



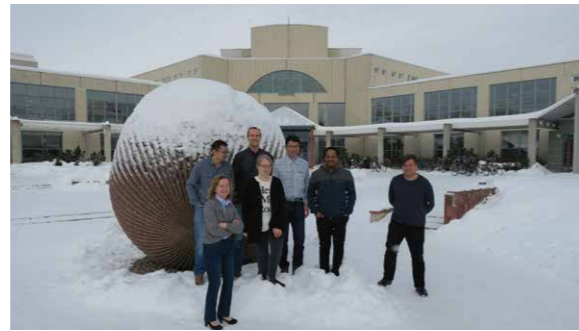
PSTEP (Project for Solar-Terrestrial Environment Prediction) Summer School RIKUBETSU



The optical counter part of a gravitational-wave event (left) imaged by the MOA II telescope



Aerial photography of the IPS radio telescope at the Kiso observatory



Began cross appointment with the University of Oulu, Finland



Ka-band polarization radar



Estimating permafrost thawing rate at Mongolia using a drone and spring water analyses



A graduate student (joint researcher) making a sample preparation for ¹⁴C measurement



ISEE introduction video has been created

Institute for Space–Earth Environmental Research,
Nagoya University

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Institute for Space–Earth Environmental Research, Nagoya University

Annual Report

FY2017



Institute for Space–Earth Environmental Research Nagoya University

Annual Report



FY2017

Institute for
Space–Earth Environmental Research
Nagoya University

Annual Report



April 2017–March 2018

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1. Foreword

The Institute for Space–Earth Environmental Research (ISEE) was launched in October 2015 by merging three institutes of Nagoya University: the Solar Terrestrial Environment Laboratory, the Center for Hydrospheric Atmospheric Research, and the Center for Chronological Research. These research institutes have been at the forefront of scientific research in their specific research disciplines. With the merging of the three institutes, the ISEE functions as a new center for interdisciplinary space–Earth research. The mission of the ISEE is to clarify the mechanisms and mutual relationships of the Earth, the Sun, and cosmic space, treating them as a seamless system and to benefit



humanity by resolving issues in the global environment and contributing to the advances of space exploration. To this end, the institute has pursued collaborative research efforts with related facilities to develop integrated research opportunities. In particular, the ISEE plays an important role as the Joint Usage and Joint Research Centers in Japan through the following various programs, the International Research Program, the ISEE International Joint Research Program, and the ISEE/CICR International Workshop. We also engage in broader efforts such as general collaboration, student encouragement, symposiums, computing infrastructure, database management, accelerator mass spectrometry analysis, and carbon 14 analysis service research. In FY 2017, 270 research projects were conducted under this framework, with many exciting outcomes and new results.

The ISEE continues to actively promote international collaborative research. This year, 219 foreign researchers were invited to carry out joint research and seminars both inside and outside of the institute. The ISEE hosted international workshops in which experts from around the world were invited to intensively discuss topical issues and publish international coauthored papers. In FY 2017, the ISEE hosted two international workshops on the Benchmarks for Operational Solar Flare Forecasts and the Prediction of Solar Cycle 25. International joint research activity is expected to be a valuable step in future research development.

This year, we established the ISEE Award to foster a new type of interdisciplinary research. The ISEE Award recognizes excellent ISEE collaborative research. Nominations are accepted regardless of affiliation or nationality. Based on a wide range of recommendations from many related communities, the first winner of the ISEE Award will be determined based on strict selection guidelines. It is our hope that the ISEE Award will encourage the development of future space–Earth environmental research.

The ISEE is organized by basic research divisions, consisting of seven research groups and three centers: the Center for International Collaborative Research, the Center for Integrated Data Science, and the Center for Orbital and Suborbital Observation. The ISEE is currently promoting four interdisciplinary research projects: the Project for Solar-Terrestrial Climate Research, the Project for Space–Earth Environmental Prediction, the Project for the Interaction of Neutral and Plasma Atmosphere, and the Project for Aerosol and Cloud Formation. These projects are being carried out in cooperation with nationwide collaborative research supported by the Grant-in-Aid for Scientific Research program of the Ministry of

Education, Culture, Sports, Science and Technology (MEXT). For example, the Aerosol and Cloud Formation group completed Japan's first typhoon measurement using an aircraft; they flew over Typhoon No. 21, directly entering the eye of the typhoon to acquire valuable data. In addition to interdisciplinary research projects, the ISEE has contributed to significant progress in science. For instance, the Microlensing Observations in Astrophysics (MOA) II telescope, operated by the ISEE and the University of Canterbury Mount John Observatory in New Zealand succeeded in observing the visible afterglow of a neutron star merger, first detected by gravitational wave measurements on 17 August 2017. We were very pleased that the ISEE was able to contribute to this historic discovery.

The ISEE strives to nurture young minds through new perspectives and integrated and international partnerships. In particular, the ISEE cooperates with the Graduate School of Science, Graduate School of Engineering, and Graduate School of Environmental Studies of Nagoya University to offer a unique educational opportunity in which graduate students from the three graduate schools collaborate on research of mutual interest. Through the ISEE, these students also participate in international research activities.

At the ISEE, we are actively working on outreach programs to promote public awareness of our research and contribute to science education. In FY 2017, we held an open lecture on the theme of "New Measurement of the Earth" in December and conducted an open laboratory at the University Festival (Meidai-Sai) in June. In August, we also carried out an open seminar "Explosive Phenomena in Space" in conjunction with the Graduate School of Science, a summer school for elementary school students in the Tokai region to learn about the history of the Earth, as well as an open house at the Kiso Observatory. We made a presentation at the Nagoya University Homecoming Day event in October. We also cooperated with organizers in presenting the Science Festival for Young People in the city of Tarumizu, Kagoshima prefecture (the location of the ISEE Observatory) in December. We created a video to explain ISEE research in an easy-to-understand manner for the ISEE homepage and YouTube viewing. Future efforts will include the distribution of postcards providing information about video access to ISEE research, as well as scientific booklets for high school students in Aichi prefecture.

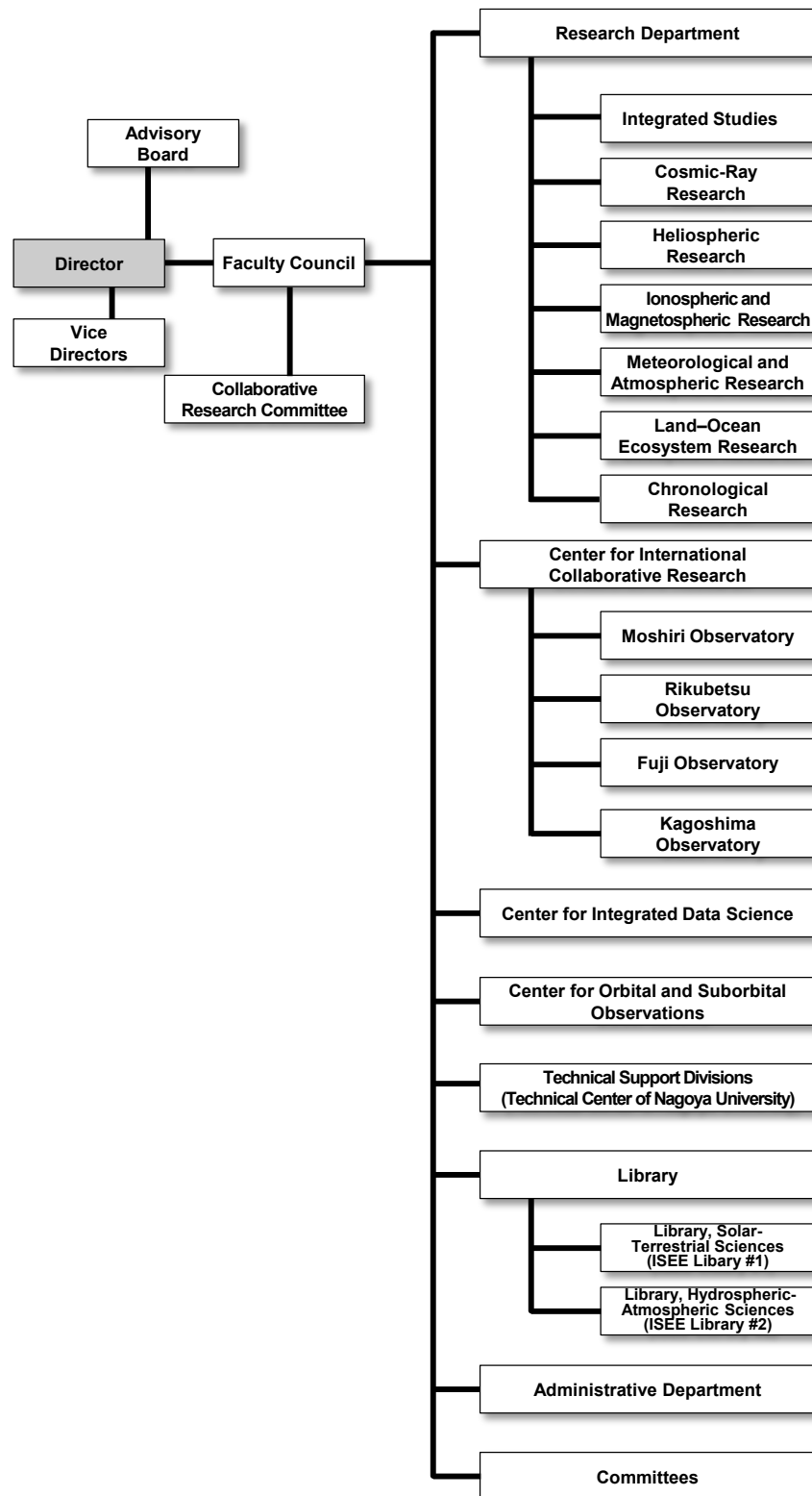
Modern society is undergoing drastic changes and civilization is rapidly evolving in an unprecedented manner at the global scale. The ISEE views the Sun, Earth, and space as a seamless system and it is crucial that people understand the delicate balance and mechanisms of this system and their role in its protection and sustainable development as mankind spreads throughout the solar system. The ISEE will therefore continue with its mission to help resolve global environmental issues and advance space exploration by elucidating the mechanisms and interactions of various phenomena occurring therein. It is our hope that this annual report has highlighted some of the more recent ISEE activities. We look forward to your continued support and cooperation in future research efforts.

Kanya Kusano
Director

2. History

Solar-Terrestrial Environment Laboratory	Hydrospheric Atmospheric Research Center (HyARC)	The Nagoya University Center for Chronological Research
<p>May, 1949 Research Institute of Atmospherics, Nagoya University was established.</p> <p>April, 1958 Cosmic-ray Research Laboratory, Faculty of Science, Nagoya University was established.</p> <p>June, 1990 The Solar-Terrestrial Environment Laboratory (STEL) was established.</p> <p>April, 1995 The Center for Joint Observations and Data Processing was organized.</p> <p>April, 2003 The Rikubetsu Observatory was organized.</p> <p>April, 2004 The Geospace Research Center was established.</p> <p>March, 2006 Laboratory was relocated to the Higashiyama Campus.</p> <p>April, 2010 Approved as one of the Joint Usage/Research Centers.</p>	<p>April, 1957 The Water Research Laboratory, Faculty of Science, Nagoya University was established.</p> <p>September, 1973 The Water Research Institute (WRI), Nagoya University was organized.</p> <p>April, 1993 The Institute for Hydrospheric-Atmospheric Sciences (IHAS), Nagoya University was organized.</p> <p>April, 2001 The Hydrospheric Atmospheric Research Center (HyARC), Nagoya University was established.</p> <p>April, 2010 Approved as one of the Joint Usage/Research Centers.</p>	<p>February, 1981 The Tandetron Accelerator Laboratory was established in the Radioisotope Research Center of Nagoya University.</p> <p>March, 1982 Installation of the Tandetron Accelerator Mass Spectrometry (AMS) machine No.1 was completed.</p> <p>January, 1987 Inter-University Service of ¹⁴C measurements was started with the Tandetron AMS machine No.1.</p> <p>June, 1990 The Nagoya University Dating and Material Research Center was established.</p> <p>March, 1997 The Tandetron AMS machine No.2 was newly introduced.</p> <p>April, 2000 The Nagoya University Center for Chronological Research was organized. The CHIME dating system was transferred from the School of Science.</p>
<p>October, 2015, Institute for Space–Earth Environmental Research (ISEE), merging the laboratory and two centers, was established.</p>		
<p>January, 2016 ISEE was approved as one of the Joint Usage/Research Centers.</p>		

3. Organization



4. Staff

Director	Kanya Kusano
Vice Directors	Joji Ishizaka
Vice Directors	Kazuo Shiokawa

April 1, 2017–March 31, 2018

* : Concurrent post

▲ : Left the Institute in the 2017 academic year

○ : Joined the Institute in the 2017 academic year

Division for Integrated Studies

Professor	Shinobu Machida ▲
Professor	Kanya Kusano (*)
Associate Professor	Satoshi Masuda
Associate Professor	Yoshizumi Miyoshi (*)
Designated Associate Professor	Shinji Saito *1
Lecturer	Takayuki Umeda (*)
Assistant Professor	Akimasa Ieda
Assistant Professor	Shinsuke Imada *2
Researcher	Haruhisa Iijima
Research Institution Researcher	Yasunori Tsugawa ▲
Research Institution Researcher	Takuma Matsumoto ○▲

Visiting Academic Staff/Visiting Faculty Members

Visiting Professor	Kiyoto Shibasaki
--------------------	------------------

*1 Belongs to Graduate School of Science

*2 Lecturer after February 2018

Division for Cosmic-Ray Research

Professor	Yoshitaka Itow
Professor	Hiroyasu Tajima (*)
Associate Professor	Kimiaki Masuda ▲
Associate Professor	Yutaka Matsubara
Associate Professor	Fumio Abe (*)
Associate Professor	Fusa Miyake ○
Designated Associate Professor	Kazutaka Yamaoka *1
Lecturer	Takashi Sako ▲
Assistant Professor	Akira Okumura *2
Designated Assistant Professor	Hiroaki Menjo *1
Researcher	Yoshinori Sasai ○
Technical Assistant	Kinji Morikawa
Technical Assistant	Nobuhito Yamane ○▲

*1 Belongs to Graduate School of Science

*2 Lecturer after March 2018

Division for Heliospheric Research

Professor	Munetoshi Tokumaru
Associate Professor	Kazumasa Iwai ○
Assistant Professor	Ken-ichi Fujiki

Division for Ionospheric and Magnetospheric Research

Professor	Masafumi Hirahara
Professor	Kazuo Shiokawa (*)
Associate Professor	Yuichi Otsuka
Associate Professor	Satonori Nozawa
Associate Professor	Nozomu Nishitani (*)
Lecturer	Shin-ichiro Oyama
Designated Assistant Professor	Atsuki Shinbori ○
Researcher	Mitsuru Matsumura
Research Institution Researcher	Neethal Thomas ○

Visiting Academic Staff/Visiting Faculty Members

Visiting Associate Professor	Yasunobu Ogawa
Visiting Associate Professor	Yoshifumi Saito
Visiting Associate Professor	Ayako Matsuoka
JSPS Postdoctoral Fellowship for Research in Japan	Cai Lei ▲

Division for Meteorological and Atmospheric Research

Professor	Akira Mizuno
Professor	Nobuhiro Takahashi (*)
Professor	Kazuhisa Tsuboki (*)
Professor	Yutaka Matsumi (*)▲
Associate Professor	Tomoo Nagahama
Associate Professor	Hirohiko Masunaga
Associate Professor	Taro Shinoda (*)
Lecturer	Tomoki Nakayama ▲
Assistant Professor	Taku Nakajima
Designated Assistant Professor	Tadayasu Ohigashi ▲
Researcher	Yoshiki Fukutomi ▲
Researcher	Fumie Furuzawa
Technical Assistant	Kazuji Suzuki ▲
Technical Assistant	Seina Ishida ○▲

Division for Land–Ocean Ecosystem Research

Professor	Joji Ishizaka
Professor	Tetsuya Hiyama (✳)
Associate Professor	Hidenori Aiki
Associate Professor	Naoyuki Kurita ○
Lecturer	Hatsuki Fujinami
Assistant Professor	Yoshihisa Mino
Researcher	Shun Ohishi ○
Research Institution Researcher	Zhu Yuanli ○

Division for Chronological Research

Professor	Masaki Enami
Professor	Hiroyuki Kitagawa
Associate Professor	Masayo Minami
Associate Professor	Takenori Kato (✳)
Associate Professor	Kimiaki Masuda (✳)▲
Assistant Professor	Hiroataka Oda
Research Institution Researcher	Naoyuki Kurita ▲
Research Institution Researcher	Fumiko W. Nara ▲
Research Institution Researcher	Masako Yamane ○
Technical Assistant	Masami Nishida
Technical Assistant	Yuriko Hibi
Technical Assistant	Miyo Yoshida ▲

Visiting Academic Staff/Visiting Faculty Members

Toshio Nakamura

Center for International Collaborative Research

Director • Professor	Kazuo Shiokawa
Professor	Tetsuya Hiyama
Professor	Masaki Enami (✳)
Professor	Akira Mizuno (✳)
Designated Professor	Ioannis Daglis ○▲
Designated Professor	Joaquim Ignacio Goes ○▲
Designated Professor	Joseph Benjamin Harold Baker ▲
Designated Professor	Kimberly Dawn Leka ○
Designated Professor	Lee Zhongping ○
Designated Professor	Lynn Marie Kisteler ○
Designated Professor	Martin Gerard Connors ▲

Designated Professor	Maria Fatima Helga Do Rosario Gomes ○▲
Designated Professor	Stephen Michael Playfer ○
Designated Professor	Sergey Anatolievich Tyul'bashev ○▲
Associate Professor	Nozomu Nishitani
Associate Professor	Naoyuki Kurita (✳)○
Associate Professor	Satonori Nozawa (✳)
Designated Associate Professor	Bich Thuy Ly ○▲
Designated Associate Professor	Surendra Kumar Dhaka ○▲
Lecturer	Takashi Sako (✳)▲
Lecturer	Hatsuki Fujinami (✳)
Designated Assistant Professor	Masaki Nishino *1
Designated Assistant Professor	Taro Nakai ○
Researcher	Hironari Kanamori
Researcher	Park Sung-Hong ○

Visiting Academic Staff/Visiting Faculty Members

Visiting Professor	Hiroyuki Shinagawa
Visiting Professor	Yoshinobu Harazono
Visiting Professor	Park Hotaek
Visiting Professor	Tomoomi Kumagai ○

Moshiri Observatory

Technical Assistant	Yuuji Ikegami ▲
Technical Assistant	Masayuki Sera ▲

Foreign Visiting Research Fellow (Visiting Professor)

March 1 – May 31, 2017	Bernhard Kliem
May 1 – June 10, 2017	Sarma Venkata Subrahmanya Srinivasa Vedula

*1 Belongs to Graduate School of Engineering, Designated Lecturer after August 2017

Center for Integrated Data Science

Director • Professor	Kazuhisa Tsuboki ○
Professor	Kanya Kusano
Professor	Joji Ishizaka (✳)
Professor	Shinobu Machida (✳)▲
Associate Professor	Fumio Abe
Associate Professor	Takenori Kato
Associate Professor	Yoshizumi Miyoshi
Associate Professor	Satoshi Masuda (✳)
Associate Professor	Hirohiko Masunaga (✳)
Designated Associate Professor	Tomoaki Hori ○
Lecturer	Takayuki Umeda
Assistant Professor	Akimasa Ieda (✳)
Assistant Professor	Shinsuke Imada (✳)* ¹
Designated Assistant Professor	Sachie Kanada
Designated Assistant Professor	Masafumi Shoji ▲
Designated Assistant Professor	Satoshi Inoue
Designated Assistant Professor	Mariko Teramoto
Designated Assistant Professor	Tzu-Fang Chang ○
Designated Assistant Professor	Takuma Matsumoto ○
Researcher	Norio Umemura
Researcher	Masaya Kato ○
Researcher	Mayumi Yoshioka ▲
Researcher	Yukie Moroda
Researcher	Satoshi Kurita ○
Researcher	Takafumi Kaneko ○
JSPS Research Fellowship	Shoya Matsuda ○
JSPS Research Fellowship	Hidetaka Hirata ○
Technical Assistant	Tomoya Iju ▲* ²
Technical Assistant	Mariko Kayaba
Technical Assistant	Asayo Maeda
Technical Assistant	Takahiro Tsukamoto
JSPS Postdoctoral Fellowship for Research in Japan (Summer Program)	Magnus Morton Woods ○▲
JSPS Bridge Fellow Program	Savani Patel Neel Prakash ○▲

Visiting Academic Staff/Visiting Faculty Members

Visiting Professor	Yoshiya Kasahara
Visiting Professor	Kanako Seki
Visiting Associate Professor	Ryouhei Kano
Visiting Associate Professor	Iku Shinohara
Visiting Associate Professor	Hirohisa Hara
Visiting Associate Professor	Daiko Shiota ○

*1 Lecturer from February 2018

*2 Researcher from November 2017

Center for Orbital and Suborbital Observations

Director • Professor	Nobuhiro Takahashi
Professor	Hiroyasu Tajima
Professor	Yutaka Matsumi ▲
Designated Professor	Masataka Murakami
Professor	Joji Ishizaka (✳)
Professor	Kazuhisa Tsuboki (✳)
Professor	Masafumi Hirahara (✳)
Associate Professor	Taro Shinoda
Designated Assistant Professor	Hiroyuki Tomita
Researcher	Woonseon Jung
Technical Assistant	Hiroshi Sasago ▲
Technical Assistant	Tomoko Tanaka

Visiting Academic Staff/Visiting Faculty Members

Visiting Professor	Masahiro Kawasaki
Visiting Professor	Kunihiko Kodera
Visiting Professor	Yoshikatsu Kuroda
Visiting Associate Professor	Yasutaka Narusawa

Cooperating Research Fellow

Keiji Hayashi
Akiko Mizuno
Claudia Maria Martinez Calderon ▲

Technical Center of Nagoya University

Senior Technician	Akiko Ikeda *1	Section Head, Research Support Office	Tadayosi Ito
Senior Technician	Yasusuke Kojima *1	Leader, General Affairs Section 1	Yumi Matsubara ▲
Senior Technician	Haruya Minda *1	Administrator	Yoko Nokura ○
Technician	Tetsuya Kawabata *2	Administrator	Harumi Morishita
Technician	Tomonori Segawa *2	Administrator	Anna Kato
Technician	Yoshiyuki Hamaguchi *2	Administrator	Yori Sato ▲
Technician	Yasushi Maruyama *2	Administrator	Yuka Suzuki ○
Technician	Takayuki Yamasaki *2	Manager, Accounting Division	Hiroyuki Ichioka ○
Technician	Yuka Yamamoto *2	Specialist, Maintenance Section	Yoshiyuki Nakano
Assistant Technician	Takumi Adachi *3	Section Head, Supplies Section	Noriaki Hiroi
Assistant Technician	Moeto Kyushima *3	Section Head, Supplies Section	Kiyoko Hasegawa
Assistant Technician	Ryuji Fujimori *3	Section Head, Maintenance Section	Shinichi Nakagawa
		Leader, Accounting Section	Youko Yasui ○
		Leader, Supplies Section	Yuka Matsuoka
		Administrator	Mio Kato ▲
		Administrator	Yuka Ito ○
		Administrator	Ayaka Nakamura ▲
		Administrator	Kyohei Yamaguchi ○
		Designated Supervisor	Tadashi Tsuboi ○

*1 Changed from Senior Technical Specialist after October 2017

*2 Changed from Technical Specialist after October 2017

*3 Changed from Technical Staff after October 2017

Foreign Visiting Cooperation Researcher

September 1, 2016 – August 31, 2017	Anglu Shen		
October 1, 2016 – January 31, 2018	Jie Ren		
May 12 – August 10, 2017	Ngoc Hanh Tam Dao		
June 1 – August 31, 2017	Daniel Izuikedinachi Okoh		
July 20 – October 20, 2017	Devanaboyina Venkata Ratnam		
July 30 – September 30, 2017	Sergii Panasenko		
November 13 – December 30, 2017	Das Uma		

Administration Department

Director, Administration Department	Sumio Murai
Manager, General Affairs Division	Kazuhiko Tsukazaki ○
Office Manager, Research Support Office	Tohru Kawai ▲
Specialist, General Affairs Section	Norishi Sugiyama
Section Head, General Affairs Section 1	Seiji Tsuruta ○
Section Head, General Affairs Section 2	Sayuri Morino ▲
Section Head, Personnel Affairs Section	Shoji Asano

Toyokawa Branch

Technical Assistant	Kayoko Asano
Technical Assistant	Yasuo Kato

5. Committee of Other Organizations

Committee of Other Organizations

Contact Post	Job Title	Organizations	Name of Committee / Title
Kanya Kusano	Professor	International Astronomical Union (IAU)	Organizing Committee Member of Commission E3 Solar Impact throughout the Heliosphere
Kanya Kusano	Professor	Solar Physics	Editorial Board member
Yoshizumi Miyoshi	Associate Professor	Committee on Space Research (COSPAR)	Vice-chair of the Panel on Radiation Belt Environment Modeling (PRBEM)
Yoshizumi Miyoshi	Associate Professor	Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)	Campaign coordinator of VarSITI/SPeCIMEN
Yoshizumi Miyoshi	Associate Professor	Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)	Co-leader of the SCOSTEP VarSITI (Variability of the Sun and Its Terrestrial Impact)/SPeCIMEN (Specification and Prediction of the Coupled Inner-Magnetospheric Environment)
Yoshizumi Miyoshi	Associate Professor	Annales Geophysicae	Editor
Yoshizumi Miyoshi	Associate Professor	Earth and Planetary Physics	Editor
Yoshitaka Itow	Professor	Telescope Array collaboration	Telescope Array External Advisory committee
Hiroyasu Tajima	Professor	B-factory Programme Advisory Committee	Committee member
Hiroyasu Tajima	Professor	Progress of Theoretical and Experimental Physics	Editor
Hiroyasu Tajima	Professor	The Scientific World Journal	Editorial Board member
Kazuo Shiokawa	Professor	Earth, Planets and Space (EPS)	Guest Editor for the special issue of Global Data Systems for the Study of Solar-Terrestrial Variability
Kazuo Shiokawa	Professor	Committee on Space Research (COSPAR)	Chair of the COSPAR Sub-Commission C1 (The Earth's Upper Atmosphere and Ionosphere)
Kazuo Shiokawa	Professor	Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)	Co-chair of the SCOSTEP VarSITI (Variability of the Sun and Its Terrestrial Impact)
Kazuo Shiokawa	Professor	Journal of Atmosphere and Solar-Terrestrial Physics	Guest editor for the special issue of the 1st VarSITI General Symposium (VarSITI2016)
Nozomu Nishitani	Associate Professor	Super Dual Auroral Radar Network	Executive Council
Nozomu Nishitani	Associate Professor	Earth, Planets and Space (EPS)	Guest Editor for the special issue of Global Data Systems for the Study of Solar-Terrestrial Variability
Nozomu Nishitani	Associate Professor	Earth, Planets and Space (EPS)	Guest Editor for the special issue of Recent Advances in MST and EISCAT/Ionospheric Studies - Special Issue of the Joint MST15 and EISCAT18 Meetings, May 2017
Nozomu Nishitani	Associate Professor	Earth, Planets and Space (EPS)	Vice Editors-in-Chief

Contact Post	Job Title	Organizations	Name of Committee / Title
Yuichi Otsuka	Associate Professor	Journal of Astronomy and Space Sciences	Editor
Satonori Nozawa	Associate Professor	EISCAT Scientific Association	Council member
Satonori Nozawa	Associate Professor	Earth, Planets and Space (EPS)	Guest editor for the special issue of Recent Advances in MST and EISCAT/Ionospheric Studies - Special Issue of the Joint MST15 and EISCAT18 Meetings, May 2017
Shin-ichiro Oyama	Lecturer	Committee on Space Research (COSPAR)	Science Organizing Committee
Masataka Murakami	Designated Professor	World Meteorological Organization (WMO)	Member of Weather Modification Expert Team
Masataka Murakami	Designated Professor	AMS	Chair, Ccommittee on Planned and Inadvertent Weather Modification
Hirohiko Masunaga	Associate Professor	World Climate Research Programme (WCRP) Global Energy and Water cycle Exchanges (GEWEX)	GEWEX Data and Assessments Panel (GDAP) member
Joji Ishizaka	Professor	North Pacific Marine Science Organization (PICES)	Co-Chair of Advisory Panel for a CREAMS/PICES Program in East Asian Marginal Seas
Joji Ishizaka	Professor	North Pacific Marine Science Organization (PICES)	Member of Working Group 35: Third North Pacific Ecosystem Report
Joji Ishizaka	Professor	Northwest Pacific Action Plan (NOWPAP)	Focal Point of Center for Special Monitoring and Coastal Environmental Assessment Regional Active Center (CEARAC)
Joji Ishizaka	Professor	Journal of Oceanography	Editor-in-Chief
Tetsuya Hiyama	Professor	Integrated Land Ecosystem - Atmosphere Processes Study (iLEAPS), one of the Global Research Projects (GRPs) of the Future Earth	Scientific Steering Committee (SSC) member
Hidenori Aiki	Associate Professor	American Meteorological Society (AMS)	Associate Editor of Journal of Atmospheric and Oceanic Technology (JAOT)
Toshio Nakamura	Visiting Academic Staff/Visiting Faculty Members	Radiocarbon	Member of Editorial Board

6. Joint Research Programs

One of the major functions of the ISEE is to promote and conduct collaborative research on Space–Earth Environmental Science together with researchers from universities and institutes outside the ISEE. On January 14, 2016, the ISEE was certified as a core research institution of Space–Earth Environmental Science, which is a “Joint Usage/Research Center” as defined by MEXT of Japan. We prepared application forms for joint research programs focusing on the following two research issues. One is the “Study of coupling processes in the solar–terrestrial system using ground-based observation network,” and the other is the “Establishment of an international collaborative research hub to solve research issues in the global (terrestrial) environment and space applications based on comprehensive studies of the space–Sun–Earth system.” The former focuses on coupling processes in the solar–terrestrial system and the interactions of neutral and plasma components in the Earth’s atmosphere by establishing an international ground-based observation network ranging from low to high latitude regions, especially in Asia and Africa. The latter aims to establish an international collaborative research hub for comprehensive studies of the space–Sun–Earth system, space applications, space weather forecasting, and environmental problems, such as global warming. The following ten research programs were prepared for the application during the 2017 Japanese fiscal year.

- 01) Joint Research Program (International)
- 02) ISEE International Joint Research Program (*)
- 03) ISEE/CICR International Workshop
- 04) Joint Research Program (General)
- 05) Joint Research Program (Student Encouragement)
- 06) Joint Research Program (Symposium)
- 07) Joint Research Program (Computing Infrastructure)
- 08) Joint Research Program (Database Management)
- 09) Joint Research Program (Accelerator Mass Spectrometry Analysis)
- 10) Carbon 14 Analysis Service

(*) Applicable only to foreign researchers

These collaborative research programs will be executed using the instruments, software/databases, and facilities of the ISEE. Joint research programs from 01) to 03), described above, will be managed by the Center for International Collaborative Research (CICR). Those of 07) and 08) will be managed by the Center for Integrated Data Science (CIDAS), and 09)–10) will be managed by the Division for Chronological Research.

Lists of Accepted Proposals

■ ISEE International Joint Research Program

Proposer	Affiliation*	Job title*	Corresponding ISEE researcher	Title of the research program
Okoh, D.	Centre for Atmospheric Research, National Space Research and Development Agency, Nigeria	Principal Scientific Officer	Shiokawa, K.	Investigating plasma bubble propagations using the all-sky airglow images and GNSS Data
Lee, J.	Seoul National University	BK21 Associate Professor	Masuda, S.	Comparative Study of NoRH microwave maps and SDO/AIA EUV DEM maps
Chonokhuu, S.	National University of Mongolia	Associate Professor	Matsumi, Y.	Development of PM2.5 instruments and observation in Mongolia and Japan
Teh, W.-L.	Space Science Centre, Institute of Climate Change	Lecturer	Umeda, T.	Study on the formation of small-scale magnetic flux ropes in the reconnection diffusion region
Panasenko, S. V.	Institute of ionosphere of NAS and MES of Ukraine	Head of Department	Otsuka, Y.	Joint observations of travelling ionospheric disturbances using radar and GPS techniques
Huang, J.	National Astronomical Observatories, Chinese Academy of Sciences	Associated Professor	Masuda, S.	Joint study of particle acceleration in solar flares with MUSER and NoRH
Mann, I.	UiT the Arctic University of Norway	Professor	Nozawa, S.	Combining PMSE and wind observations to study coupling processes in the mesosphere
Padmanabhan, J.	Physical Research Laboratory, Ahmedabad	Senior Professor and Dean	Fujiki, K.	The Role of flow angle in determining geo-effectiveness of non-radial solar wind outflows associated with Corotating Interaction Region (CIR) like events
Vouridas, A.	The Johns Hopkins University Applied Physics Laboratory	Section Supervisor	Kusano, K.	Investigating heliospheric data assimilation to improve the CME arrival predictions of MHD codes
Kupriyanova, E.	Central Astronomical Observatory (CAO) at Pulkovo of the RAS	Senior Researcher	Masuda, S.	Diagnostics of mechanism of quasi-periodic pulsations in the multi-wavelength emission of solar flares
Savcheva, A.	Harvard-Smithsonian Center for Astrophysics	Astrophysicist	Kusano, K.	Data-driven and MHD simulations of space-weather-effective quiet-sun filament eruptions
Vichare, G.	Indian Institute of Geomagnetism	Associate Professor	Shiokawa, K.	Study of the propagation of substorm associated Pi2 pulsations in different local time sectors
Venkata Ratnam, D.	KL University	Professor	Otsuka, Y.	Development of Ionospheric Weather Forecasting Algorithms for GNSS Users
Dao, N. H. T.	Ho Chi Minh Institute of Physics	Researcher	Otsuka, Y.	Study of the causes of post-midnight field-aligned irregularity at magnetically low latitudes using simulations
Manoharan, P. K.	National Centre for Radio Astrophysics (NCRA), Tata Institute of Fundamental Research	Professor and Head of Radio Astronomy Centre	Tokumar, M.	Inter-calibration of IPS data sets from ISEE and Ooty Observatories

* Proposer's affiliation and job title are as of the proposal submission date.

■ ISEE/CICR International Workshop

Proposer	Affiliation*	Job title*	Corresponding ISEE researcher	Title of the research program
Leka, K. D.	NorthWest Research Associates	Associates Senior Research Scientist	Kusano, K.	Operational Flare Forecasts: a systematic community comparison
Imada, S.	Nagoya University	Assistant Professor	Imada, S.	Solar Cycle 25 Prediction Workshop

* Proposer's affiliation and job title are as of the proposal submission date.

List of Collaboration Resources

■ Instruments

Name	Contact Person
UV/Visible Spectrometer for Atmospheric Composition Measurements (Rikubetsu)	T. Nagahama
Carbon Dioxide (CO ₂) Isotope Measurement Instrument (¹³ C, ¹⁸ O) Using a Laser Spectroscopic Technique in the Mid-Infrared Region (Nagoya)	Y. Matsumi
Optical Mesosphere Thermosphere Imagers	K. Shiokawa
Magnetometer Network	K. Shiokawa
ELF/VLF Network	K. Shiokawa
Sodium LIDAR (Tromsø)	S. Nozawa
MF Radar (Tromsø)	S. Nozawa
Meteor Radar (Alta)	S. Nozawa
Solar Neutron Telescope (Norikura Observatory, Institute for Cosmic Ray Research, the University of Tokyo)	Y. Matsubara
Low-Background Beta-Ray Counter	K. Masuda
Multi-Station IPS Solar Wind Observation System (Toyokawa, Fuji, and Kiso)	M. Tokumaru
Nobeyama Radioheliograph	S. Masuda
Multi-Directional Cosmic Ray Muon Telescope (Nagoya)	F. Abe
SuperDARN Hokkaido Radar (Rikubetsu)	N. Nishitani
Upper Air Sounding Systems (two sets)	K. Tsuboki
Polarimetric Radar Systems (two sets)	K. Tsuboki
Ka-band Polarimetric Radar	K. Tsuboki
Hydrometeor Video Sonde (HYVIS) System	K. Tsuboki

■ Software/Databases

Name	Contact Person
Atmospheric Composition Data by FT-IR Measurements (Moshiri and Rikubetsu)	T. Nagahama
NO ₂ and O ₃ Data by UV/Visible Spectrometer Measurements (Moshiri and Rikubetsu)	T. Nagahama
Coordinated Magnetic Data Along 210° Magnetic Meridian (Moshiri, Rikubetsu, Kagoshima, and Overseas MM Stations)	K. Shiokawa
All-Sky Auroral Data (Canada, Alaska, and Siberia)	K. Shiokawa, Y. Miyoshi

Name	Contact Person
Database of the Optical Mesosphere Thermosphere Imagers	K. Shiokawa
VHF Radar/GPS Scintillation (Indonesia)	Y. Otsuka
EISCAT Database	S. Nozawa, S. Oyama
ELF/VLF Wave Data	K. Shiokawa
Interplanetary Scintillation Data	M. Tokumaru
Solar Wind Speed Data	M. Tokumaru
Cosmic Ray Intensity Database	F. Abe
MHD Simulation on the Magnetospheric Environment	T. Umeda
S-RAMP Database	F. Abe
CAWSES Database	F. Abe
Hinode Science Center, Nagoya University	K. Kusano
ERG Science Center	Y. Miyoshi
QL Plot Archive of Satellite Data for Integrated Studies	Y. Miyoshi
Remei Satellite Observation Database	M. Hirahara
MOA Database	F. Abe
SuperDARN Hokkaido Radar Database	N. Nishitani
Numerical Simulation Codes for Plasma Kinetics	T. Umeda
Cloud Resolving Strom Simulator (CReSS)	K. Tsuboki
Satellite Data Simulator Unit (SDSU)	H. Masunaga

■ Facilities

Name	Contact Person
Computer System for Solar-Terrestrial Environmental Research (Supercomputer System)	F. Abe, T. Umeda
CHN Analyzer, Isotope Ratio Mass Spectrometer	Y. Mino
Tandatron Accelerator Mass Spectrometry	H. Kitagawa, M. Minami
Electron Probe Microanalyzer (EPMA)	T. Kato
Ion/Electron Beamline and Calibration Facility	M. Hirahara
Clean Room Facility for Instrument Development	M. Hirahara
Facilities at Moshiri Observatory	Y. Matsumi
Facilities at Rikubetsu Observatory	A. Mizuno
Facilities at Kiso Station	M. Tokumaru
Facilities at Fuji Observatory	M. Tokumaru
Facilities at Kagoshima Observatory	K. Shiokawa

7. Governance

As of Mar 31, 2018

Advisory Board

Mamoru Ishii	Space Environment Laboratory, Applied Electromagnetic Research Institute, National Institute of Information and Communications Technology
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Masafumi Hirahara	Institute for Space–Earth Environmental Research, Nagoya University

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8. Finance

External Funding and Industry–Academia–Government Collaborations

Researches of ISEE members as principle investigator were supported by the following external funds.

Kakenhi category	Number of subjects	Total amount (JPY)
Grant-in-Aid for Scientific Research on Innovative Areas	3	85,410,000
Grant-in-Aid for Scientific Research (S)	2	88,790,000
Grant-in-Aid for Scientific Research (A)	6	54,677,143
Grant-in-Aid for Scientific Research (B)	10	45,890,000
Grant-in-Aid for Scientific Research (C)	10	15,860,000
Grant-in-Aid for Challenging Exploratory Research	7	8,288,000
Grant-in-Aid for JSPS Research Fellow	1	2,470,000
Grant-in-Aid for Young Scientists (A)	2	24,570,000
Grant-in-Aid for Young Scientists (B)	4	6,411,453
Fund for the Promotion of Joint International Research	2	14,300,000
Grant-in-Aid for Specially Promoted Research	1	99,710,000
Grant-in-Aid for JSPS Research Fellow	2	2,860,000
Total	50	449,236,596

- fifty research subjects listed in the table were supported by the JSPS Kakenhi.
- Thirty-two research subjects received total 203,709,742 JPY from governmental funds except KAKENHI, and from other universities and companies. Fifteen of them were collaborative researches between ISEE and companies, or national institutes.
- Six research subjects received total 4,340,000 JPY of donation.

Library

■ Library, Solar-Terrestrial Sciences (ISEE Library #1)

Book

Japanese	3,037
Foreign	11,148

Journals

Japanese	4
Foreign	132

■ Library, Hydrospheric-Atmospheric Sciences (ISEE Library #2)

Book

Japanese	4,620
Foreign	8,869

Journals

Japanese	171
Foreign	191

Properties

	Site (m ²)	Bulidings (m ²)	Location
Higashiyama Campus (Main campus of Nagoya University)	-	9,005	Nagoya
Toyokawa Campus	158,002	7,189	Toyokawa
Moshiri Observatory	110,534	325	Hokkaido
Rikubetsu Observatory	24,580	167	Hokkaido
Kagoshima Observatory	13,449	287	Kagoshima
Fuji Observatory	19,926	174	Yamanashi
Sugadaira Station	3,300	0	Nagano
Kiso Station	6,240	66	Nagano
Total	336,031	17,213	