



FIRI 2023 Call - applications funded in December 2023 decision meeting

Listed in alphabetical order by research infrastructure name.

BBMRI.fi - Biobanking and Biomolecular Resources Research Infrastructure of Finland (BBMRI.fi)

Finnish Biobanks, Finnish Institute for Health and Welfare, Finnish Red Cross, Helsinki University Central Hospital, The Wellbeing Services County of Central Finland, The Wellbeing Services County of Pirkanmaa, The Wellbeing Services County of Southwest Finland, University of Eastern Finland, University of Oulu

BBMRI.fi (www.bbmri.fi) is a research infrastructure comprising all ten public and academic biobanks in Finland (later referred to as Finnish Biobanks). BBMRI.fi is the Finnish National Node of the European level BBMRI-ERIC infrastructure (www.bbmri-eric.eu). Finnish Biobanks Cooperative - FINBB is coordinating, developing and serving the operative actions of all Finnish Biobanks. The vision of BBMRI-ERIC is to build and strengthen the value-added sustainable biobanking enabling clinical translational research in academia and industry and facilitating developing new treatments and creating new innovations in personalized medicine. Finnish Biobanks and the coordinator FINBB are actively participating in implementation of the BBMRI-ERIC Work Programme with specific emphasis in providing Common Services for IT, Quality and Ethical and Legal Issues. The mission is to build a state-of-the-art biobank network in the world. Fingenious is the gateway to Finnish biobanks and biomedical research.

Biocenter Finland: Critical Investments in National Life Science Research Infrastructures (Biocenter Finland)

University of Helsinki, University of Eastern Finland, University of Oulu, Tampere University, University of Turku, Åbo Akademi University

Biocenter Finland (BF) is a nationwide Life Science research infrastructure organization owned by six Finnish universities. BF coordinates 15 technology platforms comprising of 70 core facility units covering key technologies in Life Sciences, and provides open access services to 17,000 academic, healthcare, and industry researchers across Finland. BF is widely considered an exemplar in coordination and strategic use of



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financial and human resources within a discipline. BF is applying for critical equipment and digital updates in six platforms to continue providing high-quality services for cutting-edge research in Life Sciences. These platforms cover areas in genomics, proteomics & metabolomics, bioimaging, digital pathology and gene transfer & cell therapy. These instruments are critical investments for the current research infrastructures to support the nation-wide network of services and provide access to cutting-edge technologies for innovative research.

European Organisation for Nuclear Research (CERN)

University of Helsinki

The Large Hadron Collider (LHC) at CERN, the European Laboratory for Particle Physics, is the world's largest particle accelerator enabling searches for new physics in particle collisions at record energies. To find even rarer signals, the accelerator will be upgraded to a high-luminosity LHC (HL-LHC). Finland participates in two large LHC experiments, CMS and ALICE. The current CMS charged particle tracking system will not survive the harsh HL-LHC radiation environment. Therefore, a completely new tracker with improved performance is required to be able to look for physics beyond the known Standard Model of particle physics at the HL-LHC. ALICE will build a new Forward Calorimeter (FoCal) to seek evidence for gluon saturation, a fundamental property of strong interactions. The project provides Finland's contribution to the new CMS tracker. An automatic bonding machine will be acquired for the Helsinki Detector Laboratory to produce parts for the CMS tracker and the ALICE FoCal.

Euro-BioImaging Finland: Finnish Advanced Microscopy Node (Euro-BioImaging Finland: FiAM)

Åbo Akademi University, University of Helsinki, University of Oulu, University of Turku

Bioimaging with advanced microscopes is one of the most used research methods in life sciences, needed by almost all researchers studying for instance cancer medicine, viruses or the immune system. In Finland, critical services in bioimaging are provided by the Finnish Advanced Microscopy Node (FiAM), operating in Turku, Helsinki and Oulu. FiAM is led by Turku BioImaging, and it is the most popular service unit of the large European landmark infrastructure Euro-BioImaging. FiAM's services are very important also for numerous Finnish health and drug development companies. In the 3D-BioImage project, FiAM will establish an extensive set of the newest microscopy methods, capable of high-resolution 3D imaging also from living samples. FiAM will also establish 3D image analysis services based on artificial intelligence, and a remote access



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model for the green transition. All the new services are critically needed by FiAM's users and significantly broaden the Node's societal impact.

FIN-CLARIAH - Developing a Common RI for CLARIAH Finland (CLARIAH)

Aalto University, CSC - IT Centre for Science Ltd., Tampere University, University of Eastern Finland, University of Helsinki, University of Jyväskylä, University of Oulu, University of Turku

FIN-CLARIAH is a research infrastructure for Social Sciences and Humanities (SSH) comprising two components, FIN-CLARIN and DARIAH-FI. In the current project, FIN-CLARIAH seeks to significantly upgrade the SSH infrastructural support in four directions: 1) to enable the processing of spoken minority language data, 2) to provide tools for a broad range of SSH research processing unstructured text, 3) to facilitate research in audio-visual culture by processing metadata, 4) to support transformer technology uptake among SSH researchers. While FIN-CLARIN continues to break new ground in supporting research based on language data, DARIAH-FI will develop infrastructure for big, heterogeneous datasets for research in the humanities and social sciences. An important additional aim of the current project is to develop a best common practice for the management of access to copyrighted data for research verification according to the text and data mining directive.

Finnish Marine Research Infrastructure (FinMaRI)

Geological Survey of Finland, Finnish Environment Institute, Finnish Meteorological Institute, Natural Resources Institute Finland, University of Helsinki, University of Turku, Åbo Akademi University

The Finnish Marine Research Infrastructure (FINMARI) combines all major partners (Syke, FMI, GTK, Luke, Universities of Helsinki, Turku and Åbo Akademi) of the Finnish marine research community. It is a distributed infrastructure network of field stations, research vessels, laboratory facilities, ferryboxes, autonomous measurement platforms and buoys. FINMARI provides access to observational and experimental marine research facilities. Our joint infrastructure development plan is based on addressing the multiscale variability of the marine environment by integrating the complementary areas of expertise of each partner. FIRI2023 project aims at filling the remaining gaps in the present research infrastructure as well as maturing digitalization and Open Access to data and services. FINMARI will concentrate on global Triple Crisis: biodiversity loss, climate change and pollution and will act as a link between science and policy makers.



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Finnish Quantum-Computing Infrastructure (FiQCI)

CSC - IT Centre for Science Ltd., VTT Technical Research Centre of Finland Ltd.

Quantum computers can dramatically increase the impact of research, by enabling solutions to problems that will forever stay intractable using conventional computing alone. Quantum computing is expected to impact practically all areas of research. Some of the most pressing challenges of our society, from accurate modelling of complex weather systems, via optimisation of resource usage, to development of novel, sustainable materials can be tackled with unprecedented vigour using quantum-accelerated supercomputing. To harness the full potential of this quantum revolution, tailor-made algorithms and software that take advantage of quantum physical phenomena like superposition and entanglement have to be developed. The Finnish Quantum-Computing Infrastructure (FiQCI) provides an open-access, state-of-the art, hybrid high-performance computing and quantum computing (HPC+QC) platform. FiQCI is accessible through a unified interface, serving the entire national research and development scene.

Integrated Atmospheric and Earth System Research Infrastructure: Integrated observations for effective climate solutions in terrestrial ecosystems (INAR RI)

CSC - IT Centre for Science Ltd., Finnish Environment Institute, Finnish Meteorological Institute, Natural Resources Institute Finland, Tampere University, University of Eastern Finland, University of Helsinki, University of Oulu, University of Turku

INAR RI is an umbrella RI, coordinating the distributed national nodes of European environmental research infrastructures (ICOS, ACTRIS, eLTER and AnaEE). INAR RI is benchmarking in the integration of multidisciplinary comprehensive environmental measurements with 30 stations, several laboratories and mobile units and two data infrastructures. This project shall upgrade the existing RI with a focus on the urban and agricultural environments and develop services to help the society to answer questions related to air quality and climate change. This project strongly supports the national goal of carbon neutrality by providing missing information regarding urban and agricultural emissions allowing us to assess the full air quality and climate impacts and feedbacks related to agricultural activities and urban greenery.



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Magnetic resonance research environment for advancing green transition (MR4GT)

University of Oulu

Magnetic resonance research environment for advancing green transition (MR4GT) is an open access infrastructure supporting research and education in almost all Finnish and tens of international universities and research institutes. It is also the lifeline of many companies. The MR4GT infrastructure is a part of Centre for Materials Analysis at the University of Oulu. Currently, the instrumentation of the MR4GT infrastructure includes five high field NMR spectrometers as well as two portable low-field NMR spectrometers. The MR4GT infrastructure serves research and innovations aiming to develop novel MR techniques with unprecedented sensitivity, efficiency, and information content for molecular and materials research, and apply them for advancing green transition and lifelong health. In this call, we apply funding for a 500 MHz NMR spectrometer equipped with a broadband helium-cooled cryoprobe, which significantly improves the sensitivity and versatility of NMR analysis in the MR4GT.

RawMatTERS Finland Infrastructure (RAMI)

Aalto University, Geological Survey of Finland, VTT Technical Research Centre of Finland Ltd.

The RAMI Circular Raw Materials Research Infrastructure (RI) is hosted by Aalto, GTK and VTT. It is designed to strengthen the long-term core world leading Finland-based expertise in natural and new inorganic material research that is needed to meet the global Green Transition challenges required to combat climate change. The RI is especially important for activities related to closing the raw material loops and sustainable energy research, to increase the value of primary mining products, secondary raw materials, their processing, and sustainable use in high-performance applications. It is fundamental for education of the future experts in the field. Close collaboration with industrial stakeholders ensures the rapid transfer of research to market applications. By year 2030 our target is for RAMI to be the openly accessible, Finnish, European and global RI Hub for the circular economy and sustainability of energy materials through the infra-networks of the EIT Raw Materials and beyond.



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STRUCTURAL BIOLOGY FINLAND (FINStruct and Instruct-ERIC)

University of Helsinki, University of Eastern Finland

Structural biology is central to all biomolecular sciences such as biochemistry, biomedicine, pharmacology, biology and biophysics. With it we can tackle critical societal challenges within medicine, pharmaceuticals and sustainability, including e.g. developing new drug molecules or engineering novel enzymes for green chemistry. We will invest in two critical areas, cryogenic electron microscopy and native mass spectrometry, that will improve sample purity and characterization in structural biology pipelines in the national (FINStruct) and international services for Finnish structural biology (Instruct-ERIC FI). The results will go into heavily used, free, open databases e.g. the worldwide Protein Data Base where structures were downloaded nearly three billion times in 2022. Apart from the impact in the societal challenges mentioned already, we will also contribute to education and outreach activities, promoting understanding of how research helps e.g. in development of drugs.