

Center for International Collaborative Research (CICR)



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

The Center for International Collaborative Research (CICR) was established in October 2015 under ISEE to promote international collaborative studies that attempt to understand the physical mechanisms of the phenomena occurring in the space–Sun–Earth environmental system and their interactions with each other. The CICR provides leadership to encourage and promote internationally coordinated programs, such as those carried out by the Scientific Committee On Solar–Terrestrial Physics (SCOSTEP) and Future Earth, ground-based observation networks, international satellite projects, the hosting of international workshops and conferences, the international exchange of foreign and Japanese researchers and students, and capacity building 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.

Solar activity has various times scales, including solar flares, coronal hole, the 11-year cycle, and long-term variation. Recent solar activity has been the lowest in the past 100 years. World scientists have a strong interest in these solar activities and their consequences for 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 SCOSTEP president is a member of the CICR and responsible for operating this international program. The CICR publishes a SCOSTEP/PRESTO newsletter every three months, 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). In addition to these international programs, the CICR also participates in/operates ground-based observation projects, i.e., the EISCAT radar project, OMTIs, ISEE magnetometer network, SuperDARN radar network including the Hokkaido HF radars, ISEE VLF/ELF network, and ArCS operation office.

CICR has been operating the international collaborative research programs since 2016. It also holds 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 FY2019

In FY2019, CICR conducted the following international collaborative research programs: 1) the Joint Research Program (International, 28 projects); 2) the ISEE International Joint Research Program that invited 16 foreign researchers; and 3) two ISEE/CICR International Workshops, inviting seven foreign designated professors and associate professors. Two designated professors were hired through a 5-year cross-appointment with US universities and institutions. The ISEE/CICR International Workshop aimed to facilitate comprehensive discussions on a focused topic with 10–15 attendees over one week and summarize the results into international journal papers and/or books.

Sixteen CICR colloquiums were held with senior foreign scientists from eight countries, including the US, the UK, Germany, and Australia. For the SCOSTEP VarSITI (2014–2018) and PRESTO (2020–2024) programs, we published three newsletters in FY2019, in May, December, and January. We also organized the VarSITI Summarizing Workshop in Nagoya, Japan, in November 2019 to summarize the 5-year VarSITI activities. Three young scientists from India, Argentina, and Peru were invited to ISEE for collaborative research under the SCOSTEP Visiting Scholar program.

The Nobeyama radioheliograph was shut down at the end of March 2019. Under the ICCON Project, 34 scientists from the US, the UK, China, Korea, Russia, Germany, Switzerland, Belgium, and Japan joined its operation for five years. All the data are openly available at NAOJ and CIDAS/ISEE. The EISCAT radar project was carried out in collaboration with an NIPR group; nine EISCAT special experiments proposed by Japanese colleagues were conducted. Discussions about the EISCAT_3D radar have been conducted with foreign EISCAT associate members. The PWING projects continued running eight stations around the north pole at MLATs of $\sim 60^\circ$, with links to the OMTIs, ISEE magnetometer, and ELF/VLF network projects. A research project entitled “Pan-Arctic Water-Carbon Cycles (PAWCs)” was newly funded for 2019–2024. PAWCs is designed to integrate atmospheric–terrestrial water and carbon cycles in northern Eurasia, for which very limited data on the fluxes of greenhouse gases exists.

The four domestic observatories continued to operate in FY2019. Moshiri Observatory became an unmanned observatory in FY2018, but continued running electromagnetic instruments, i.e., an auroral photometer, magnetometers, and VLF receivers. 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, and SuperDARN Hokkaido radars for ionospheric disturbances, as well as a new ELF atmospheric receiver. A new induction magnetometer was also installed at Rikubetsu in October 2018. Multi-station IPS observations using the Fuji, Kiso, and Toyokawa antennas were conducted in FY2019. The IPS antenna at Fuji were seriously damaged by snow in winter, and restored in April before the multi-station IPS observations started. The Kiso Observatory was opened to the public on August 3–4, 2019. Kagoshima Observatory and Sata Station operate instruments for electromagnetic wave detection, an all-sky camera, and a photometer for airglow detection. A new VLF/ELF wave receiver was installed at Kagoshima Observatory by Georgia Tech., USA, in November 2019 to observe electromagnetic waves from lightning.



SCOSTEP/PRESTO Newsletter vol. 21 (December 2019).



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