

10. Education

The Institute for Space–Earth Environmental Research (ISEE) primarily offers graduate programs in the Science, Engineering, and Environmental Studies schools of Nagoya University. The ISEE has its own graduate course for Heliospheric and Geospace Physics in the Division of Particle and Astrophysical Science of the Graduate School of Science. ISEE also cooperates with the Department of Electrical Engineering, through the Space Electromagnetic Environment group in the Graduate School of Engineering, and the Department of Earth and Environmental Sciences, through the Chronology and Natural History, and Global Water Cycle groups, in the Graduate School of Environmental Studies, by teaching / training graduate students in disciplines related to space–earth environmental research.

Our graduate students use various methodologies and techniques, including ground observation, fieldwork, laboratory experiments, radioactive dating, numerical simulations and modeling, and theoretical research. Their work includes the development of satellite, balloon, and aircraft instruments—and the analysis of observational data. As ISEE members conduct research that involves analyzing data captured by both domestic and international instrument platforms, and / or by collaborative research with foreign researchers, our students are actively pioneering new research fields, through their involvement with other scholars in international collaborations, and in interdisciplinary research. Their studies mature as MSc or PhD theses, which are presented at international workshops and conferences, and published in academic journals. We nurture researchers who can apply their knowledge to benefit society, who have a broad perspective, and who demonstrate an international perspective.

Staff association between the research divisions in the ISEE and the graduate schools

		Graduate School of Science					Graduate School of Engineering		Graduate School of Environmental Studies					
		Division of Particle and Astrophysical Science					Department of Electrical Engineering and Computer Science		Department of Earth and Environmental Sciences					
		Heliospheric and Geospace Physics					Electrical Engineering Course Space Electromagnetic Environment		Earth and Planetary Sciences Course Chronology and Natural History		Hydrospheric-Atmospheric Sciences Course Global Water Cycle			
		Atmospheric and Environmental Science (AM)	Space Science – Experiment (SSE)	Solar and Space Physics - Theory (ST)	Cosmic-Ray Physics (CR)	Heliospheric Plasma Physics (SW)	Space Observation	Information Engineering	Geochronology	Environmental History	Meteorology	Cloud and Precipitation Sciences	Atmospheric Chemistry	Hydroclimatology
Institute for Space–Earth Environmental Research	Integrated Studies			●			●							
	Cosmic-Ray Research				●									
	Heliospheric Research					●								
	Ionospheric and Magnetospheric Research		●				●							
	Meteorological and Atmospheric Research	●					●			●	●	●		
	Land–Ocean Ecosystem Research												●	●
	Chronological Research								●	●				
	Center for International Collaborative Research	●	●		●		●		●				●	
	Center for Intergrated Data Science			●	●		●		●		●	●		●
	Center for Orbital and Suborbital Observations	●	●		●						●	●	●	●

Number of Students Supervised by ISEE Staff

(April 1, 2019–March 31, 2020)

	M1	M2	D1	D2	D3	Undergraduate Students	Non-regular students	Total
Graduate School of Science	10	15	2	3	6	-	1 *1	37
Graduate School of Engineering	8	5	0	0	2	-	-	15
Graduate School of Environmental Studies	16	9	1	2	7	-	-	35
School of Science	-	-	-	-	-	7	-	7
School of Engineering	-	-	-	-	-	11	3*2	14
ISEE	-	-	-	-	-	-	2*2	2
Total	34	29	3	5	15	18	6	110

Cumulative total in FY 2019 *1 Special Research Student, *2 Research Student

Faculty Members

(April 1, 2019–March 31, 2020)

■ Graduate School of Science Division of Particle and Astrophysical Science

Field/Topics	Professor	Associate Professor	Lecturer	Assistant Professor
Solar-Terrestrial Environmental Science	Akira Mizuno	Tomoo Nagahama		
Solar-Terrestrial Interrelation Science	Masafumi Hirahara	Satonori Nozawa	Shin-ichiro Oyama	
		Yuichi Otsuka		
	Kanya Kusano	Satoshi Masuda		Akimasa Ieda
Solar-Terrestrial Physics	Yoshitaka Itow	Fumio Abe	Akira Okumura	Hiroaki Menjo
	Hiroyasu Tajima	Yutaka Matsubara		
		Fusa Miyake		
	Munetoshi Tokumaru	Kazumasa Iwai		Ken-ichi Fujiki

■ Graduate School of Engineering Department of Electrical Engineering and Computer Science

Field/Topics	Professor	Associate Professor	Lecturer	Assistant Professor
Space Electromagnetic Environment	Kazuo Shiokawa	Nozomu Nishitani		Taku Nakajima
		Masahito Nosé		
	Yoshizumi Miyoshi	Takayuki Umeda	Shinsuke Imada	

■ Graduate School of Environmental Studies Department of Earth and Environmental Sciences

Field/Topics	Professor	Associate Professor	Lecturer	Assistant Professor
Hydrospheric-Atmospheric Sciences Course Global Water Cycle	Kazuhisa Tsuboki	Taro Shinoda		
	Nobuhiro Takahashi	Hirohiko Masunaga		
	Michihiro Mochida			Sho Ohata
	Tetsuya Hiyama	Naoyuki Kurita	Hatsuki Fujinami	
	Joji Ishizaka	Hidenori Aiki		Yoshihisa Mino
Earth and Planetary Sciences Course Chronology and Natural History	Masayo Minami	Takenori Kato		
	Hiroyuki Kitagawa			Hiroataka Oda

Undergraduate Education

Based on demand, the faculty of the institute offers numerous undergraduate courses in the School of Science, the School of Engineering, and in other departments and at other universities in the adjacent area.

■ During the 2019 Academic Year, The Following Courses were Offered;

- Astrophysics and Space Science
- Astrophysics III
- Atmospheric and Hydrospheric Sciences
- Earth and Planetary Science Researches
- Electric Circuits with Exercise
- Electromagnetic Wave Engineering
- Environmental Earth Sciences (Geosphere Environmental Chemistry)
- Experimental Physics
- Experiments in Physics - Advanced Course
- First Year Seminar A
- Frontier of Earth and Planetary Sciences
- Fundamentals of Atmospheric and Hydrospheric Sciences
- Geochemical Analysis II and Experiments
- Geology Experiments
- Graduation Thesis A • B
- Introduction to Earth Science
- Introduction to Electrical/ Electronic and Information Engineering for Automobiles
- Introduction to Physics I, II
- Isotope Geochemistry
- Laboratory in Physics
- Mathematics 1 with Exercises A/B
- Petrology Experiments
- Physics Experiments I, II
- Probability Theory and Numerical Analysis with Exercises
- Remote sensing
- Science of Atmospheric-Hydrospheric Environment
- Solar System Science
- Technical Visits in Companies and Laboratories B
- Topics in Advanced Physics
- View of Advanced Electrical/ Electronic and Information Engineering

11. International Relations

Academic Exchange

(29 in total)

Institution	Country/Region	Establishment
Indonesian National Institute of Aeronautics and Space	Indonesia	May 31, 1988
Korean Space Weather Center	Korea	December 24, 2012
Pukyong National University, College of Fisheries Sciences	Korea	October 2, 2006
Institute of High Energy Physics, Chinese Academy of Sciences	China	February 20, 2001
Polar Research Institute of China	China	November 11, 2005
Department of Atmospheric Sciences, National Taiwan University	Taiwan	October 30, 2009
Center for Weather Climate and Disaster Research, National Taiwan University	Taiwan	September 3, 2014
Bangladesh University of Engineering & Technology, Department of Physics	Bangladesh	March 4, 2008
National Institute of Water and Atmospheric Research	New Zealand	July 26, 1989
Centre for Geophysical Research, University of Auckland	New Zealand	December 7, 1992
Faculty of Science, University of Canterbury	New Zealand	July 30, 1998
Geophysical Institute, University of Alaska Fairbanks	U.S.A.	July 16, 1990
Space Environment Center, National Oceanic and Atmospheric Administration	U.S.A.	December 15, 1992
National Geophysical Data Center, National Oceanic and Atmospheric Administration	U.S.A.	January 5, 1993
Haystack Observatory, Massachusetts Institute of Technology	U.S.A.	October 24, 1994
Center for Astrophysics and Space Sciences, University of California at San Diego.	U.S.A.	December 22, 1997
Center for Space Science and Engineering Research, Virginia Polytechnic Institute and State University	U.S.A.	January 23, 2013
Chacaltaya Cosmic Ray Observatory, Faculty of Sciences, Universidad Mayor de San Andres, La Paz	Bolivia	February 20, 1992
National Institute for Space Research	Brazil	March 5, 1997
Swedish Institute of Space Physics	Sweden	September 1, 2005 (since March 25, 1993)
Department of Geophysics, Finnish Meteorological Institute	Finland	October 21, 1994
Yerevan Physics Institute	Armenia	October 18, 1996
Institute of Cosmophysical Research and Radiowave Propagation, Far Eastern Branch, Russian Academy of Sciences	Russia	April 14, 2007
Institute of Solar-Terrestrial Physics, Siberian Branch of the Russian Academy of Sciences	Russia	October 28, 2008
Yu.G. Shafer Institute of Cosmophysical Research and Aeronomy, Siberian Branch of the Russian Academy of Sciences	Russia	November 28, 2012
The Polar Geophysical Institute, Murmansk	Russia	March 13, 2017
Korea Institute of Ocean Science and Technology, Korea Ocean Satellite Center	Korea	March 13, 2018 (since April 17, 2014)
Faculty of Science, UiT The Arctic University of Norway	Norway	May 3, 2019 (since October 8, 1993)
Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)	International Science Council	July 30, 2019

Visitor : 13 / Going Abroad : 34

Note: The List includes the academic exchanges established in the former organizations before ISEE.

Research Projects

■ Major International Collaborative Projects

(80 in total)

Research Project	ISEE Representative	Collaborating Country/Region		Collaborating Organization
Study of the Onset Mechanism of Solar Eruptions	K. Kusano	Germany	1	University of Potsdam
Observational Study of the Onset Mechanism of Solar Eruptions	K. Kusano	U.S.A China	2	New Jersey Institute of Technology University of Science and Technology of China
Study of Modeling of Solar Eruptions	K. Kusano	U.S.A.	1	Harvard-Smithsonian Center for Astrophysics
Study of Triggering Mechanism of Solar Flares	K. Kusano	U.K.	1	UCL-Mullard Space Science Laboratory
Study of Magnetic Reconnection	K. Kusano	U.K.	1	University of Manchester
Radiation Belt Storm Probes (RBSP) Project	Y. Miyoshi	U.S.A	1	NASA, JHUAPL
Modeling Study of Inner Magnetosphere	Y. Miyoshi	U.S.A	1	Los Alamos National Laboratory
Collaborative study on ERG project	Y. Miyoshi	Taiwan	1	Institute of Astronomy and Astrophysics, Academia Sinica
International Heliophysics Data Environment Alliance	Y. Miyoshi	U.S.A Europe (Member States of ESA)	23	NASA (SPDF, SDAC, HPDE, SPASE, CCMC) European Space Agency (ESA), CNES
Solar Researches with Nobeyama Radioheliograph	S. Masuda	U.S.A. China Korea Russia U.K. Germany Switzerland Belgium	8	GSFC/NASA, Catholic University of America, New Jersey Institute of Technology National Astronomical Observatories, Chinese Academy of Sciences, Shandong University KASI, Russian Academy of Sciences University of Warwick Georg-August-Universität Göttingen University of Applied Sciences and Arts Northwestern Switzerland Katholieke Universiteit Leuven
Study in Interaction of Very High Energy Cosmic Rays by Using Large Hadron Collider	Y. Itow	Italy France Switzerland U.S.A.	4	University of Florence, Catania University École Polytechnique CERN Lawrence Berkeley National Laboratory
Study in Cosmic Neutrinos by Using a Large Water Cherenkov Detector	Y. Itow	U.S.A. Canada U.K. Spain Korea China Poland	7	Boston University, Brookhaven National Laboratory, UCI, Duke University, George Mason University, University of Hawaii, Indiana University, Los Alamos National Laboratory, University of Maryland, State University of New York, University of Washington University of British Columbia, University of Toronto, TRIUMF Queen Mary University of London, Imperial College London, University of Liverpool, University of Oxford, University of Sheffield Complutense University of Madrid Chonnam National University, Seoul National University, Sungkyunkwan University Tsinghua University University of Warsaw

Research Project	ISEE Representative	Collaborating Country/Region	Collaborating Organization
Study of Dark Matter and Solar Neutrinos Using a Liquid Xenon Detector	Y. Itow	Korea	1 Seoul National University, Sejong University, Korea Research Institute of standards and Science
Study in Interaction of Very High Energy Cosmic Rays by Using Relativistic Heavy Ion Collider	Y. Itow	Italy U.S.A.	2 University of Florence, Catania University Brookhaven National Laboratory
Research and Development for the Next Generation Water Cherenkov Detector, Hyper-Kamiokande	Y. Itow	U.S.A. Korea China U.K. Italy France Switzerland Spain Poland Brazil <i>Canada, Russia Portugal</i>	13 Boston University, Brookhaven National Laboratory, UCI, Duke University, George Mason University, Indiana University, University of Hawaii, Los Alamos National Laboratory, University of Maryland, State University of New York, University of Washington Chonnam National University, Seoul National University, Sungkyunkwan University Tsinghua University Imperial College London, Lancaster University, University of Oxford, Queen Mary University of London, University of Sheffield, Rutherford Appleton Laboratory INFN Sezione di Bari, INFN Sezione di Napoli, INFN Sezione di Padova, INFN Sezione di Roma CEA Saclay, École Polytechnique University of Bern, Swiss Federal Institute of Technology Zurich Autonomous University of Madrid University of Warsaw University of São Paulo <i>and other Institutions</i>
Study of Dark Matter and Solar Neutrinos Using a 2-phase Liquid Xenon TPC Detector	Y. Itow	Germany Italy Switzerland U.S.A Sweden Israel Portugal <i>France, UAE, Netherlands</i>	10 Max-Planck-Institut, Albert-Ludwigs-Universität Freiburg INFN, Università di Bologna University of Zurich Columbia University, University of Chicago, Purdue University, UCSD Stockholms universitet Weizmann Institute of Science Universidade de Coimbra <i>and other institutions</i>
Research on Origin of Cosmic Rays with CTA (Cherenkov Telescope Array)	H. Tajima	Germany France Italy Spain Switzerland U.K. U.S.A. <i>Brazil, Argentina, Poland, Armenia, Australia, Czech, Bulgaria, Croatia, Finland, Greece, Sweden Slovenia, India, Ireland, South Africa</i>	22 Deutsches Elektronen-Synchrotron, Max-Planck-Institut, Heidelberg University CENS, École Polytechnique, University of Paris INFN, IFSI University of Barcelona, Complutense University University of Zürich Durham University, University of Leicester, University of Leeds SLAC National Accelerator Laboratory, Argonne National Laboratory, University of Washington, Iowa State University, UCLA, UCSC, University of Chicago, Smithsonian Observatory <i>and other institutions</i>

Research Project	ISEE Representative	Collaborating Country/Region		Collaborating Organization
Research on Origin of Cosmic Rays with Fermi Satellite	H. Tajima	U.S.A. France Italy Sweden	4	Stanford University, SLAC National Accelerator Laboratory, GSFC/NASA, U.S. Naval Research Laboratory, UCSC, Sonoma State University University of Washington, Purdue University, Ohio State University, University of Denver CENS, CNRS, École Polytechnique INFN, Italian Space Agency, IFSI Royal Institute of Technology, Stockholm University
Solar Flare Research with Hard X-ray Spectral Imaging Observations	H. Tajima	U.S.A.	1	UCB, MSFC/NASA, Air Force Research Laboratory
Solar Flare Research with Gamma-ray Spectral Imaging Observations with Polarimetry	H. Tajima	U.S.A.	1	UCB, Lawrence Berkeley National Laboratory, GSFC/NASA
Study of Solar Neutrons	Y. Matsubara	Bolivia Armenia China Mexico	4	Research Institute of Physics, University of San Andrés Yerevan Physics Institute Institute of High Energy Physics, Chinese Academy of Sciences National Autonomous University of Mexico
Search for Cosmic-ray Excursions in the Past by Single-year Measurements of ¹⁴ C in Tree Rings	F. Miyake	U.S.A. Switzerland	2	The University of Arizona Swiss Federal Institute of Technology
A Search for Dark Objects Using the Gravitational Microlensing Effect	F. Abe	New Zealand U.S.A.	2	University of Auckland, University of Canterbury, Victoria University of Wellington, Massey University University of Maryland, NASA
Observations of Interplanetary Disturbances Using the International IPS Network	M. Tokumaru	U.K. Russia India Mexico Australia	5	LOFAR-UK Lebedev Physical Institute Tata Institute of Fundamental Research National Autonomous University of Mexico Murchison Widefield Array
Study of 3-D Solar Wind Structure and Dynamics Using Heliospheric Tomography	M. Tokumaru	U.S.A.	1	CASS/UCSD
Study on the Application of Interplanetary Scintillation Observations to Space Weather Forecast	M. Tokumaru	Korea	1	Korean Space Weather Center
Study of the Heliospheric Boundary Region Using Observations of Interplanetary Scintillation	M. Tokumaru	U.S.A.	1	Interstellar Boundary Explorer, IMAP
Research and Development of the Plasma/Particle Instrument Suite for the Mercury Magnetospheric Exploration Mission	M. Hirahara	France Sweden U.K. U.S.A. Switzerland	5	CESR-CNRS, CETP-IPSL Institute for Solar Physics of the Royal Swedish Academy of Sciences Rutherford Appleton Laboratory Boston University University of Bern
Future Satellite Mission for the Terrestrial Magnetosphere-Ionosphere-Thermosphere Explorations by Formation Flight Observations and its Feasibility Study and Collaboration of the Satellite and Ground-Based Observations	M. Hirahara	Sweden	1	Swedish Institute of Space Physics (IRF), Swedish National Space Board
Study on Science Subjects and Developmental Techniques of Observational Instruments toward Future Spacecraft Exploration Missions for the Space-Earth Coupling System	M. Hirahara	U.S.A. Canada Sweden	3	University of Colorado Boulder, UCB University of Calgary Swedish Institute of Space Physics (IRF)
VarSITI (Variability of the Sun and Its Terrestrial Impact)	K. Shiokawa	U.S.A., France, Germany, U.K., Italy, Canada, Australia, India, China, and <i>other countries</i>	9	SCOSTEP

Research Project	ISEE Representative	Collaborating Country/Region		Collaborating Organization
High-Sensitive Imaging Measurements of Airglow and Aurora and electromagnetic waves in Canadian Arctic	K. Shiokawa	U.S.A. Canada	2	University of California, Augsburg College Virginia Polytechnic Institute and State University University of Calgary, Athabasca University
Magnetic Conjugate Observations of Midlatitude Thermospheric Disturbances	K. Shiokawa	Australia	1	Radio and Space Service/IPS
Comparison of Dynamical Variations of the Mesosphere, Thermosphere, and Ionosphere between Asian and Brazilian Longitudes	K. Shiokawa	Brazil	1	INPE
Ground and Satellite Measurements of Geospace Environment in the Far-Eastern Russia	K. Shiokawa	Russia	1	Institute of Cosmophysical Research and Radiowave Propagation, Far Eastern Branch, RAS
Observations of the Equatorial Ionosphere in South-East Asia and West Africa	K. Shiokawa	Nigeria Cote d'Ivoire	3	National Space Research and Development Agency, Federal University of Technology, Akure Université Félix Houphouët-Boigny
Observations of Waves and Particles in the Inner Magnetosphere in the Siberian Region of Russia	K. Shiokawa	Russia	1	IKFIA/SB RAS, ISTP/SB RAS
Collaborative Research and Operation in the Field of Space Weather Observations	Y. Otsuka	Indonesia	1	LAPAN
Observations and researches of ionosphere and upper atmosphere in Thailand	Y. Otsuka	Thailand	1	Chiang Mai University, King Mongkut's Institute of Technology Ladkrabang
Study of the Polar Upper Atmosphere Using the EISCAT Radars and Other Instruments	S. Nozawa	Norway Sweden, Finland, Germany, U.K., China	6	UiT The Arctic University of Norway EISCAT Scientific Association
Derivation of substorm index from low-latitude geomagnetic field data	M. Nosé	Australia Turkey Germany Spain Denmark U.S.A.	6	Geoscience Australia Boğaziçi University Ludwig-Maximilians-Universität München Universitat Ramon Llull Technical University of Denmark United States Geological Survey (USGS)
Study of the Polar/Midlatitude Ionosphere and Magnetosphere Using the SuperDARN HF Radar Network	N. Nishitani	U.S.A. U.K. France South Africa Australia Canada Italy Russia China	9	JHUAPL, Virginia Polytechnic Institute and State University University of Leicester LPC2E/CNRS University of KwaZulu-Natal La Trobe University University of Saskatchewan IFSI ISTP/SB RAS Polar Research Institute of China
SDI-3D project: Development of SDI	S. Oyama	U.S.A Finland Sweden	3	Geophysical Institute/UAF University of Oulu, Finnish Meteorological Institute, Sodankylä Geophysical Observatory, Lappeenranta-Lahti University of Technology The Swedish Institute of Space Physics (IRF), KTH Royal Institute of Technology
Study of Auroral Energetic Electron Precipitation (EEP) Impacts on the Upper/Middle Atmosphere	S. Oyama	Finland New Zealand U.K. Norway U.S.A.	5	Sodankylä Geophysical Observatory, University of Oulu, Finnish Meteorological Institute University of Otago British Antarctic Survey University Centre in Svalbard University of Alaska Fairbanks
Study of aerosols and atmospheric trace gases by using SAVER-Net observation network in South America	A. Mizuno	Argentina Chile	3	CEILAP, Servicio Meteorológico Nacional Argentina University of Magallanes (UMAG), Dirección Meteorológica de Chile

Research Project	ISEE Representative	Collaborating Country/Region		Collaborating Organization
		Bolivia		University of La Frontera, Universidad Mayor de San Andrés
High Energy Particles in Geospace: the Acceleration Mechanism and the Role in Earth's Climate	A. Mizuno	U.S.A. Norway Sweden	3	University of Colorado Boulder, UCLA, University of Arizona UiT The Arctic University of Norway EISCAT Scientific Association
Source Apportionment of Organic Aerosols in Beijing	M. Mochida	China	1	Tianjin University
Characterizing Organics and Aerosol Loading over Australia (COALA)	M. Mochida S. Ohata	Australia U.S.A. U.K	3	University of Wollongong, CSIRO, ANSTO, NSW Department of Planning, Industry, and Environment Georgia Institute of Technology, UCI Lancaster University
Tropical Rainfall Measuring Mission	N. Takahashi	U.S.A.	1	NASA
Global Precipitation Measurement Mission (GPM)	H. Masunaga N. Takahashi	U.S.A.	1	NASA
Tropical Cyclones-Pacific Asian Research Campaign for Improvement of Intensity Estimations/Forecasts (T-PARCI)	K. Tsuboki T. Shinoda	Taiwan	1	National Taiwan University Atmospheric Sciences
Advanced Study on Precipitation Enhancement in Arid and Semi-Arid Regions	M. Murakami	United Arab Emirates	1	National Centre of Meteorology, Khalifa University
Study on tropical convective-radiative interactions	H. Masunaga	France	1	Laboratoire de Meteorology Dynamique/CNRS
Study on tropical-subtropical atmospheric dynamics	H. Masunaga	U.S.A.	1	University of Miami
Observational study on convective self-aggregation	H. Masunaga	U.K.	1	University of Reading
Aircraft observation of aerosols and clouds in the Arctic	S. Ohata	Germany	1	Alfred Wegener Institute for Polar and Marine Research
Long-term observation of black carbon aerosols in the Arctic	S. Ohata	Norway U.S.A Canada Russia	4	Norwegian Polar Institute National Oceanic and Atmospheric Administration Government of Canada Arctic and Antarctic Research Institute
Continuous Observation of Methane at a Paddy Field in Northern India	Y. Matsumi	India	1	University of Delhi
Observation of PM2.5 in Hanoi	Y. Matsumi	Vietnam	1	Hanoi University of Science and Technology
Observation of PM2.5 in Ulan Bator	Y. Matsumi	Mongolia	1	National University of Mongolia
Validation of GOCI Products and Application to Environmental Monitoring of Japanese Coastal Waters	J. Ishizuka	Korea	1	Korea Institute of Ocean Science and Technology
Collection of Validation Dataset of GCOM-C Coastal Products	J. Ishizuka	Korea U.S.A. Taiwan Thailand China Estonia	6	Korea Institute of Ocean Science and Technology Columbia University, East Carolina University National Cheng Kung University Burapha University First Institute of Oceanography, Nanjing, University of Science and Technology University of Tartu
Sea Surface Nitrate and Nitrate Based New Production - two innovative research products from SGLI on board GCOM-C	J. Ishizuka	U.S.A.	1	Columbia University
Validation of ocean color products in the western North Pacific and Japanese coastal waters: Collaboration with JAXA GCOM-C project	J. Ishizuka	Member States of EUMETSAT: Germany, UK, France, Italy, Spain, Netherlands <i>and others countries</i>	30	European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)

Research Project	ISEE Representative	Collaborating Country/Region		Collaborating Organization
Investigating the optical characteristics of red tides in the upper Gulf of Thailand	J. Ishizaka	Thailand	1	University of Burapa, Kasetsart University
Integrated Land Ecosystem - Atmosphere Processes Study (iLEAPS), one of the Global Research Projects (GRPs) of the Future Earth	T. Hiyama	U.K., India, Finland, New Zealand, China, Korea <i>and others countries</i>	6	iLEAPS/Future Earth
Observational Study of Vegetation, Energy and Water in Eastern Siberia Towards Elucidation of Climate and Carbon Cycle Changes	T. Hiyama	Russia	1	Institute for Biological Problems of Cryolithozone /SB RAS
Arctic Challenge for Sustainability (ArCS) Project	T. Hiyama	U.S.A.	1	International Arctic Research Center of the University of Alaska Fairbanks (IARC)
Estimating Permafrost Groundwater age in Central Mongolia	T. Hiyama	Mongol	1	Institute of Geography and Geoecology of the Mongolian Academy of Sciences
Study of methane flux observation in Eastern Siberia and the obtained data analysis	T. Hiyama	Russia	1	Institute for Natural Science, North Eastern Federal University
Study of Equatorial Waves in the Atmosphere and Ocean	H. Aiki	Germany	1	GEOMAR Helmholtz Centre for Ocean Research Kiel
An international study on precipitation variability in high-altitude areas of the Himalayas in Nepal	H.Fujinami	Nepal	1	Kathmandu University, Nepal Academy of Science and Tecnology, International Centre for Integrated Mountain Development
Asian Precipitation Experiment (AsiaPEX)	H.Fujinami	India Nepal China Korea Bangladesh	5	India Meteorological Department, Indian Institute of Tropical Meteorology, University of Rajasthan International Centre for Integrated Mountain Development, Nepal Academy of Science and Tecnology, Kathmandu University Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Tsinghua University Pusan National University <i>and other institutions</i>
Climate change reconstruction of the Central Highlands in Vietnam	H. Kitagawa	Vietnam	1	Vietnam Academy of Science and Technology
International Continental Scientific Drilling Program - Dead Sea Deep Drilling Project (ICDP-DSDDP)	H. Kitagawa	Israel U.S.A Germany Switzerland	3	Geological Survey of Israel, Hebrew University of Jerusalem Columbia University, University of Minnesota GFZ Helmholtz Centre Potsdam, Max-Planck-Institute Mainz for Chemistry Université de Genève
Study of Grand-Water Circulation Based on ¹⁴ C Ages of Underground Water and Hot-Spring Water Samples from Korea	M. Minami	Korea	1	Korea Institute of Geoscience and Mineral Resources (KIGAM)
Climate reconstruction using travertine from Takht-e-Soleyman area in Kurdistan, Iran	M. Minami	Iran	1	University of Kurdistan
Geochronological Research on the Basement Rocks in Japan and Korea	T. Kato	Korea	1	Korea Institute of Geoscience and Mineral Resources (KIGAM)
Development of New Analytical Techniques and Accurate Quantification of Electron Microprobe Analysis	T. Kato	Korea	1	Pusan National University (PNU)
International Ocean Discovery Program (IODP) Expedition 379: Amundsen Sea West Antarctic Ice Sheet History	M. Yamane	U.S.A	10	University of Houston, Texas A&M University, Appalachian State University, U.S. Army Engineer Research and Development Center, The University of Massachusetts, University of South Florida, Montclair State University,

Research Project	ISEE Representative	Collaborating Country/Region	Collaborating Organization
		Germany U.K. France Sweden Norway China Korea India New Zealand	University of Florida, Northern Illinois University, Colorado College Alfred Wegener Institute for Polar and Marine Research, Christian-Albrechts-Universität zu Kiel, Universität Bremen, Museum für Naturkunde University of Southampton, University of Birmingham, British Antarctic Survey Université de Perpignan Stockholms universitet UiT The Arctic University of Norway China University of Geosciences, Tongji University Korea Institute of Geoscience & Mineral Resources National Centre for Antarctic and Ocean Research GNS Science

Visitors from Foreign Institutes

(April 1, 2019–March 31, 2020)

Country/Region			
Asia (8)	India	22	106
	Indonesia	4	
	Korea	19	
	Singapore	3	
	Taiwan	5	
	China	49	
	Nepal	3	
	Bangladesh	1	
North America (2)	Canada	4	103
	USA	99	
Latin America and the Caribbean (4)	Argentina	1	4
	Jamaica	1	
	Brazil	1	
	Peru	1	
Europe (17) (Including New Independent States)	Italy	2	102
	England	23	
	Austria	1	
	Croatia	1	
	Switzerland	6	
	Sweden	3	
	Spain	2	
	Czech	14	
	Germany	14	
	Norway	11	
	Hungary	2	
	Finland	5	
	France	4	
	Bulgaria	2	
	Belgium	3	
	Poland	2	
Russia	7		
Oceania (2)	Australia	6	8
	New Zealand	2	
Middle East (2)	Israel	1	2
	Iran	1	
Africa (1)	Nigeria	1	1
Total	31	326	

Funding Source	
Government-funding	52
Nagoya University	74
Self-funding	184
Others	16
Total	326

Purpose	
Academic Conference, Symposium	246
Joint Research	62
Training	2
Others	16
Total	326

Seminars by Foreign Visitors**(34 in total)**

Date	Name	Affiliation	Title	Number of Participant
April 4, 2019	Vania Jordanova*	Los Alamos National Laboratory, USA	46th ISEE/CICR colloquium/ Geomagnetic Storms: New Insights from Multi-Spacecraft Observations and Self-Consistent Simulations	21
April 19, 2019	Ava Maxam	Coastal Dynamics Modelling Laboratory, Mona GeoInformatics Institute, University of the West Indies, Jamaica	Special Seminar/ Coastal modeling studies of Mona GeoInformatics Institute, the University of the West Indies, Jamaica	10
April 23, 2019	Lynn M. Kistler*	University of New Hampshire, USA	47th ISEE/CICR colloquium/ The Development of the Storm-Time Ring Current, and Its Effects on Wave Generation	31
June 14, 2019	Jing Chen	Kyoto University/ Prof. at Indian Institute of Geomagnetism, India	48th ISEE/CICR colloquium/ Kinetic Alfvén waves in space plasmas	12
June 18, 2019	Satyavir Singh	Nanyang Technological University, Singapore	49th ISEE/CICR colloquium/ Atmospheric processing promotes the water uptake by organic-rich biomass burning particles in Southeast Asia	10
June 26, 2019	Rangaiah Kariyappa*	Indian Institute of Astrophysics, India	50th ISEE/CICR colloquium/ Coronal & Photospheric Magnetic Features from Spatially Resolved Images to Understand EUV & UV Solar Irradiance Variability & their impacts on Earth's Climate and Space Weather	17
July 3, 2019	Linda Sugiyama	MIT, USA	Special Seminar/ Coronal loop model and ideal MHD quasi-interchange model	17
July 4, 2019	Boris Kozelov	Polar Geophysical Institute, Russia	Japan-Russia bilateral project seminar/ Information about ionosphere-magnetosphere plasma: extracting from optical and VLF observations	10
July 4, 2019	Andrei Demekhov	Polar Geophysical Institute, Russia	Japan-Russia bilateral project seminar/ Comparison of spacecraft data on quasi-periodic VLF emissions with the flow cyclotron maser model	10
July 18, 2019	Stephen Playfer*	University of Edinburgh, UK	51th ISEE/CICR colloquium/ Hyper-Kamiokande & the future of neutrino physics	11
July 18, 2019	K. D. Leka*	Senior Research Scientist at NorthWest Research Associates, USA	52th ISEE/CICR colloquium/ Results from the ISEE/CICR Workshop, "Benchmarks for Operational Flare Forecasting" and Future Prospects	19
August 7, 2019	J.-P. St-Maurice*	University of Saskatchewan, Canada/ University of Western Ontario, Canada	Special Seminar/ What are STEVE?	20
August 29, 2019	Vanessa Polito	Lockheed Martin Solar and Astrophysics Laboratory, USA	Solar Seminar/ UV spectroscopy of solar flares: some recent insights from IRIS and EIS	7
September 19, 2019	J.-P. St-Maurice*	University of Saskatchewan, Canada/ University of Western Ontario, Canada	53th ISEE/CICR colloquium/ E region phenomena and what they reveal about ionospheric processes	14
September 24, 2019	Mariko Oue	Stony Brook University, USA	54th ISEE/CICR colloquium/ Ka-band Radar Polarimetric and Doppler Spectrum Measurements for Snowbands Along the U.S. Northeast Coast	22
September 25, 2019	Seth Claudepierre	Aerospace Corporation & UCLA, USA	55th ISEE/CICR colloquium/ Empirically estimated electron lifetimes in the Earth's radiation belts	15

Date	Name	Affiliation	Title	Number of Participant
October 3, 2019	Abraham Chian*	University of Adelaide, Australia/ National Institute for Space Research (INPE), Brazil	56th ISEE/CICR colloquium/ Nonlinear Dynamics of Space-Earth Environment	25
October 17, 2019	Gilda de Lourdes Gonzalez*	National University of Tucuman, Argentina	Division for Ionospheric and Magnetospheric Research Seminar/ Ionospheric studies in Tucum - Argentina	34
October 17, 2019	Artem Yu Gololobov*	North-Eastern Federal University, Russia	Division for Ionospheric and Magnetospheric Research Seminar/ Conjugate measurements of the SAR-arc detachment from the auroral oval using DMSP satellites and an all-sky camera at Athabasca, Canada	34
October 23, 2019	Samuel Krucker*	University of Applied Sciences Northwestern Switzerland, Switzerland/ Space Science Laboratory, University of California, Berkeley, USA	57th ISEE/CICR colloquium/ Solar X-ray Observations with NuSTAR	15
October 30, 2019	Baolin Tan	National Astronomical Observatories of China, China	58th ISEE/CICR colloquium/ Radio precursors of solar flare	15
October 31, 2019	Edith Liliana Macotela Cruz	University of Oulu	Division for Ionospheric and Magnetospheric Research Seminar/ Disturbances Observed in the VLF signal propagate in the Earth-ionosphere waveguide	37
October 31, 2019	Ram Singh*	Indian Institute of Geomagnetism, India	Division for Ionospheric and Magnetospheric Research Seminar/ Prompt penetration and Disturbance dynamo electric and their impact on equatorial and low latitude ionosphere	37
November 6, 2019	Abraham Chian*	University of Adelaide, Australia/ National Institute for Space Research (INPE), Brazil	Solar Seminar/ Magnetic reconnection and intermittent turbulence in solar corona and solar wind	8
November 14, 2019	Abraham Chian*	University of Adelaide, Australia/ National Institute for Space Research (INPE), Brazil	Division for Ionospheric and Magnetospheric Research Seminar/ Role of pre-reversal enhancement in the generation of equatorial plasma bubble using observation and model simulations	36
November 15, 2019	Aaron Hendry	Czech Academy of Science	Special Seminar/ EMIC-driven sub-MeV electron precipitation: evidence, theory, and future research	12
November 20, 2019	Stanislav Gunar	Astronomical Institute of the Czech Academy of Sciences	Solar Seminar/ Modelling of entire prominences with their multiple fine structures: the 3D Whole-Prominence Fine Structure models	18
January 9, 2020	Viswanathan Lakshmi Narayanan*	The Arctic University of Norway, Norway	Division for Ionospheric and Magnetospheric Research Seminar/ A discussion of midlatitude ionospheric instabilities and associated spread F	36
January 9, 2020	Tulasiram Sudarsanam*	Indian Institute of Geomagnetism, India	Division for Ionospheric and Magnetospheric Research Seminar/ A new Artificial Neural Network based 3D Ionospheric Model (ANNIM-3D) - Discussion	36
January 31, 2020	D. Knipp	University of Colorado, Boulder	59th ISEE/CICR colloquium/ Reconstructing Large Scale Field Aligned Currents from Short Segments of AMPERE Data	20
February 6, 2020	Iskhaq Iskandar	University of Sriwijaya, Palembang, South Sumatera, Indonesia	60th ISEE/CICR colloquium/ Recent Progress on the Study of Satellite-Observed Surface Chlorophyll-a Variability within the Indonesian Waters and Its Relation to Physical Environmental Changes	14
February 20, 2020	Hiroatsu Sato*	German Aerospace Center, Germany	Division for Ionospheric and Magnetospheric Research Seminar/ Recent advances in ionospheric density imaging with spaceborne synthetic aperture radar	27

11. International Relations

Date	Name	Affiliation	Title	Number of Participant
February 20, 2020	Matthias Förster	GFZ German Research Centre for Geosciences, Germany / Max-Planck-Institute for Solar System Research (MPS), Germany	61st ISEE/CICR colloquium/ Symmetries and asymmetries of the Earth's magnetic field and their implications for the magnetosphere-ionosphere-thermosphere (M-I-T) coupling	15
February 25, 2020	S. Gupta	Tata, India	Seminar on STP topics at Grape-3 air shower experiment/ "STP topics at Grape-3 air shower experiment	10

* Foreign Visiting Staff

<Abbreviations>

ANSTO	Australia Nuclear Science and Technology Organization
CNES	Centre National D'Etudes Spatiales
CNRS: CESR: LPC2E:	Centre National de la Recherche Scientifique Centre d'Etude Spatiale des Rayonnements Laboratoire de Physique et Chimie de l'Environnement et de l'Espace
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EISCAT:	European Incoherent Scatter Scientific Association
IBEX:	Interstellar Boundary Explorer
IFSI:	Istituto di Fisica dello Spazio Interplanetario
IMAP:	Interstellar Mapping and Acceleration Probe
INFN:	Istituto Nazionale di Fisica Nucleare
RAS:	Russian Academy of Sciences
IPS:	Ionospheric Prediction Services
IPSL: CETP:	Institut Pierre-Simon Laplace Centre d'étude des environnements terrestres et planétaires
JHUAPL:	Johns Hopkins University Applied Physics Laboratory
KASI:	Korea Astronomy and Space Science Institute
LAPAN:	Lembaga Penerbangan dan Antariksa Nasional, National Institute of Aeronautics and Space
LOFAR:	Low Frequency Array
MWA:	Murchison Widefield Array
NASA: CCMC: GSFC: HPDE MSFC: SDAC: SPASE: SPDF:	National Aeronautics and Space Administration Community Coordinated Modeling Center Goddard Space Flight Center High Performance Driving Education Marshall Space Flight Center Solar Data Analysis Center Space Physics Archive Search and Extract Space Physics Data Facility
SCOSTEP:	Scientific Committee on Solar Terrestrial Physics
SLAC:	Stanford Linear Accelerator Center
UCB:	University of California, Berkeley
UCI:	University of California, Irvine
UCLA:	University of California, Los Angeles
UCSC:	University of California, Santa Cruz
UCSD: CASS:	University of California, San Diego Center for Astrophysics and Space Sciences
UiT:	University of Tromsø

12. Outreach

Public Lectures, Open Labs, and School Visits

ISEE members contributed to public education through 22 lecture visits, three public lectures at Nagoya University, two open laboratory events, two public laboratory demonstrations, one field trip for children, six high-school student visits, three summer internship programs, and three training courses for young researchers.

ISEE held open laboratory sessions and special lectures for the public on June 15 and 16 during the 2019 Nagoya University Festival, and a half-day public lecture meeting on October 19, 2019 during the 2019 Nagoya University Home Coming Day 2019.

ISEE and the former STEL have maintained a close relationship with the town of Rikubetsu in Hokkaido since 2003. Public lectures were held on November 8, 2019 at Rikubetsu Elementary School and Rikubetsu Junior High School. Public laboratory demonstrations were presented on November 9, 2019 at the Rikubetsu Space Earth Science Museum.

ISEE distributes a series of booklets that answer 50 questions on various topics, as well as informative comic books related to space–Earth subjects for the public.

An English version of the video introducing ISEE for young students and the public was produced, and is available on the ISEE website (<http://www.isee.nagoya-u.ac.jp/>).

The ISEE website continues to publish the most up-to-date activities and outcomes of laboratory science to the public. The digitized booklet series can also be browsed at this site.



Public lecture on the ISEE open laboratory (June 15, 2019).

Addresses of Facilities

Location		Name	Address	TEL/FAX
Nagoya	①	ISEE Research Institutes Buildings I/II	Furo-cho, Chikusa-ku, Nagoya, Aichi 464-8601	TEL:+81-52-747-6303 FAX:+81-52-747-6313
Toyokawa	②	Toyokawa Branch	3-13 Honohara, Toyokawa-shi, Aichi 442-8507	TEL:+81-533-89-5206 FAX:+81-533-86-3154
Hokkaido	③	Moshiri Observatory	Moshiri, Horokanai, Uryu, Hokkaido 074-0741	TEL:+81-165-38-2345 FAX:+81-165-38-2345
	④	Rikubetsu Observatory	Uenbetsu, Rikubetsu-cho, Ashoro-gun, Hokkaido 089-4301	TEL:+81-156-27-8103
58-1, 78-1, 78-5, 129-1, 129-4 Pontomamu, Rikubetsu-cho, Ashoro-gun, Hokkaido 089-4300			TEL:+81-156-27-4011	
Yamanashi	⑤	Fuji Observatory	1347-2 Fujigane, Fujikawaguchiko-machi, Minamitsuru-gun, Yamanashi 401-0338	TEL:+81-555-89-2829
Kagoshima	⑥	Kagoshima Observatory	3860-1 ShimoHonjo Honjo, Tarumizu-shi, Kagoshima 891-2112	TEL:+81-994-32-0730

