



**SODANKYLÄ GEOPHYSICAL OBSERVATORY
IN THE HEART OF THE CHANGING ARCTIC
EST. 1913**



TASKS OF THE OBSERVATORY

SGO has a national and an international task to continuously provide long-term observations of the space and geoenvironment around the clock non-stop, and to detect and warn about the hazards that arise from these environments.

The Observatory performs long-term measurements, builds new instruments and sensors, innovates and maintains the domestic and international measurement infrastructures, and performs research from these measurements – both from SGO's own measurement sites and from partners as well.

The Sodankylä Geophysical Observatory has operated in the Sodankylä Space Campus in Tähtelä ("The Place of Stars" in Finnish) since 1913. The Observatory which was originally founded by the Finnish Academy of Science and Letters takes care of national and international duties as an independent research organisation part of the University of Oulu. The research work that is based on the continuous work performed throughout decades has grown and advanced significantly through the years. Currently the Observatory provides the world's leading Arctic monitoring capability, which is based on its own observations and instruments.

The national task of SGO include the monitoring of the magnetic environment, auroral measurements, determination of the atmospheric structure and its properties, seismic monitoring, monitoring cosmic and solar disturbances, and changes in the radio environment.



PRESENTATION VIDEO



**THE SODANKYLÄ GEOPHYSICAL OBSERVATORY
IS AN INDEPENDENT RESEARCH ORGANISATION
PART OF UNIVERSITY OF OULU WHICH IS
LOCATED IN THE AURORAL OVAL 120 KM FROM
THE ARCTIC CIRCLE.**

COLLABORATORS





MEASUREMENTS, INFRAS

SGO'S SITUATIONAL AWARENESS CENTRE PRODUCES AND PROVIDES REAL-TIME INFORMATION ABOUT THE ATMOSPHERE, SUN, SOLAR WIND, AND SPACE CONDITIONS CONTINUOUSLY WITHOUT INTERRUPTIONS DAY AND NIGHT THROUGHOUT THE YEAR.

The longest uninterrupted data measurement set is over 100 years long (since 1914) and it consists of fluctuations in the geomagnetic field. SGO has many in-house developed and built measurement instruments as well as other instruments which are operated through research cooperation. The wide range of measurement devices and networks allow for the unique possibility for a diverse and modern monitoring of the changes in the geoenvironment and space, top-tier research, and producing services for society.

The Observatory coordinates the national FIRI infrastructure Earth-Space Research Ecosystem (E2S), and operates as the

EARTH-SPACE RES	
10 ¹² km	Interstellar
10 ⁹ km	Sun
10 ⁶ km	Solar wind
10 ⁵ km	Magnetosphere
100 km	Ionosphere
50 km	Mesosphere
15 km	Statosphere
10 km	Troposphere
	Ground

Observatory coordinates national FIRI infrastructure Earth-Space Rese
EISCAT_3D in Finland, and participates to ESFRI/EPOS and FIRI/FIN-EP



PROJECTS



OBSERVATIONS



KAIRA

STRUCTURES AND DATA

home institute for the EISCAT and EISCAT_3D, and participates in the ESFRI/EPOS and FIRI/FIN-EPOS infrastructures. More information can be found from the info buttons below.

The Observatory has dedicated instruments in over twenty measurement locations from Svalbard to Antarctica. The Observatory maintains national measurement networks such as pulsation magnetometers and riometers as well as seismic network in Northern Finland. In addition, observatory-quality measurements are being performed with variometers, auroral cameras, ionosonde, neutron monitors, KAIRA radio receiver and EISCAT radar. Together with the permanent continuous measurements, SGO organises campaign observations and measurements (VLF, drones and cameras), and maintains guest observations such as the infrasound receiver and meteor radar. In the near-future the measurements will expand to orbits with the LappiSat satellite and space programme.

RESEARCH ECOSYSTEM (E2S)

Solar storms, flares
Radio disturbances



Aurora
Magnetic environment
Greenhouse gases, ozone
Radio propagation



Research Ecosystem (E2S), acts as the home institute of EISCAT and EPOS infrastructures. More information on the info buttons below.



EISCAT



EPOS



E2S



RESEARCH ACTIVITIES

The Observatory has developed strong research capabilities throughout the decades from the research themes related to the geo- and space environments. The Observatory operates in a large-scale international cooperation, and coordinates for example the thematic network **Arctic Space Hub**.

Geomagnetic and cosmic ray measurements have enabled the first Finnish space science oriented Centre of Excellence ReSoLVE that was established in 2014 along with the Centre of Excellence in Inverse Problems.

The results of the Observatory are published in high-level scientific publications and are presented regularly in scientific meetings across the world. The people of the Observatory participate actively in teaching activities, organising summer and winter schools, and in societal discussion.

Get in touch with us!

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SODANKYLÄ GEOPHYSICAL OBSERVATORY

Space Campus of Sodankylä and Linnanmaa Campus in Oulu

State-of-the-art knowhow in two campuses

- World's most comprehensive monitoring of the geoenvironment
 - Long-term monitoring and research of natural hazards
 - Services based on our own measurements
 - 24/7 monitoring and warnings of space hazards
 - Auroral research and forecasts

Securer of society's functions

Space storms affect the following: satellite-based services; navigation on land, sea, and air, communication, the function of synchronised systems, location and radio communication, power and energy distribution and services, radiation safety on-board flights above polar regions and to space, and the exploration of space.