages and coordinates the European contribution to support 25% of the international global Argo mission. Argo is the world's largest in-situ ocean observation system based on a network of multi-parameter autonomous profiling buoys (Argo float). Euro-Argo ERIC aims to develop a long-term European contribution to the understanding of the oceans, their role in the climate system and their state of health. Argo floats perform measurements along the water column and can be equipped with a variety of sensors to measure temperature, salinity and biogeochemical parameters. The data are used for scientific research and by operational oceanography centres for studies ranging from climate change to monitoring the health of the oceans. Italy is a founding Member of the Euro-Argo ERIC and OGS is the Italian 'representing entity' (officially appointed by MUR). OGS also coordinates the Argo Regional Centre for the Mediterranean and Black Sea (MedArgo ARC). Argo must be considered in its ensemble: not only the instruments, but also the logistics necessary for their	https://euro-argo.eu/

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E (OBRETTIVITA		 programming and deployments, field operations, the associated data streams and data centers. That's why Euro-Argo establishes a high level of cooperation between partners in all the implementation aspects: operation at sea, array monitoring and evolution, technological and scientific developments, improvement of data access for research and operational oceanography (CMEMS), link to the international management programme, promotion of Argo Glider and Drifter, enlargement of data users community and help answering its needs. 	
		An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities. The Eurofleets will facilitate open access to an integrated and advanced research vessel fleet, designed to meet the evolving and challenging needs of the user community. The specific objectives are:	
		 Provide efficient, single-point, transnational access to an notable fleet of research vessels and specialised infrastructure for European and international research communities. Facilitate interdisciplinary research groups to access European and global seas and oceans to conduct excellent research, with priority given to new users, early stage researchers, women scientists and researchers from less equipped countries. 	
		 Develop tools and equipment to meet the evolving challenges of marine research, especially for deep ocean research and exploration, data management, and virtual access. Increase the likelihood of new innovative products, processes or services, important for the optimisation of the European research fleet and for future user needs, through close collaboration with industry. 	
		 Advancing the data management processes. Implementation of an active open data management strategy and associated procedures including adoption of SeaDataNet standards will ensure capture, transmission and publishing of information about the cruises, their data collection, and involved researchers, and data collected underway and processed later in time. Publication will take place through the EVIOR portal (European Virtual Infrastructure in Ocean Research – an integral part of the Eurofleets+ website) and the larger community SeaDataNet and EMODnet portals. The shipboard data management system, the (near) real-time transfer to shore, and the EVIOR portal for receiving and publishing metadata and data, will be advanced from their current state. The advanced version of the shipboard data 	
		management system will be successively piloted on board selected research vessels, and after evaluation, configured at a major number of Eurofleets+ research vessels. The functionalities of the EVIOR portal will be reviewed, improved and expanded, including providing researchers with unique cloud computing and analytical	https://www.eurofleets.e u/
		 Investigating and developing equipment and rigs for deep sea operations from vessels, Exploration of the deep sea is a major challenge and opportunity in marine research. Rigs and related technologies are fundamental to the study of the sea as they are needed to deploy equipment. Therefore Eurofleets+ will 	<u>Eurofleets website –</u> <u>Cruise Data - Cruise Data</u> <u>Sets Catalogue</u>
		 conduct investigations concerning deep sea research from vessels aiming at achieving interoperability of rigs to be able to deploy different equipment, enabling installation of mobile equipment when needed, and facilitating sharing and installation of equipment across different ships. Developing innovative methods and strategies for intelligent exploration, mapping and control using cooperative 	<u>Eurofleets website –</u> Access – Infrastructures – <u>By Type</u>
8	Eurofleets	 Innovative methods and strategies will be analysed and developed for intelligent exploration, mapping and control using cooperative navigation. Innovative methods and strategies will be analysed and developed for Autonomous Surface Vehicles (AUVs) and 	<u>Eurofleets website -</u> <u>Research</u>

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		Autonomous Underwater Vehicles (ASVs) and the innovations will be validated prior to field testing during operational cruises.	
		JERICO-RI is an integrated pan-European multidisciplinary and multi-platform research infrastructure dedicated to a holistic appraisal of coastal marine system changes. It is seamlessly bridging existing continental, atmospheric and open ocean RIs, thus filling a key gap in the ESFRI landscape. JERICO-RI establishes the framework upon which coastal marine systems are observed, analysed, understood and forecasted. JERICO-RI enables open-access to state-of-the-art and innovative facilities, resources, FAIR data and fit-for-purpose services, fostering international science collaboration. The JERICO-RI catalogue contains a structured overview of involved coastal platforms and developed services to access processed data. They are all searchable via a metadata search (free search or via facets). At the moment JERICO is providing the "JERICO-CORE service" as a single- point entry for getting access to JERICO coastal marine data. Furthermore the "Transnational Access service" is providing physical and remote access to about 60 JERICO facilities including some calibration laboratories. In addition, the JERICO Virtual Access provides access to about 20 European coastal ocean services. JERICO is shaping its governance to consider its future services (for example new Offices and/or Centers for calibration and validation of coastal ocean models and satellite products). The "access to data service" can be found at the following link https://www.jerico-ri.eu/jerico-ri-catalogue/#/map while the following link provides access to the JERICO-CORE services https://ui.core.jerico-ri.eu/ In addition, lists of the JERICO facilities for the Transnational Access and for the Virtual Access services are available at the following link provides access to the JERICO-CORE services and for the Virtual Access services are available at the following link provides access to the JERICO-CORE services and for the Virtual Access services are available at the	https://www.jerico-ri.eu/ JERICO website – Data –
	9 Jerico	following links, respectively: https://www.jerico-ri.eu/ta/jerico-facilities-in-ta and <u>https://www.jerico-ri.eu/virtual-access</u> .	<u>Jerico RI Catalogue</u>
	10 1005	 ICOS RI is a distributed research infrastructure operating standardised, high-precision, and long-term observations and facilitating research to understand the carbon cycle and to provide necessary information on greenhouse gases. ICOS-based knowledge supports policy- and decision-making to combat climate change and its impacts. ICOS is the European pillar of a global GHG observation system. It promotes technological developments and demonstrations, related to GHGs, by the linking of research, education and innovation. The key points of ICOS RI's vision define the strategic focus areas (SFAs): Sustainability, Scientific excellence, Societal impact, Global cooperation and Innovation. The main service provided by ICOS is access to station data, provided by the Carbon Portal. The datasets are available in different quality-level formats, from raw, near real-time data for ground-based stations, to reviewed and accuracy certified data and products. Generally, the full series of data are available for each labeled station. The access to any of this data is free and open to any user, and available for any use, as defined by the license adopted (Creative Commons Attribution 4.0 International license (CC BY 4.0) in the Data Policy. In addition, data products are created for different audiences, widening the target users from non-experts to advanced users. This is the case of the implementation of data access and analysis in a Virtual Research Environment based on Jupyter Hub, making use of Restful API services, which facilitated computational intensive analysis, and interoperability with other systems. ICOS bata generation and processing belong to them. ICOS doesn't provide or promote physical access to measurement stations as a service due to the concern of creating local disturbance; however, the RI makes stations available for co-location with other RIs or for instrumentation to 	
		support related research.	https://www.icos-cp.eu/
	TTLITEW		https://www.lifewatch.eu/



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ECOMPETITIVITA		 the calculation of demographic and morphological traits and to execute phytoplankton traits analyses. To run the web services included in the VRE users can upload their own data files, structured according to the Phytoplankton Data Template, or can select demo data files provided by LifeWatch Italy. The aim is to produce harmonized data and perform comparative analyses. The available workflows are: Atlas of Phytoplankton; Atlas of Shape; Phytoplankton Traits Thesarurs; Traits Computation; Size Class Distribution; Size Density Relationships. The LifeWatch Italy Training Catalogue hosts the metadata of relevant learning resources so that these can be shared, searched, discovered, accessed and reused. The LifeWatch Italy training catalogue's accurate and descriptive metadata allow all users to find the most appropriate and well-suited educational resources for their needs. Metadata are based on a subset of the IEEE Standard for Learning Object Metadata (IEEE 2002) that has been customised in order to be compliant with the EOSC Training Resource Profile - Data Model. The detail page of each single metadata record includes all the descriptive information and, on the right side of the page, a button "Start the course" that allows to access the resource and hence to start the training. The LifeWatch Italy Citizen Science platform is a place for sharing knowledge, tools, training material and other resources for participatory projects in biodiversity and ecosystem research. It is a platform that facilitates citizens science, on its potential and applications; best practices and tutorials on the development and management of citizen science projects; a catalogue of citizen science projects with an open-source webGIS for viewing initatives on a map-based interface; a tool for creating mini-sites for citizen science orgoicts; a customisable web application supporting citizen science activities related to the collection of geo-referenced observations; integration between various components and se	
12	SIOS	 The Svalbard Integrated Arctic Earth Observing System (SIOS) is an international observing system for long-term measurements in and around the Norwegian archipelago of Svalbard addressing Earth System Science questions. Services are provided by SIOS Knowledge Centre or by member institutions: <u>Access and logistical services</u> - The SIOS access services provide coordinated access to the various scientific facilities and equipment owned by SIOS members. Logistical services are coordinated sharing of logistical support and possibilities as well as requests for support. <u>Remote sensing services</u> - Remote sensing services are designed to offer researchers a single-point of contact for ground-, airborne-, and satellite-borne information for Svalbard while drawing on the combined knowledge of the network of SIOS partner institutions. The service coordinates commissioned remote sensing data processing to make geoinformation products available via the SIOS data access portal. <u>Data management services</u> - The SIOS Data Management System (SDMS) is providing a unified interface to data that are produced using SIOS related infrastructure and third-party datasets that are of relevance to the SIOS scientific 	https://sios-svalbard.org/ https://www.isp.cnr.it/ind ex.php/en/infrastructures /research- stations/dirigibile-italia https://nyalesundresearc h.no/research-and- monitoring/infrastructure <u>/</u>

COESIONE ITALIA 21-27 RICERA, INNOVEZIONE	
 community. This is a distributed data management system where SIOS partners operating their own data cer connected to SDMS using specific technological and documentation standards. Dirigibile Italia is one of the multidisciplinary research stations managed by the CNR, providing support to nu national and international research projects. The station, inaugurated in 1997, is located in the village of Ny-Alesund N, 11°56' E), on Spitsbergen Island, in the Svalbard archipelago. CNR- DSSTTA managed the station in the past, bu now been assigned to the Institute of Polar Sciences (since July 2020). Connected to the station are the following scientific platforms: Climate Change Tower: a 33 m high meteorological tower equipped with meteorological/radiation/ instrumentation for the study of the processes in the lower boundary layer; Gruvebadet Atmospheric Laboratory: in-situ aerosol chemical and physical observations; Italian Marine Observatory System (moorings and coatal buoy): sea water physical observations (e.g. temper salinity, current), dissolved gases, carbonate system, eDNA and others available parameters. Data is uploaded and made freely available at the Italian Arctic Data Center (IADC, https://iadc.cnr.it). Data services related to SIOS/ data, data products, and digital tools provided by IADC include: Access to logi-quality, long-term and near real-time data; Access to logi-quality, and ligital tools, through a single entry point, comprising raw data, automatic callibrated quality-assured data; Meta data associated to the data products documenting data, data traceability and data flow, citation se and data attribution, including version control; Data curation service for campaigns and dedicated research projects and initiatives. Research Services: Hybrid (physical/remote) access to instrumented observational and exploratory platforms for realisation scientific excellence;<td>ntre are merous I(78°55' It is has I'surface erature, erature, and rvice, I of users;</td>	ntre are merous I(78°55' It is has I'surface erature, erature, and rvice, I of users;