

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

To promote international collaborative studies to understand the physical mechanisms of phenomena occurring in the space–Sun–Earth environmental system and their interactions, ISEE established the Center for International Collaborative Research (CICR) in October 2015. The CICR provides leadership to promote internationally coordinated programs, such as those undertaken by the Scientific Committee on Solar–Terrestrial Physics (SCOSTEP) and Future Earth. The CICR encourages programs for developing ground-based observation networks and international satellite projects, and hosting of international workshops and conferences. It also supports international exchanges of overseas and Japanese researchers and students, and builds capacity in developing countries through training courses and schools. The CICR has taken over from the Geospace Research Center of the former Solar–Terrestrial Environment Laboratory of 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. SCOSTEP, under the International Science Council, 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. 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.

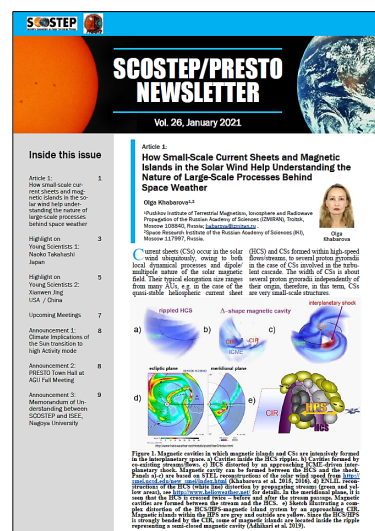
Main Activities in FY2020

In FY2020, the CICR conducted the following international collaborative research programs: 1) Joint Research Program (international, 29 projects); 2) ISEE International Joint Research Program inviting 16 researchers from overseas; and 3) an ISEE/CICR International Workshop, including two designated professors from overseas who were hired through a 5-year cross-appointment with US universities and institutions. However, programs 2) and 3) and the employment of the designated professors were postponed to FY2021 due to COVID-19. In collaboration with SCOSTEP, we published four newsletters in FY2020 (April, July, October, and January). We also published a paper summarizing VarSITI activity as an output of the VarSITI Workshop in 2019. Two students from Indonesia and Ethiopia were invited to ISEE for collaborative research under the SCOSTEP Visiting Scholar program. However, these invitations were postponed to FY2021 due to COVID-19.

The EISCAT radar project was undertaken in collaboration with an NIPR group, and seven 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 FY2020. The Moshiri Observatory became an unmanned observatory in FY2018; however, it continued to run electromagnetic instruments, that is, an auroral photometer, magnetometers, and VLF receivers. 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 a new ELF atmospheric receiver. A new induction magnetometer was installed at Rikubetsu in October 2018.

Multi-station IPS observations using the Fuji, Kiso, and Toyokawa antennas were conducted between April and December 2020. When the Kiso antenna was restored before the IPS observations started, a fire occurred in the observatory area. Fortunately, there was no serious damage to the observation facility owing to quick containment by local firefighters. The Kiso Observatory opened up to high school students on December 2, 2020. 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 Tech.



SCOSTEP/PRESTO Newsletter vol. 26 (January 2021).



Moshiri Observatory.