

Center for International Collaborative Research (CICR)



- Coordinated international programs
- Ground-based observation networks and satellite projects
- Hosting international workshops
- International exchange of foreign and Japanese researchers and students
- Capacity-building courses and schools in developing countries
- Observatories

The Center for International Collaborative Research (CICR) provides leadership to promote international collaborative studies to understand the physical mechanisms of phenomena occurring in the space–Sun–Earth environmental system and their interactions. The CICR encourages programs to develop ground-based observation networks and international satellite projects and host international workshops and conferences. It also supports international exchanges between overseas and Japanese researchers and students and builds capacity in developing countries through training courses and schools. The CICR took over the Geospace Research Center of the former Solar–Terrestrial Environment Laboratory of Nagoya University. It was established in October 2015 initially for a 5-years fixed term until FY2020. However, another 5-years term (FY2021–2026) for continued activity was approved by Nagoya University.

The phenomena contained in solar activity have various timescales, from solar flares and coronal holes, to the 11-year cycle, and further long-term variations. World scientists are greatly interested in these types of solar activities and their consequences on the Earth’s geospace environment and climate change. The Scientific Committee on Solar–Terrestrial Physics (SCOSTEP), under the International Science Council (ISC), commenced a 5-year international program entitled “Predictability of the variable Solar–Terrestrial Coupling (PRESTO)” for 2020–2024. The main objective of this program is to identify the predictability of the variable solar–terrestrial coupling performance metrics using modeling, measurements, and data analysis while strengthening the communication between scientists and users. The President of SCOSTEP is also a member of the CICR and is responsible for operating this international program. On January 8, 2021, ISEE and SCOSTEP exchanged a Memorandum of Understanding to define the conditions under which ISEE will contribute to SCOSTEP activities. In agreement with this Memorandum of Understanding, the CICR publishes the SCOSTEP/PRESTO newsletter every three months, organizes online seminars and capacity-building lectures, and coordinates international symposiums related to SCOSTEP/PRESTO. The CICR also contributes to other international programs related to the space–Sun–Earth environment, such as Future Earth and the Integrated Land Ecosystem–Atmosphere Processes Study (iLEAPS). Since 2016, the CICR has participated in or operates ground-based observation projects, such as the EISCAT radar project, OMTIs, the ISEE VLF/ELF and magnetometer network, SuperDARN radar network (including the Hokkaido HF radars), and the Arctic Challenge for Sustainability operation office. It also has four domestic observatories at Moshiri, Rikubetsu, Fuji, and Kagoshima, which conduct observations of the solar wind, geomagnetic field, and upper atmosphere. Some of these observations have been conducted for more than 30 years.



Observation sites and foreign collaborative institutions of ISEE.

Main Activities in FY2021

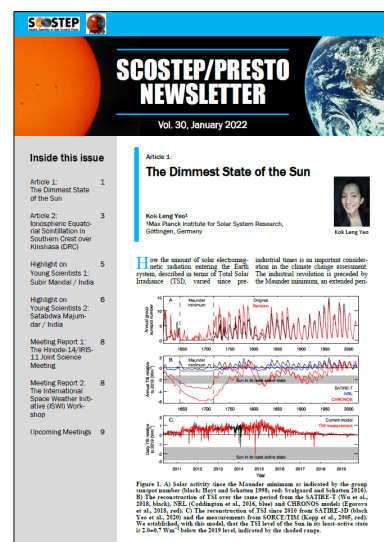
In FY2021, the CICR conducted the following international collaborative research programs: 1) Joint Research Program (international, 23 projects); 2) ISEE International Joint Research Program, inviting 15 researchers from overseas; and 3) ISEE/CICR International Workshop, including two designated professors from overseas who were hired through a 5-year cross-appointment with US universities and institutions. Four English-speaking staff members were hired to provide administrative support. However, part of programs 2) and 3) were canceled due to COVID-19. Employment of the two designated professors continued after FY2022. In program 1), the CICR conducted research to understand coupling processes in the solar-terrestrial system by overseas observation using a wide range of ground-based multipoint networks. In collaboration with SCOSTEP, the CICR hosted five international online seminars and nine online lectures for students in FY2021. It also supported two graduate students in making presentations at an international online conference. In the PRESTO program (2020–2024), the CICR published four newsletters in FY2021 (April, July, October, and January). The CICR also supported two international schools in Nigeria and Portugal. A student from Russia was invited to the ISEE for collaborative research under the SCOSTEP Visiting Scholar program. Students from Ethiopia and India were invited to the ISEE under the JSPS Core-to-Core Program.

The EISCAT radar project was undertaken in collaboration with an NIPR group, and eleven EISCAT special experiments proposed by Japanese colleagues were conducted. Discussions about the EISCAT_3D radar were organized with foreign EISCAT associate members. The PWING project continued running eight stations around the North Pole at MLATs of $\sim 60^\circ$ connecting the OMTIs, ISEE magnetometer, and ELF/VLF networks. A research project entitled “Pan-Arctic Water-Carbon Cycles (PAWCs)” was newly funded for 2019–2024. PAWCs are designed to integrate atmospheric–terrestrial water and carbon cycles in northern Eurasia, for which very limited data on the fluxes of greenhouse gases exist.

The four domestic observatories continued to operate in FY2021. The Moshiri Observatory became an unmanned observatory in FY2018, and it has continued to run electromagnetic instruments: an auroral photometer, magnetometers, and ELF/VLF receivers. Its fluxgate magnetometer and induction magnetometer were repaired in 2021. The Rikubetsu Observatory operates several spectrometers for comprehensive measurements of ozone and other minor constituents in the atmosphere, all-sky imagers and photometers for aurora and airglow monitoring, the SuperDARN Hokkaido radars for ionospheric disturbances, and an ELF atmospheric receiver.

Multi-station IPS observations using Fuji, Kiso, and Toyokawa antennas were conducted between April and December 2021. The Sugadaira station, which was one of the solar wind observatories, was closed this fiscal year. A public lecture was held on September 18, 2021, at Kiso, in collaboration with the Kiso Observatory of the University of Tokyo.

The Kagoshima Observatory and Sata Station operate an all-sky camera, a photometer for airglow detection, VLF/LF radio wave receivers, and induction magnetometers in collaboration with Tohoku University, the University of Electro-Communications, Chiba University, and Georgia Institute of Technology.



SCOSTEP/PRESTO Newsletter vol. 30 (January 2022).



Moshiri Observatory.