

Areas and research infrastructures

The areas and research infrastructures eligible for funding in the call Grants to research infrastructures of national interest 2025 are described in this document. The texts clarify instructions and limitations for each application, in addition to what is described in the general call text.

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ACTRIS Sweden

The Aerosols, Clouds and Trace Gases Research Infrastructure (ACTRIS) coordinates operations in several European countries where aerosols, clouds and trace gases are observed and studied. ACTRIS Sweden is the Swedish node, which includes several measuring stations.

Description of the area

The Earth's climate and human health are affected by aerosols, clouds and trace gases in the atmosphere. To understand the links between human impact and natural processes in the atmosphere and biosphere, long-term, quality-controlled, and standardised measurements are needed. The purpose of ACTRIS is therefore to produce high-quality, comparable data about physical, chemical and optical characteristics of short-lived, climate-impacting air pollution, and to make these data accessible openly and efficiently.

ACTRIS data are used by researchers in many research fields, and contribute to improved parameters for climate and air quality models.

Needs and possible delimitations

To describe how aerosols, clouds, and trace gases in the Earth's atmosphere affect climate and air quality, and in the longer term the health and preconditions for life of humans and other organisms, standardised and high-quality data are needed. The issues addressed – such as air pollution and climate change – are global, and observations therefore have to be made across borders and in different climate zones. The Swedish network of measuring stations can contribute data from our immediate surroundings and should cover a large range of ecosystem, climate and air pollution gradients.

ACTRIS Sweden has received funding as a research infrastructure of national interest since 2022 and is expected to be in full operation as from 2027.

Scientifically, ACTRIS complements related research infrastructures, such as ICOS and SITES. Continued co-location and coordination with these is expected to lead to increased scientific and strategic value for the infrastructures, and more efficient administration. An application should include these aspects and otherwise focus on continued development of the current operation (Reg. No 2021-00177).

ArchLab

ArchLab is a distributed research infrastructure that coordinates a number of laboratories where methods from natural sciences are used to tackle archaeological questions.

Description of the area

Research in archaeology contributes knowledge about people and societies, about spatial organisation and material culture, and about the relationship between climate, environment, diseases, and social systems. The material that forms the basis for answering research questions often consists of physical findings and samples from investigations, which make them suited to natural sciences analysis methods, such as geophysical prospecting, materials analysis, microscopy, DNA analysis, and age determination. The purpose of ArchLab is to coordinate the laboratories included into a platform that makes work easier and more efficient for the users.

Needs and possible delimitations

The use and development of scientific lab-based methods are central in archaeology and related research fields. The methods applied to archaeological material can vary from image analysis to destructive interventions in samples, and the scales can vary from small molecules to large geographical areas. This requires a broad set of competences, to maximise the value and minimise the interventions performed on the samples. By gathering together expertise and methods, and linking these to fully developed user support, more knowledge can be obtained from the available material. Existing methods thereby also become more accessible for individual researchers. Standardisation and data management, as well as technology and methodology development, are expected to be promoted by coordinating different laboratories and methods. In addition, increased use of complementary methods may provide opportunities for new scientific discoveries.

ArchLab has received funding as a research infrastructure of national interest since 2024 (Reg. No 2023-00174) and is expected to move towards full operation of a well-developed infrastructure concept during the ongoing grant period. An application should focus on continued development of the current operation.

ARTEMI

ARTEMI is a distributed research infrastructure for advanced electron microscopy, with primary focus on materials science.

Description of the area

Materials science studies structures and dynamic processes at different scales, and the mechanical, electric, thermal, and chemical characteristics these entail. The area is central for several technical application areas that require materials with new and improved characteristics to address many of the global challenges we are facing, for example in electrification, renewable energy production, and management of massive amounts of data. Researchers in materials science use advanced instruments to study materials and material characteristics at the relevant scales.

Needs and possible delimitations

As one of several tools used in materials science, a need for advanced electron microscopy has arisen, to better understand how materials are built up and function. At ARTEMI, researchers, public agencies and companies have the opportunity to conduct their studies with support from experts on the individual instruments. At ARTEMI, MAX IV, and, in the future, ESS, different characteristics of material can be studied. The methods used at the three infrastructures complement each other.

ARTEMI has received funding as a research infrastructure of national interest since 2022 (Reg. No 2021-00171). An application should focus on continued development of the current operation, and in particular describe how national coordination of user support and instrument access can be strengthened. An application should not include costs for new instrumentation/equipment.

Chemical Biology Consortium Sweden

The distributed research infrastructure Chemical Biology Consortium Sweden (CBCS) helps researchers to identify and use small molecules as tools for identifying, studying, and modulating biological processes. The purpose is to understand and influence cellular processes at molecular level.

Description of the area

Chemical biology is a multidisciplinary field, where the interaction between small molecules and biomolecules is used as a tool for studying biological processes in detail. The techniques are used in a number of research disciplines, but the greatest need for chemical biology exists within biomedical research, where the field is closely linked to both pharmaceutical development and to diagnostics and monitoring in health care and medical care.

Upon applying to CBCS, researchers can get help to design cellular or molecular systems to investigate a specific biological process. There is also access within the infrastructure to various small molecule libraries, and opportunities to conduct large-scale screening to identify active small molecules and investigate their biological functions.

Needs and possible delimitations

For research in chemical biology, there is a need for both specific expertise and also instrumentation and small molecule libraries. Collecting and making these accessible in an infrastructure entails increased opportunities to utilise, quality-assure, and refine initial research results linked to biomedicine and pharmaceutical development.

CBCS, with its current funding from the Swedish Research Council since 2022, is created to address these needs. There is also a need for development of services, for example in advanced cellular models, structure-guided AI-driven screening pipelines, and data-driven strategies for finding new ligands and for investigating effect mechanisms. CBCS-KI is the Swedish node in EU-OPENSOURCE ERIC.

An application should focus on continued development of the current operation (Reg. No 2021-00179).

Digitisation of Swedish print

The proposed infrastructure is based on a number of previous digitisation projects and initiatives, and aims to bring together existing material, as well as large-scale digitisation of the printed collections of libraries with large collections, to create a joint entry portal for access to digitised Swedish print.

Description of the area

Traditionally, research based on print collections have focused on close reading and translation of material, but humanities and social sciences research has in recent years experienced a rapid development with increasing use of digital methods to analyse digitised material. There is currently an under-used potential in the use of digitised print, and with the help of an infrastructure for digitising, aggregating, and making Swedish print accessible, research would be able to address scientific challenges in new ways, and achieve breakthroughs in research that would be impossible without digitisation. The infrastructure is expected to provide increased access to the shared literary cultural heritage for both academia and the general public, as well as serve as an enhanced resource for the development of high-quality language models.

Needs and possible delimitations

Swedish print today represents an underutilised potential for Swedish research. Digitising the materials of the resource-heavy libraries is of great importance if Sweden is to maintain its position relative to comparable countries in research on printed materials. The need to make existing text archives accessible from a research perspective through the digitisation and aggregation of already digitised material is significant. Currently, only a small part of the library collections is digitised and accessible via infrastructure that is suitable for the purpose. Making digitised print accessible via a common portal can enable entirely new and better analyses and method developments.

An application should focus on methods for digitisation, methods for analysing digitised material (including advanced user support), and making it accessible for the researchers that can benefit from the material.

The ELT instrument METIS – Swedish participation

METIS (Mid-infrared ELT Imager and Spectrograph) is being developed as one of the first instruments at the astronomy organisation ESO's giant telescope Extremely Large Telescope (ELT) in Chile.

Description of the area

METIS is expected to provide increased understanding of the solar system, the prevalence and characteristics of Earth-like planets, the formation and development of astronomical objects, such as protoplanetary system discs, stars, star clusters, and galaxies. ESO's ELT, which is expected to be completed no later than 2030, will be an optical mid-infrared telescope with a diameter of 39 metres. International consortiums are building instruments for the telescope, among them METIS – a camera and spectrograph for mid-IR, which will be one of the first on the telescope. Organisations from some ten countries are taking part in the development and construction of METIS. Those who contribute to the development receive guaranteed observation time (GTO) in return.

Needs and possible delimitations

Swedish researchers are currently participating within the framework for SELTIC (Swedish ELT Instrumentation Consortium) in the development of two second-generation instruments, ANDES and MOSAIC, which are in part funded by the Swedish Research Council. Swedish interest in using METIS, which is among the first generation of instruments, is assessed to be as great as for both of these, and matches the scientific interests of several Swedish university departments. Competence in a specific type of software development is currently lacking in the international METIS consortium. This competence can be found among Swedish researchers, who have therefore been asked to take part in the consortium and contribute to the development of the instrument.

An application should highlight how more Swedish researchers than those who contribute to the development of instruments for ELT can be included in the GTO programme, and how the expertise in ELT instrumentation that will gradually accumulate within the SELTIC consortium can also be used by a broader Swedish user base.

EPOS-ERIC - Swedish participation

The European Plate Observing System (EPOS) has since 2018 operated as an ERIC, hosted by Italy. EPOS links together, harmonises, and makes data accessible from different data sources around Europe that describe the state of the solid earth. The EPOS data portal was launched in 2023.

Description of the area

Research into the solid earth answers questions on the origin of Earth and its internal processes, and how these interact with the surrounding spheres (atmosphere, hydrosphere, and biosphere). Some areas where this research has been of great importance to humans are the extraction of natural resources, understanding of earth tremors and volcanic eruptions, the Earth's long-term flows and the carbon cycle. Access to harmonised and easily accessible data that cover large geographic areas improves the opportunities for high-quality and effective research. The EPOS data portal aims to offer this for European data sources, and is accessible to all.

Needs and possible delimitations

The launch of the data portal in 2023 was a milestone for EPOS' work. EPOS will continue to make further data sets and data types accessible, which entails continued implementation of data standards and procedures. EPOS is also planning increased functionality for visualisation and analyses in the data portal.

Sweden became a member of EPOS-ERIC in 2023, and is currently participating with data deliveries within five of EPOS' thematic areas (Reg. No 2021-00170). Swedish participating is expected to continue in these thematic areas.

EUROfusion – Swedish participation

The Swedish infrastructure node for participating in EUROfusion brings together Swedish researchers in this European consortium for fusion research. The operation is linked to the fusion research reactor ITER, which is being built in Cadarache in southern France, and the subsequent demonstration facility DEMO.

Description of the area

Fusion research aims to provide society a fossil-free, sustainable basic power source for electricity, with an abundance of fuel, minimal safety and security risks, and without long-lasting waste products.

Today's fusion research focuses on preparing for the future ITER facility and the proposed demonstration facility DEMO. The infrastructure contributes to development in areas such as plasma diagnostics, analysis of the components that can withstand the plasma, plasma control, and integrated modelling. In Europe, the research is carried out through a number of experiments, both national and international, and through theoretical research and modelling. The infrastructure model gathers together and coordinates the related Swedish fusion research initiatives.

Needs and possible delimitations

The world's need for sustainable electric power sources has perhaps never been clearer. Fusion power is a potential way forward. As fusion research facilities are large-scale, considerable undertakings over a long period are needed, in collaboration with many countries. In Europe, fusion research is coordinated within the EUROfusion consortium, under the European EURATOM treaty, with key activities linked to the reactors ITER and DEMO.

Swedish fusion researchers form a research unit within the consortium. Through this membership, they get access to Europe's most important facilities, which allocate research and development tasks to its members on a competitive basis.

An application should focus on continued development of the current fusion related operations (Reg. No 2021-00182 and 2023-00157).

European Solar Telescope

European researchers in solar physics are planning the next generation solar telescope, the European Solar Telescope (EST). The telescope will be built on the island of La Palma in the Canaries, and is expected to become operational in 2030. Swedish researchers who operate the Swedish solar telescope, SST, are taking part in the planning.

Description of the area

Research in solar physics focuses on understanding the structure and dynamics of the solar atmosphere. Increasing the understanding of these processes, as well as the impact the Sun has on Earth, is important for research fields such as astrophysics, geophysics, climate research, and space physics. Research in solar physics requires access to either ground-based telescopes or space probes and satellites.

Needs and possible delimitations

EST is planning to study the following overarching questions: What can the Sun teach us about fundamental astrophysical processes? What drives solar variability on different scales? What impact does solar activity have on life on Earth? The aim is to build a solar telescope with a primary mirror with 4.2 metre diameter, which entails an increase of a factor of 4 in spatial resolution and an increase of a factor of 15 in light collecting ability, compared to today's largest European solar telescope.

As SST to some extent functions as a testbed for EST instrumentation, it is important that the Swedish expertise can be transferred to the next generation solar telescope.

Swedish researchers have received funding from the Swedish Research Council for a number of years to participate in the planning of EST (Reg. No 2023-00169). A new application should correlate different levels of Swedish contribution with the estimated effects of the participation in terms of observation time, scientific return, and possible industry collaboration, for example. Furthermore, the status for establishing an ERIC, as well as other potential member countries contribution plans, should be included, or alternatively at what point they are in their respective decision-making processes.

InfraVis

InfraVis is a distributed research infrastructure that provides expertise and methods for visualising scientific data in all scientific fields.

Description of the area

Visualisation of scientific data has become ever more important, in line with increasing computing capacity, new visualisation methods and analytical tools, and due to increased demand within many research fields that handle large data amounts. Via InfraVis, researchers get access to visualisation expertise from several organisations under the same umbrella. The infrastructure offers software solutions, user training, and development of online tools. InfraVis also contributes to increasing awareness of the opportunities of visualisation, and offers highly developed tools and expertise in research communication, for the purpose of increasing the level of knowledge also outside academia.

Needs and possible delimitations

Today's research is largely data-driven, and data analysis has become an ever more important part of research in nearly all research disciplines. Often, the generated data set is very extensive and complex, which means that intricate relationships and connections may be missed if only standard computational methods are used. Adequate visualisation of empirical data can in some cases be crucial for showing synergies, singularities, or processes. But expertise in visualisation of large data sets is today not always available in the research teams that carry out the actual data collection and analysis, and therefore continued development of a national infrastructure of this type is justified.

An application should focus on continued development of the current operation (Reg. No 2021-00181), including clarifying the specific scientific contribution of InfraVis, irrespective of subject area.

Instrumentation for the icebreaker Oden

Oden is one of the world's most powerful ice-breakers, and currently one of the primary research platforms in the polar oceans. The vessel is owned by the Swedish Maritime Administration, and the Swedish Polar Research Secretariat plans and coordinates the research expeditions.

Description of the area

The hard-to-access polar regions are key areas for understanding the climate and changes to it. Thanks to its great ice-breaking capacity, the Oden ice-breaker is one of very few vessels in the world that can provide opportunities for multidisciplinary in-situ measurements in and around the Arctic and the Antarctic. Oden is therefore an important platform for researchers in a large number of scientific fields, such as climate, environment, meteorology, geology, marine sciences, and glaciology. Oden can also be used as a mobile laboratory for field measurements in hard-to-access land areas, and is therefore also a resource for researchers who are not traditionally dependent on vessels.

Needs and possible delimitations

To ensure that Oden can continue as a world-leading research platform during its remaining economic life, upgrades and maintenance of its equipment for marine and atmospheric research onboard are necessary. The upgrades should allow research that looks for answers to questions relating to the polar areas' sensitivity to warming, focusing on interactions between atmosphere-ice-sea, and marine geology. Moreover, the upgrades should provide opportunities for new scientific discoveries, potentially in more disciplines, and enable access to the ship for new researchers.

In an application, the relationship with SWERVE (coordination for marine research vessels) should be clarified. Furthermore, Oden's lifespan as a research vessel should be considered, and how equipment from Oden can be transferred to other marine research vessels, for example a new research ice-breaker, should be described. An application should not include funding for the operation of the Oden ice-breaker.

ISOLDE

The ISOLDE facility (Isotope Mass Separator On-Line facility) at CERN in Switzerland supplies radioactive ion beams that are used for research, primarily in nuclear physics, but also in atom physics and more applied research.

Description of the area

ISOLDE produces radioactive ion beams for research in nuclear physics, nuclear astrophysics, atom physics, materials science, biophysics, and medical physics. For example, ISOLDE investigates the strong force in atomic nuclei, and how stable substances are created inside exploding stars. It also investigates exotic forms of atomic nuclei that violate the charge conjugation parity symmetry (known as ‘CP violation’) in a way that cannot be explained by the standard model of particle physics.

ISOLDE is an experimental infrastructure where the users benefit from the interplay of scientific and technical transfer between ISOLDE and the rest of CERN, for example in accelerator development, detector development, and data management.

Needs and possible delimitations

Within the ISOLDE collaboration, Sweden gets access to radioactive ion beams that enables basic research, and possibly increasingly also applied research, in several fields.

An application should focus on continued development of the current operation (Reg. No 2021-00174).

National Archive Database

The establishment of a national e-infrastructure for archival data would enhance research opportunities by making digitised archival holdings structured and accessible.

Description of the area

Because of its long archiving tradition, Sweden has a very large amount of authentic information that stretches from the Middle Ages up to today. The National Archive Database (NAD) at the National Archives plays the most important national role in searches for archive contents, and already has a large user base consisting of researchers, public agencies, and the general public. With the help of information from NAD, research questions relating to societal development, civil society, and bureaucracy can be asked and answered, as can questions relating to the lives and living conditions of individual persons. Today, however, the opportunities to conduct research on the material are limited, as it is both costly and time-consuming to search through and read the content. New digital methods developed in recent years, not least artificial intelligence (AI), give rise to entirely new opportunities.

Needs and possible delimitations

Humanities and social sciences research is increasingly in need of access to digitised cultural heritage collections for analysis and processing. With the help of new technology, AI models can be developed and the material structured to better utilise the long, unbroken time series of information held in the NAD. In this way, questions can be directed at all digitised material in the archival database, which would allow entirely new research questions to be posed and existing questions to be answered much more quickly than today. Furthermore, research into language models, as well as development of models for accessing digitised information, will be facilitated.

An application should focus on methods for digitisation, methods for analysing digitised material (including advanced user support), and making it accessible for researchers.

NordSIMS-Vegacenter

NordSIMS-Vegacenter at the Swedish Museum of Natural History is an existing infrastructure for micro-imaging and geochemical micro-analysis based on advanced mass spectrometry.

Description of the area

With the help of NordSIMS-Vegacenter's high-resolution mass spectrometers, researchers can study the isotope composition of different materials, and in this way learn more about their origin, development and age. The infrastructure is primarily used for questions in geoscience, environmental science, and planetary science, but also in fields such as biology, life sciences, and archaeology. Both basic research and applied research are enabled, and analyses and development of methods that support societal development, for example in the transition to more green technology and mining.

Needs and possible delimitations

Nationally accessible resources for micro-imaging and geochemical micro-analysis with advanced instruments, complementary facilities and user support of the type made available at NordSIMS-Vegacenter enables research in a large range of research fields, from basic research to applied projects. Combined facilities and competences and well-developed processes and procedures give users with differing backgrounds and knowledge access to high-quality equipment on equal terms. Generally, needs are expected to continue towards ever greater precision and higher resolution, and an even broader user base.

An application should focus on continued development of the current operation (Reg. No 2021-00276).

Onsala Space Observatory

Onsala Space Observatory, which is part of Chalmers University of Technology, is the Swedish national infrastructure for radio astronomy. In addition to operating and developing telescopes and advanced instruments, Onsala functions as the Swedish party to major international radio astronomy projects.

Description of the area

Researchers who use Onsala's resources are found in a broad spectrum of astronomy, and study planets, stars, galaxies, and black holes, among other features.

Telescopes that are used independently or together with others are developed and operated at the facility, using Very Long Baseline Interferometry (VLBI) technology. In addition to operating and developing its own telescopes, Onsala functions as a node for Swedish users who wish to interact with or gain access to international radio astronomy facilities, such as ALMA (Atacama Large Millimeter/submillimeter Array), JIVE (Joint Institute for VLBI), LOFAR (Low Frequency Array), and SKA (Square Kilometre Array). Onsala provides user support, works with technology development, and provides support for computations.

Needs and possible delimitations

Onsala, together with researchers at Chalmers University of Technology and Swedish companies, is involved in advanced technology development of digital receivers for the upgrade of ALMA and the construction of SKA. Another major goal is the development of the Swedish node of SKA's regional centre, which will store and process large data flows – which requires innovations in AI and machine learning to enable these data to be used to the full.

An application should focus on continued development of the current operation within the so-called 'radio astronomy package' (Reg. No 2019-00208), that is, operation and development of Onsala Space Observatory and its activities, including SKA. The application must not include membership fees for JIV-ERIC and LOFAR-ERIC.

Protein Production Sweden

Protein Production Sweden, PPS, is a distributed research infrastructure consisting of a number of protein production facilities with associated expertise and services. PPS was established in 2022.

Description of the area

Proteins are necessary for all processes in living cells, and access to recombinant proteins with an active structure is crucial for many areas of biomedical research. Research fields in biology, chemistry and environmental studies, as well as more applied research in areas such as pharmaceutical development, biotechnology, and foods also have great need of high-quality proteins.

The research infrastructure PPS coordinates expertise and offer help with protein production in a number of different expression systems, labelling methods, protein purification techniques, plus additional services and advice in recombinant protein production. Following an application, users are directed to the node where the expertise is best suited to solving the problem.

Needs and possible delimitations

The need for an infrastructure for protein production that gives users access to protein production facilities, methods, as well as services and competences on equal terms is great, as the proportion of users who lack their own expertise in the area is expected to increase. Gathering together nodes with complementary specialities in different protein production methods, means that both expertise and a broad range of techniques become nationally accessible. Collected knowledge of the outcome of production methods also has the potential to be used as a basis for AI development in the area.

An application should focus on continued development of the current operation (Reg. No 2021-00166).

SuperADAM

The neutron reflectometer SuperADAM is an instrument for advanced materials analysis at the international research infrastructure for neutron scattering, Institut Laue-Langevin (ILL) in France, where Sweden is a member. SuperADAM is operated by Uppsala University.

Description of the area

SuperADAM is a world-leading spin-polarised neutron reflectometer that can be used in both high- and low-resolution configurations, depending on the material to be analysed. With SuperADAM, it is possible to measure the scattering of neutrons from different interfaces, with high precision. The instrument has two settings: one that is used mainly for research into soft materials, and one that is suitable for measurements of both hard materials and magnetism. The instrument is used in a number of research fields to investigate surfaces and also interfaces deep inside a material, at a level that lies between a few to hundreds of nanometres.

Needs and possible delimitations

Super ADAM is an instrument optimised to measure scattering from surfaces, similar to some instruments at the soon to be commissioned research infrastructure European Spallation Source (ESS). There is a need to prepare the research community ahead of the commissioning of ESS, both for the research opportunities it entails, and for the possibilities for instrument construction at ESS. New concepts can be tested at SuperADAM, thanks to its flexible construction and high-level performance. Furthermore, SuperADAM can contribute to accumulation of competence in the field through the build-up of instrumentation and sample environments for different research communities, widening international collaboration with other researchers, and by continuing to produce new research results.

An application should focus on continued development of the current operation (Reg. No 2021-00159).

Swedish population databases for research

An infrastructure for making population data at individual level accessible to Swedish and international research through coordination of the most important historical population databases in Sweden.

Description of the area

Sweden is a world-leader in register-based research and demographics, largely thanks to Sweden's long tradition of population registers and parish registers. To facilitate access to longitudinal and comprehensive population data, the research infrastructure SwedPop was established. The infrastructure consists of a number of historical population databases that together provide information at individual level for large parts of Sweden's population in the 19th and 20th centuries, and its data are used to illuminate broad-based questions relating to population, living conditions, and health in a longitudinal and comparative perspective. Besides SwedPop, a new initiative in the population data area is being proposed, "Automated Transcription and Linking of Historical School Data" (ATLASS), aimed at constructing historical school data for cohorts born 1905–1941, at individual level, based on digitisation of church records and *Dagbok med examenskatalog* ("Diary with examination catalogue").

Needs and possible delimitations

The existing research infrastructure SwedPop is of great importance for historical demographic research, but also for research in economics, sociology, and medicine. There is now a need to broaden the selection of data to include the greater part of Sweden's population, to extend the cause of death register further, and to add any missing population and housing censuses. This, together with digitisation and the access to historical education data proposed within ATLASS, would enable new research into areas such as inter-generational processes and the effects of societal transformations on living conditions and inequality.

An application should focus on continued development of SwedPop's current operation (Reg. No 2021-00183), and a possible coordination of SwedPop and ATLASS as a joint research infrastructure of national interest.

Swedish Solar Telescope

The Swedish solar telescope, SST, is located on La Palma in the Canary Islands and is operated by the Institute for Solar Physics, hosted by Stockholm University. Europe is making plans for EST, the European Solar Telescope, as the next generation solar telescope.

Description of the area

Research in solar physics focuses on understanding the structure and dynamics of the solar atmosphere. Increasing the understanding of these processes, as well as the impact the Sun has on Earth, is important for research fields such as astrophysics, geophysics, climate research, and space physics. Research in solar physics requires access to either ground-based telescopes or space probes and satellites. The Swedish 1-metre solar telescope (SST) has been operational since 2002.

Needs and possible delimitations

SST and its instrumentation are among the world-leading solar telescopes in terms of image quality and instrumentation. SST is optimised for the major questions in solar physics of the future, such as understanding the heating and dynamics of the hottest layers of the solar atmosphere: the chromosphere and the corona. The most powerful instruments for scientific studies at SST are CRISP2 and CHROMIS-POL, which study the upper chromosphere, and HeSP, which studies magnetic fields in this layer. SST can also contribute to observations of space weather and solar storms.

As SST also functions as a testbed for instrumentation for the planned major European Solar Telescope (EST), parallel planning is in progress so that the Swedish expertise can be transferred to the next generation solar telescope. The opportunities to widen the use, for example by making a larger part of the observation time accessible in open competition following application, and by developing the provision of data, should be considered.

An application should focus on continued development of the current operation (Reg. No 2021-00169). An overarching description of the step-wise development from SST to EST should be included, provided that EST is realised.

SwedNMR

Nuclear magnetic resonance (NMR) is a technology with wide areas of use, in fields such as life sciences, chemistry and physics. The research infrastructure SwedNMR gathers together NMR instrumentation and expertise into a national infrastructure that coordinates user support and instrument access at national level.

Description of the area

By using the magnetic characteristics of atomic nuclei, different NMR techniques provide information at the atomic level about chemical, structural, and dynamic characteristics in systems in chemistry, biology, medicine, and materials science. Following an application to SwedNMR, researchers can get access to specialised NMR instrumentation at one of the participating nodes, and to expert support for help with experiment design, implementation, and subsequent data handling.

The emphasis is on bio-NMR, focusing on studies of the structure, interaction and dynamics of biomolecules, materials NMR based on solid state NMR, and on translational NMR focusing on metabolomics, in-cell NMR, and studies of small molecules.

Needs and possible delimitations

NMR spectroscopic techniques can contribute new approaches and opportunities to acquire knowledge in several research fields, but requires expertise and expensive equipment. Gathering this together into a national infrastructure gives advanced users access to state-of-the-art instrumentation, and gives researchers from other research disciplines the opportunity to get expert help. SwedNMR, with its current funding from the Swedish Research Council since 2022, has access nodes with a larger instrument park, which are complemented by expert nodes that provide specific competences.

An application should focus on continued development of the current operation (Reg. No 2021-00167), with coordination of user support and instrument access between the different nodes.

SWERVE

The infrastructure SWERVE (Swedish Research Vessel Infrastructure for Marine Research), which was established in 2024, coordinates access to research time and technical competence at a number of major Swedish research vessels, and safeguards delivery of quality-controlled standardised data from these.

Description of the area

Research vessels are used for observations, process studies and experiments, in fields such as oceanography, marine biology, marine geology, atmospheric research, and natural resources management. Research questions that can be answered with the help of a research vessel infrastructure cover a broad spectrum, and include areas such as mechanisms for and changes over time of climate changes, ocean currents, biodiversity, and environmental pollution.

Vessel-based data collection may be done through instrumentation onboard, instrumentation located in the water, or by launching autonomous vessels. Access to technical competence is crucial for the research carried out onboard, and the ability to manage and quality-assure data from the different instrument types is necessary to ensure the data produced can be delivered to openly accessible international databases.

Needs and possible delimitations

In Sweden, the research vessels are owned and operated by individual higher education institutions and other public agencies. By coordinating the vessels and creating transparent processes, Swedish researchers can get equal opportunities for vessel time and technical expertise on the research vessels included, irrespective of the researcher's organisational location. Furthermore, it is possible to ensure that the vessel most suited to the specific project is used. The coordination of Swedish research vessels also enables harmonisation of the vessels' equipment, competence building for technical personnel, and coordination and delivery of quality-controlled and standardised data from the locations the vessels visit, and the experiments carried out.

SWERVE has received funding as a research infrastructure of national interest since 2024 (Reg. No 2023-00159) and is expected to develop towards full operation of a well-developed infrastructure concept during the ongoing grant period.