Program

SuperDARN Workshop 2019

2-7 June at Fuji, Japan

This workshop is supported by National Institute of Communications Technology, National Institute of Polar Research, Institute for Space-Earth Environmental Research, and Inoue Foundation for science.

SuperDARN Workshop 2019 Fuji, Japan
NIPR SuperDARN Science meeting 2019
Japanese SuperDARN meeting: present and future
Workshop Time table

Date	Start	End	Slot	Presenter *Authors*	Title
2019/06/02 (Sun.)					
	17:00	19:00	2:00		Reception and Ice breaker
2019/06/03 (Mon.)					
Opening Session	8:30	8:50	0:20	LOC	Opening Session
Introduction Session	8:50	9:10	0:20	Mark Lester	SuperDARN Status Report
Chair: Tsutomu Nagatsuma	9:10	9:20	0:10	Pasha Ponomarenko *Pasha Ponomarenko [1], Daniel Billet [2], Emma Bland [3], Angeline Burrell [4], Keith Kotyk [1], Marina Schmidt [1], Simon Shepherd [5], Kevin Sterne [6], Evan Thomas [5], Maria-Theresia Walach [2],* *1. University of Saskatchewan, Saskatoon, Canada* *2. Lancaster University* *3. The University Centre in Svalbard* *4. U.S. Naval Research Laboratory, Washington D.C., USA* *5. Dartmouth College* *6. Virginia Tech*	Data Analysis Working Group Report
	9:20	9:30	0:10	Kevin Krieger *Kevin Krieger [1], Kevin Sterne [2], Paul Breen [3]* *1. University of Saskatchewan* *2. Virginia Tech* *3. British Antarctic Survey*	Data Distribution Working Group Report
	9:30	9:40	0:10	Evan Thomas *Evan Thomas [1]* *1. Dartmouth College*	Scheduling Working Group Report
	9:40	9:50	0:10	Kevin Sterne *Kevin Sterne [1], Tomo Hori [2], Rob Fear [3], Keisuke Hosokawa [4], Mike Ruohoniemi [1], Jim Wild [5]* *1. Virginia Tech* *2. Nagoya University* *3. University of Southampton* *4. University of Electro-Communications* *5. Lancaster University*	Spacecraft Working Group Report
Latest Project Session **Chair: Mamoru Ishii, Maria Federica Marcucci**	9:50	10:10	0:20	R. Todd Parris *R. Todd Parris [1], Todd Pedersen [1], Eugene Dao [1], Ralph Kelly [2], Sushil Kumar [3], Julie Moses [4]* *1. Air Force Research Laboratory* *2. Space Dynamics Laboratory* *3. Universitt of the South Pacific* *4. Air Force Office of Scientific Research*	Equatorial ionospheric HF radar: Simulation, design, and plans
	10:10	10:30	0:20		Coffee Break
	10:30	10:50	0:20	Jingye Yan *Jingye Yan [1]* *1. National Space Science Center (NSSC), Chinese Academy of Sciences*	Mid-latitude HF radar in China

	10:50	11:10	0:20	Maria Federica Marcucci	The Dome C North radar: first light

Maria Federica Marcucci [1], David Biondi [1], Alessandro Cirioni [2], Igino Coco [3], Angelo De Simone [4], Simona Longo [2], Angelo Olivieri [4], S. Massetti [1], Enrico Simeoli [4], Andrea Satta [5]
1. INAF-Istituto di Astrofisica e Planetologia Spaziali, Rome, Italy
2. CNR-Dipartimento Terra Ambiente, Rome, Italy
3. Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy
4. CNR-Dipartimento Reti e Sistemi Informativi, Rome, Italy
5. CNR-Istituto per lo studio degli impatti Antropici e Sostenibilità in ambiente marino, Rome, Italy

	11:10	11:30	0:20	J. Klenzing	petitSat - A 6U CubeSat to examine the link between MSTIDS and ionospheric plasma density enhancements

J. Klenzing [1], R.L. Davidson [2], G.D. Earle [3], A.J. Halford [4], S.L. Jones [1], C. Martinis [5], N. Paschalidis [1], R.F. Pfaff [1], J.M. Smith [1],
1. NASA / GSFC, Greenbelt, MD, USA
2. Utah State University, Logan, UT, USA
3. Virginia Tech, Blacksberg, VA, USA
4. The Aerospace Corporation, Chantilly, VA, USA
5. Boston University, Boston, MA, USA

	11:30	11:50	0:20	Mamoru Ishii	NICT Research and Operation for Space Weather

Mamoru Ishii [1]
1. National Institute of Information and Communications Technology

	11:50	12:10	0:20		Photo Session
	12:10	13:30	1:20		Lunch Break
Polar Cap Phenomena **Chair: A. V. Koustov, Nozomu Nishitani**	13:30	13:50	0:20	A. V. Koustov	Variations in occurrence of polar cap SuperDARN echoes and their causes

A. V. Koustov [1], S. Ullirich [1], P. V. Ponomarenko [1], N. Nishitani [2], M. F. Marcucci [3], W. A. Bristow [4]
1. University of Saskatchewan, Saskatoon, Canada
2. Nagoya University, Nagoya, Japan
3. Institute for Space Astrophysics and Planetology, Rome, Italy
4. University of Alaska Fairbanks, Fairbanks, USA

	13:50	14:10	0:20	Qing-He Zhang	Formation and Evolution of Polar Cap Ionospheric Patches and Their Associated Upflows and Scintillations: A Review

Qing-He Zhang [1], Zan-Yang Xing [1], Yong Wang [1], Yu-Zhang Ma [1]
1. Institute of Space Sciences, Shandong University, Weihai, China

	14:10	14:30	0:20	Motoharu Nowada	Ionospheric Flow Patterns Associated with Nightside Distorted Transpolar Arc: A Possible Formation Process Deduced from SuperDARN Measurements

Motoharu Nowada [1], Jun Yang [1], Adrian Grocott [2], Robert C. Fear [3]
1. Shandong Provincial Key Laboratory of Optical Astronomy and Solar-Terrestrial Environment, Institute of Space Sciences, Shandong University, Weihai, People's Republic of China.
2. Space and Planetary Physics Group, Department of Physics, Lancaster University, Lancaster, UK.
3. Department of Physics and Astronomy, University of Southampton, Southampton, UK.

	14:30	14:50	0:20	Qing-He Zhang	A long-lasting auroral bright spot around magnetic north pole: Is it the evidence of stable magnetic reconnection?

Qing-He Zhang [1], Guo-Cheng Shen [1], Yong-Liang Zhang [2], Kjellmar Oksavik [3], Michael Lockwood [4], Zan-Yang Xing [1], Yu-Zhang Ma [1]
1. Institute of Space Sciences, Shandong University, Weihai, China
2. The Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland, USA
3. Birkeland Centre for Space Science, University of Bergen, Bergen, Norway
4. Department of Meteorology, University of Reading

	14:50	15:10	0:20	Andrew Kiene	The search for ion-neutral coupling and Joule heating in the polar cap

A. Kiene [1], W. A. Bristow [1], M. G. Conde [1], D. L. Hampton [1]
1. University of Alaska Fairbanks

	15:10	15:30	0:20		Coffee Break

Multi-Scale Electromagnetic Coupling
Chair: Paul Prikryl, Masakazu Watanabe

15:30 16:00 0:30 Akimasa Yoshikawa * Invited Talk — MAGDAS project: Research for global and local electromagnetic coupling from polar to equatorial ionosphere

Akimasa Yoshikawa [1]
1. International Center for Space Weather Science and Education, Kyushu University, Japan

16:00 16:20 0:20 Paul Prikryl — Solar wind imprint on gravity waves and intensification of tropical cyclones

Paul Prikryl [1,2]
1. Physics Department, University of New Brunswick, Fredericton, NB, Canada
2. Geomagnetic Laboratory, Natural Resources Canada, Ottawa, ON, Canada

16:20 16:40 0:20 Shin-ichiro Oyama — Spatial distribution of the polar thermospheric wind acceleration and importance of the 2D measurement

Shin-ichiro Oyama [1,2,3], Anita Aikio [2], Mark G. Conde [4], Heikki Vanhamäki [2], Ilkka Virtanen [2], Thomas Ulich [2], Lassi Roininen [5], Pekka Verronen [6], Takeshi Sakanoi [7]
1. ISEE Nagoya U
2. U. Oulu
3. National Institute of Polar Research
4. GI UAF
5. Lappeenranta-Lahti University of Technology
6. Finnish Meteorological Institute
7. Tohoku U.

16:40 17:10 0:30 Yoshimasa. Tanaka * Invited Talk — Simultaneous observation of magnetospheric plasma waves and PMWE observed by Arase satellite and MST radars

Yoshimasa Tanaka [1,2,3], Takanori Nishiyama [1,3], Akira Kadokura [1,2,3], Mitsunori Ozaki [4], Mitsunori Ozaki [4], YoshizumiMiyoshi [5], Kazuo Shiokawa [5], Shin-Ichiro Oyama [1,5,6], Ryuho Kataoka [1,3], Masaki Tsutsumi [1,3], Koji Nishimura [1,2,3], Kaoru Sato [7], Yoshiya Kasahara [4], Atsuki Kumamoto [8], Fuminori Tsuchiya [8], Mizuki Fukizawa [8], Mitsuru Hikishima [9], Shoya Matsuda [9], Ayako Matsuoka [9], Iku Shinohara [9], Masahito Nosé [5], Tsutomu Nagatsuma [10], Manabu Shinohara [11], Akiko Fujimoto [12], Mariko Teramoto [5], Reiko Nomura [13], Akira Sessai Yukimatu [1,3], Keisuke Hosokawa [14], Masafumi Shoji5, Ralph Latteck [15]
1. National Institute of Polar Research, Japan
2. Polar Environment Data Science Center, Joint Support-Center for Data Science Research, Research Organization of Information and Systems, Japan
3. The Graduate University for Advanced Studies, Japan
4. Graduate School of Natural Science and Technology, Kanazawa University, Japan
5. Institute for Space-Earth Environmental Research, Nagoya University, Japan
6. University of Oulu, Finland
7. The University of Tokyo, Japan
8. Graduate School of Science, Tohoku University, Japan
9. Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan
10. National Institute of Information and Communications Technology, Japan
11. Kagoshima National College of Technology, Japan
12. Kyushu Institute of Technology, Japan
13. National Astronomical Observatory of Japan
14. The University of Electro-Communications, Japan
15. eibniz-Institute of Atmospheric Physics, Kühlungsborn, Germany

18:00 20:00 2:00 — Data Distribution WG meeting at "Fuyou" Located at B1 floor

20:00 22:00 2:00 — Spacecraft WG & Schedule WG meeting (Joint) at "Fuyou" Located at B1 floor

20:00 25:00* 5:00* — PI meeting at "Sakura"* Located at 2nd floor

* The "Sakura" room can be used until 1 am, 4th June.

2019/06/04 (Tue.)

Review and Tutorial Talk
Chair: Tsutomu Nagatsuma

8:30 9:00 0:30 Nozomu Nishitani — Mid-latitude SuperDARN Review Paper

N. Nishitani [1], J.M. Ruohoniemi [2], M. Lester [3], J.B.H. Baker [2], A.V. Koustov [4], S.G. Shepherd [5], G. Chisham [6], T. Hori [1], E.G. Thomas [5], R.A. Makarevich [7], A. Marchaudon [8], P. Ponomarenko [4], J.A. Wild [9], S.E. Milan [3], W.A. Bristow [7], J. Devlin [8], E. Miller [10], R.A. Greenwald [2], T. Ogawa [11], T. Kikuchi [1]
1. ISEE, Nagoya Univ.
2. Virginia Tech
3. Univ. of Leicester
4. Univ. of Saskatchewan
5. Thayer School of Engineering, Dartmouth College
6. BAS
7. Univ. of Alaska Fairbanks
8. IRAP, University of Toulouse,CNRS,CNES
9. Univ. of Lancaster
10. APL
11. NICT

9:00 9:40 0:40 J. Michael Ruohoniemi * Tutorial Talk — Review of Magnetosphere-Ionosphere Coupling and Recent Results from Coordinated Observations

J. Michael Ruohoniemi [1]
1. Virginia Tech

Data Processing and Analysis
Chair: Pasha Ponomarenko, Mike Kosch

9:40 10:00 0:20 Evan Thomas — Empirical ground scatter classification and geolocation

Evan Thomas [1], Simon Shepherd [1]
1. Dartmouth College

10:00 10:20 0:20 Coffee Break

10:20 10:40 0:20 Pasha Ponomarenko — Validation of the SuperDARN range-finding algorithms in

Pasha Ponomarenko [1], Kathryn McWilliams [1], Jean-Pierre St.-Maurice [1]
1. University of Saskatchewan, Saskatoon, Canada

10:40 11:00 0:20 Pasha Ponomarenko — Advantages and limitations of IQ-based SuperDARN interferometry

Pasha Ponomarenko [1], Kathryn McWilliams [1], Jean-Pierre St.-Maurice [1]
1. University of Saskatchewan, Saskatoon, Canada

11:00 11:20 0:20 Ailan Lan — AgileDARN radar calibration: internal and external calibrations

Ailan Lan [1]
1. National Space Science Center (NSSC), Chinese Academy of Sciences

11:20 11:40 0:20 Angeline G. Burrell — Comparison of different interferometer calibration methods

Angeline G. Burrell [1], Aurélie Marchaudon [2], Gareth Chisham [3], Pasha Ponomarenko [4], Simon Shepherd [5]
1. U.S. Naval Research Laboratory, Washington D.C., USA
2. Institut de Recherche en Astrophysique et Planétologie (IRAP)/ Centre National de la Recherche Scientifique (CNRS), Toulouse, France
3. British Antarctic Survey, Cambridge, UK
4. University of Saskatchewan, Saskatoon, Canada
5. Dartmouth College, Hanover, NH, USA

11:40 12:00 0:20 M. J. Kosch — A novel technique to estimate the altitude of SuperDARN HF radar backscatter

M.J. Kosch [1], E. Bland [2], T. Matamba [1], T. Yeoman [3], M.T. Rietveld [4], N. Nishitani [5]
1. South African National Space Agency
2. The University Centre in Svalbard
3. University of Leicester
4. EISCAT Scientific Association
5. Nagoya University

12:00 13:30 1:30 Lunch Break

13:30 13:50 0:20 Marina Schmidt — PyDARN: Python Data Visualization Library

Marina Schmidt [1], Ashton Reimer [2], Kathryn McWilliams [1]
1. University of Saskatchewan
2. SRI Interanational

	13:50	14:10	0:20	Marina Schmidt	Software Practices: are they Practical for Scientists?

Marina Schmidt [1]
1. University of Saskatchewan

	14:10	14:30	0:20	R. A. Stoneback	pysat : A Bridge Between Worlds

R. A. Stoneback [1], A. G. Burrell [2], J. Klenzing [3]
1. The University of Texas at Dallas
2. Naval Research Laboratory
3. NASA

MTI **Chair: Tim Yeoman, Keisuke Hosokawa**	14:30	15:00	0:30	Kazuo Shiokawa * Invited Talk	Ground-based multi-point network observation of the inner magnetosphere at subauroral latitudes by the PWING project

Kazuo Shiokawa [1], The PWING team [2]
1. Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Japan
2. Members of the ERG-Ground Coordinated Observation Team (PWING Project)

	15:00	15:20	0:20	Subir Mandal	Information on gravity wave propagation characteristics over long duration in the upper atmosphere as obtained using digisonde measurements

Subir Mandal [1], Duggirala Pallamraju [1], Deepak K. Karan [1], Pradip Suryawanshi [1]
1. Physical Research Laboratory, Navrangpura, Ahmedabad, India

	15:20	15:40	0:20	Patrick Espy	Measuring Planetary Waves and Tides in the MLT at 60°N Using a Longitudinal Array of SuperDARN Radars

Wim van Caspel [1], Patrick Espy [1], Robbert Hibbins [1]
1. Norwegian University of Science and Technology and BCSS

	15:40	16:00	0:20		Coffee Break
	16:00	16:20	0:20	D. D. Billett	Multi-instrument Observations of Dayside Ion-Neutral Coupling in the Auroral Zone

D. D. Billett [1], K. Hosokawa [2], A. Grocott [1], J. A. Wild [1], A. L. Aruliah [3], Y. Ogawa [4], S. Taguchi [5]
1. Lancaster University
2. University of Electro-Communications
3. University College London
4. National Institute of Polar Research
5. Kyoto University

	16:20	16:40	0:20	T. K. Yeoman	SuperDARN elevation angle measurements of artificially-induced HF radar backscatter during a period of simultaneous topside and bottomside ion line enhancements induced in ionospheric modification experiments.

T. K. Yeoman [1], T. Rexer [2], B. Gustavsson [2], T. Leyser [3], M. Rietveld [4], T. Grydeland [5]
1. Department of Physics and Astronomy, University of Leicester, UK.
2. Institute for Physics and Technology, Arctic University of Norway
3. Swedish Institute of Space Physics, Uppsala, Sweden
4. EISCAT Research Association, Ramfjordmoen , Norway
5. Northern research institute, Tromso, Norway

Inner Magnetosphere **Chair: Jo Baker, Hideaki Kawano**	16:40	17:00	0:20	Joseph B. H. Baker	An examination of inner-magnetosphere shielding by Region-2 Field-Aligned Currents

Bharat Kunduri [1], Joseph B. H. Baker [1], J. Michael Ruohoniemi [1]
1. Space@VT

	17:00	17:20	0:20	T. Hori	Special-time observations for SuperDARN-Arase satellite conjunction

T. Hori [1], N. Nishitani [1], A. S. Yukimatu [2], T. Nagatsuma [3], K. Hosokawa [4], H. Kawano [5], M. Watanabe [5], Y. Miyoshi [1], I. Shinohara [6]
1. ISEE, Nagoya Univ.
2. NIPR, SOKENDAI
3. NICT
4. UEC
5. Kyushu Univ.
6. JAXA/ISAS

	19:30	21:30	2:00		Data Analysis WG meeting at "Fuyou" Located at B1 floor

2019/06/05 (Wed.)

	8:30	9:00	0:30	Y. Miyoshi * Invited Talk	Geospace Explorations by the ERG/Arase project

Y. Miyoshi [1], I. Shinohara [2], T. Takashima [2], K. Asamura [2], S-Y. Wang [3], Y. Kazama [3], S. Kasahara [4], S. Yokota [5], T. Miatni [2], N. Higashi [2], Y. Kasahara [6], Y. Kasaba [7], S. Yagitani [6], A. Matsuoka [2], H. Kojima [7], Y. Katoh [7], K. Shiokawa [1], K. Seki [4], T. Hori [1], M. Shoji [1], S. Kurita [1], C-W. Jun [1], M. Teramoto [8], S. Matsuda [2], M.T.F. Chang [1], the ERG project group
1. Nagoya University, Japan
2. JAXA, Japan
3. ASIAA, Taiwan
4. University of Tokyo, Japan
5. Osaka University, Japan
6. Kanazawa University, Japan
7. Kyoto University, Japan
8. Kyushu Institute of Technology, Japan

	9:00	9:20	0:20	Maksim Chelpanov	Observing a sub-Alfvenic compressional magnetospheric wave with intermediate azimuthal wave number using the EKB radar and the two RBSP spacecraft

Olga Mager [1], Maksim Chelpanov [1], Pavel Mager [1], Dmitri Klimushkin [1], Oleg Berngardt [1]
1. Institute of Solar-Terrestrial Physics

	9:20	9:40	0:20	Hideaki Kawano	Amplitude-ratio and the cross-phase methods to automatically identify FLR in the SuperDARN VLOS data

Hideaki Kawano [1], Akira Sessai Yukimatu [2], Nozomu Nishitani [3], Yoshimasa Tanaka [2], Satoko Saita [4], Tomoaki Hori [3]
1. International Center for Space Weather Science and Education, Kyushu University, Japan
2. National Institute of Polar Research, and Department of Polar Science, SOKENDAI, Japan
3. Institute for Space-Earth Environmental Research, Nagoya University, Japan
4. National Institute of Technology, Kitakyushu College, Japan

Radar Technique
Chair: Bill Bristow, Todd Parris

	9:40	10:00	0:20	K. Kotyk, M. Detwiller	Borealis Project Update: A Digital Radar Design for SuperDARN Using Software-Defined Radios

K. Kotyk [1], M. Detwiller [1], K. Krieger [1], K. McWilliams [1]
1. University of Saskatchewan

	10:00	10:20	0:20	Bill Bristow	SuperDARN Developments to Enable Studies of Wave Polarizaiton

W.A. Bristow [1], Tim Theurer [1], Bryant Klug [1]
1. University of Alaska Fairbanks

	10:20	10:40	0:20		Coffee Break
	10:40	11:00	0:20	Draven Galeschuk	Optimization of ICEBEAR analysis and interferometry

Draven Galeschuk [1], Glenn Hussey [1], Devin Huyghebaert [1], Kathryn McWilliams [1], Jean-Pierre St.-Maurice [1], Juha Vierinen [2],
1. University of Saskatchewan
2. University of Tromso

	11:00	11:20	0:20	Xiang Deng	Implementation of Digital Multi-beam Forming in AgileDARN

Xiang Deng [1], Jingye Yan [2], Ailan Lan [1], Ji Wu [2], Jiaojiao Zhang [1], Wei Wang [1]
1. Key Laboratory of Microwave Remote Sensing, Chinese Academy of Sciences, Beijing, China
2. National Space Science Center, Chinese Academy of Sciences, Beijing, China.

	11:20	11:40	0:20	R. A. Greenwald	Tauscan Multipulse Sequences Alternative Multipulse Sequences and Processing that Overcome Many of the Shortcomings of Traditional SuperDARN Techniques

R. A. Greenwald [1]
1. Virginia Tech

	11:40	12:00	0:20	R. Todd Parris R. Todd Parris[1], Todd Pedersen[1] 1. Air Force Research Laboratory	Multistatic SuperDARN
	12:00	13:15	1:15		Lunch Break
	13:15	19:40	6:25		Excursion + Dinner

2019/06/06 (Thr.)

Plasma Flow and Convection
Chair: Gareth Chisham, Kathryn Macwilliams

	8:30	8:50	0:20	Adrian Grocott *A. Grocott [1], J. N. Delaney [1], M.-T. Walach [1]* *1. Lancaster University*	Azimuthal fast flows in the nightside ionosphere: interplanetary magnetic field, auroral activity and latitude dependence
	8:50	9:10	0:20	M.-T. Walach *Maria-Theresia Walach [1], Adrian Grocott [1], Frances Staples [2], Evan G. Thomas [3]* *1. Lancaster University* *2. Mullard Space Science Laboratory, University College London* *3. Thayer School of Engineering, Dartmouth College*	Influences of the equatorward SuperDARN expansion on data coverage and measured parameters
	9:10	9:30	0:20	Gareth Chisham *Gareth Chisham [1], Mervyn Freeman [1]* *1. British Antarctic Survey*	Modelling probability distributions of vorticity fluctuations in the polar ionosphere
	9:30	9:50	0:20	A. R. Fogg *A. R. Fogg [1], M. Lester [1], T. K. Yeoman [1], S. M. Imber [1], S. E. Milan [1], E. G. Thomas [2], H. Sangha [1]* *1. University of Leicester* *2. Dartmouth College*	An Improved Estimation of SuperDARN Heppner-Maynard Boundaries using AMPERE data
	9:50	10:10	0:20	Shinya Nakano *Shinya Nakano [1], Tomoaki Hori [2], Kanako Seki [3], Nozomu Nishitani [2]* *1. The Institute of Statistical Mathematics* *2. Institute for Space-Earth Environmental Research, Nagoya* *3. Graduate School of Science, University of Tokyo*	Modeling of ionospheric convection pattern with SuperDARN data using localized vector-valued basis
	10:10	10:30	0:20		Coffee Break
	10:30	10:50	0:20	Kathryn McWilliams *Kathryn McWilliams [1], Michael Earl [1]* *1. University of Saskatchewan*	A Comparison of the Auroral Electrojet Index to Overhead SuperDARN Convection Velocities
	10:50	11:10	0:20	Angeline G. Burrell *Angeline G. Burrell [1], Russell A. Stoneback [2], Manbharat Dhadly [3], Gareth Chisham [4], Tim K. Yeoman [4]* *1. U.S. Naval Research Laboratory, Washington D.C., USA* *2. University of Texas at Dallas, Richardson TX, USA* *3. British Antarctic Survey, Cambridge, UK* *4. University of Leicester, Leicester, UK*	Seasonal influences on plasma convection at solar maximum
	11:10	11:30	0:20	R. A. Stoneback *R. A. Stoneback [1], A. G. Burrell [2]* *1. The University of Texas at Dallas* *2. Naval Research Laboratory*	Characterizing the spatio-temporal response of high latitude convection using SuperDARN and DMSP

	11:30	11:50	0:20	Xiangcai Chen *Xiangcai Chen [1]* *1. Polar Research Institute of China*	Comparative Analysis of Plasma Drift Measurements Inferred from Ground-based DPS-4D and SuperDARN HF Radar over Zhongshan Station, Antarctic
	11:50	12:10	0:20	Jianjun Liu *Jianjun Liu [1], Hongqiao Hu [1], Xiangcai Chen [1]* *1. Polar Research Institute of China*	Transient ionospheric convection associated with magnetospheric sudden compression as observed by SuperDARN radar
	12:10	13:30	1:20		Lunch Break
Historical Review **Chair: Tsutomu Nagatsuma**	13:30	13:50	0:20	Natsuo Sato *Natsuo Sato [1], Tadahiko Ogawa [2], Hisao Yamagishi [1], Akira Sessai Yukimatu [1], Nozomu Nishitani [3], Takashi Kikuchi [3], Kenro Nozaki [2], Tsutomu Nagatsuma [2]* *1. National Institute of Polar Research* *2. National Institute of Information and Communications Technology* *3. Nagoya University*	History and Progress of Japanese SuperDARN Project
Dave Walker's Special Session **Chair: Ray Greenwald, Judy Stepenson**	13:50	14:10	0:20	Ray Greenwald *R. A. Greenwald [1]* *1. Virginia Tech*	Contributions of Professor A. David M. Walker to the Success and Recognition of STARE and SuperDARN
	14:10	14:30	0:20	Tim Yeoman *Tim Yeoman [1]* *1. University of Leicester*	Some highlights of Dave Walker's many contributions to ULF wave research
	14:30	14:50	0:20	Adrian Grocott *A. Grocott [1]* *1. Lancaster University*	High speed flows in the nightside ionosphere during quiet solar wind conditions
	14:50	15:00	0:10	Judy Stephenson *Judy Stephenson [1]* *1. University of KwaZulu-Natal*	Anthony David Mortimer Walker (1937-2018)
Solar Effect on HF propagation **Chair: Sessai Yukimatu**	15:00	15:20	0:20	Simon G Shepherd *Simon G Shepherd [1], Evan G Thomas [1]* *1. Thayer School, Dartmouth College*	SuperDARN Observations during the 2017 Solar Eclipse
	15:20	15:40	0:20	J. M. Ruohoniemi *S. Chakraborty [1], J. B. H. Baker [1], J. M. Ruohoniemi [1], S. Bailey [1], R. Fiori [2], N. Nishitani [3]* *1. Virginia Tech* *2. NRCan, Earth Science Sector* *3. Institute for Space-Earth Environmental Research, Nagoya University*	A Study of Effects of Solar Flares on Ionosphere and Radio Wave Propagation
	15:40	16:00	0:20		Coffee Break
Poster Session	16:00	18:00	2:00		Poster Session
	18:00	18:30	0:30		(Break)
	18:30	21:00	2:30		Banquet

2019/06/07 (Fri.)

Storm Time Disturbances

Chair: Mike Ruohoniemi, Tomo Hori

8:30	8:50	0:20	J. M. Ruohoniemi	A deep learning-based approach to forecast the onset of magnetic substorms

M. Maimaiti [1], B. Kunduri [1], J. M. Ruohoniemi [1], J. B. H. Baker [1]
1. Virginia Tech

8:50	9:10	0:20	Takuya Sori	Relationship between the large TEC fluctuation and ionospheric echoes observed by the SuperDARN radars in the auroral zone and midlatitudes during a geomagnetic storm

Takuya Sori [1], Atsuki Shinbori [1], Yuichi Otsuka [1], Takuya Tsugawa [2], Michi Nishioka [2], William Bristow [3], J. Michael Ruohoniemi [4], Simon G. Shepherd [5], Nozomu Nishitani [1]
1. Nagoya University
2. National Institute of Information and Communications Technology
3. University of Alaska
4. Virginia Tech
5. Thayer School of Engineering, Dartmouth College

9:10	9:30	0:20	Atsuki Shinbori	Temporal and spatial evolutions of storm-time ionospheric disturbances in the low and midlatitudes as seen in the GNSS-TEC and SuperDARN radar observations

Atsuki Shinbori [1], Yuichi Otsuka [1], Takuya Sori [1], Takuya Tsugawa [2], Michi Nishioka [2], William Bristow [3], J. Michael Ruohoniemi [4], Simon G. Shepherd [5], Nozomu Nishitani [1]
1. Nagoya University
2. National Institute of Information and Communications Technology
3. University of Alaska
4. Virginia Tech
5. Dartmouth College

9:30	9:50	0:20	Ashanthi Maxworth	ePOP/SWARM E and SuperDARN Observations during November 05 2018 Geomagnetic Storm

Ashanthi Maxworth [1], Glenn Hussey [1], Kathryn McWilliams [1], Eliana Nossa [2], Andrew Ya [3]
1. University of Saskatchewan
2. Naval Research Laboratory
3. University of Calgary

9:50	10:10	0:20	M.-T. Walach	SuperDARN observations during geomagnetic storms, geomagnetically active times and enhanced solar wind driving

Maria-Theresia Walach [1], Adrian Grocott [1]
1. Lancaster University

10:10	10:30	0:20	Coffee Break
10:30	11:50	1:20	Closing Session
11:50	13:10	1:20	Lunch Break

Closing Session

Chair: Tsutomu Nagatsuma

Optional tour to the Hokkaido radar site (SuperDARN Onsite School 2019) on June 8-9, 2019

SuperDARN Workshop 2019 Fuji, Japan
Posters

Category	#	Title ***Authors***
Data Processing and Analysis	1	Current Status of SuperDARN JAPAN database and website *Yuka Kadowaki [1,2,3], Akira Sessai Yukimatu [1,4], Tsutomu Nagatsuma [5], Nozomu Nishitani [6], Tomoaki Hori [6], Keisuke Hosokawa [7], Masakazu Watanabe [8], Hideaki Kawano [8], Kaori Sakaguchi [5], Aoi Nakamizo [5]* *1. National Institute of Polar Research, Tokyo, Japan* *2. Polar Environment Data Science Center (PEDSC),* *3. Res. Org. of Information and Systems (ROIS), Tokyo Japan* *4. Dep. of Polar Science, Sch. of Multidisicplinary Sciences, The Graduate Univ. for Advanced Studies (SOKENDAI), Japan* *5. National Institute of Information and Communication Technology (NICT), Japan* *6. Institute for Space-Earth Environmental Research (ISEE), Nagoya Univ. Aichi, Japan* *7. Univ. of Electro-Communications (UEC), Tokyo, Japan* *8. International Center for Space Weather Science and Education (ICSWSE), Kyushu Univ., Fukuoka, Japan*
	2	Where are we now? Moving towards adaptive, high-latitude coordinates *Angeline G. Burrell [1], Gareth Chisham [2], Steve E. Milan [3]* *1. U.S. Naval Research Laboratory, Washington D.C., USA* *2. British Antarctic Survey, Cambridge, UK* *3. University of Leicester, Leicester, UK*
	3	Identifying ground scatter and ionospheric scatter signals by using their fine structure *Oleg I. Berngardt [1], Ivan A. Lavygin [1], Valentine P. Lebedev [1], Konstantine V. Grkovich [1]* *1. Institute of Solar-Terrestrial Physics of the Siberian Branch of the RAS*
Inner Magnetosphere	4	Occurrence characteristics and geomagnetic activity dependence of SAPS observed by the SuperDARN Hokkaido East and West HF Radars *Kento Oya [1], Nozomu Nishitani [1], Tomoaki Hori [1]* *1. Institute for Space-Earth Environmental Research, Nagoya University*
	5	Superposed Epoch Analysis of Nightside Subauroral Ionospheric Convection Response to Sudden IMF Bz Turnings *M. Maimaiti [1], J. B. H. Baker [1], J. M. Ruohoniemi [1], Bharat Kunduri [1],* *1. Virginia Tech*
	6	Origin of fast fluctuation of energetic electron precipitation: Data-driven simulations using the ERG plasma wave observations *S. Saito [1], Y. Miyoshi [2], S. Matsuda [3], S. Kurita [2], Y. Kasahara [4], A. Kumamoto [5], F. Tsuchiya [5], A. Matsuoka [3]* *1. NICT* *2. ISEE, Nagoya University* *3. ISAS/JAXA* *4. Kanazawa University* *5. Tohoku University*
	7	Study of Solar Zenith Angle Dependence of Subauroral Polarization Streams Observed by the SuperDARN HF Radars *Y. Zhang [1], N. Nishitani [1], T. Hori [1], S.G. Shepherd [2], W.A. Bristow [3]* *1. ISEE, Nagoya Univ.* *2. Thayer School of Engineering, Dartmouth College* *3. Univ. of Alaska Fairbanks*
	8	Multiscape Coupling of Sub-auroral Polarization Streams Observed by the SuperDARN Hokkaido East / West radars *N. Nishitani [1], T. Hori [1]* *1. ISEE, Nagoya Univ.*

9 SECS reconstruction of ionospheric flow map from SuperDARN observations on St. Patricks day 2015 storm

T. Hori [1], N. Nishitani [1], S. Nakano [2], K. Seki [3], J. M. Ruohoniemi [4], S. G. Shepherd [5], K. Keika [3], M. Teramoto [6], A. Ieda [1]
1. ISEE, Nagoya Univ.
2. ISM
3. The Univ. of Tokyo
4. Virginia Tech.
5. Dartmouth College
6. Kyushu Institute of Technology

Magnetospheric Physics

10 High latitude signatures of the interaction of the Earths magnetosphere with an ICME

A. R. Fogg [1], M. Lester [1], S. E. Milan [1], H. Sangha [1], T. K. Yeoman [1], M. Lester [1], H. Sangha [1]
1. University of Leicester

11 Sporadic appearance of 10-ms-order flashing variation in flickering aurora

Kiyoka Murase [1], Ryuho Kataoka [2], Yoshizumi Miyoshi [3], Hervert Akihito Uchida [1], Yoko Fukuda [4], Yusuke Ebihara [5], Donald Hampton [6]
1. SOKENDAI
2. National Institute of Polar Research
3. Nagoya University
4. National Institute for Environmental Studies
5. Kyoto University
6. University of Alaska

12 Multi-point analysis of ionospheric responses to foreshock transients using SuperDARN radars

Xueling Shi [1], Joseph Baker [1], J. Michael Ruohoniemi [1], Michael Hartinger [2]
1. Virginia Tech, Blacksburg, Virginia, USA
2. Space Science Institute, Boulder, Colorado, USA

13 Fine-scale visualization of aurora in a wide area using color digital camera images from the International Space Station

Sota Nanjo [1], Yuta Hozumi [1], Keisuke Hosokawa [1]
1. The University of Electro-Communications

14 Real-time magnetosphere simulator for space weather using REProduce Plasma Universe code

Yasubumi Kubota [1], Aoi Nakamizo [1], Kaori Sakaguchi [1], Mitsue Den [1], Yuki Kubo [1], Tsutomu Nagatsuma [1], Takashi Tanaka [2]
1. National Institute of Information and Communications Technology
2. Kyushu University

15 IMF By dependence of polar cap patch occurrence: statistics using airglow data from Eureka, Canada in comparison with SuperDARN convection patterns

Keisuke Hosokawa [1], Michitaro Nagata [1], Kazuo Shiokawa [2], Yuichi Otsuka [2],
1. University of Electro-Communications
2. ISEE, Nagoya University

16 Deformation of Ionospheric Potential Pattern by Ionospheric Hall Polarization

Aoi Nakamizo[1], Akimasa Yoshikawa[2]
1. National Institute of Information and Communications Technology, Japan
2. Faculty of Sciences, Kyushu University

MTI

17 New methods for studying atmospheric winds and tides in SuperDARN meteor scatter using data from the mid-latitude Falkland Islands radar

Gareth Chisham[1], Neil Cobbett[1]
1.British Antarctic Survey

18 Spatially Resolved Neutral Wind Response Times During High Geomagnetic Activity Above Svalbard

D. D. Billett [1], J. A. Wild [1], A. Grocott [1], A. L. Aruliah [2], A. M. Ronksley [2], M.-T. Walach [2] M. Lester [2]
1. Lancaster University
2. University College London

19 Multi Taper Analysis of a MSTID event above Antarctica

T. Atilaw [1], J.A.E. Stephenson [2], Z. Katamzi-Joseph [1]
1. South African National Space Agency
2. School of Chemistry and Physics, University of KwaZulu-Natal

20 Temporal and spatial variation of GPS TEC and phase scintillation during substorms and auroral breakups

Paul Prikryl [1,2], James M. Weygand [3], Reza Ghoddousi-Fard [4], P. T. Jayachandran [2], David R. Themens [2], Anthony M. McCaffrey [2], Bharat S. R. Kunduri [5], Emma Spanswick [6], Yongliang Zhang [7], Akira Sessai Yukimatu [8],
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2. Geomagnetic Laboratory, Natural Resources Canada, Ottawa, ON, Canada
3. Earth, Planetary and Space Sciences, University of California, Los Angeles, CA, USA
4. Canadian Geodetic Survey, Natural Resources Canada
5. Bradley Dept. of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA, USA
6. Dept. of Physics and Astronomy, University of Calgary, AB, Canada
7. Johns Hopkins University Applied Physics Lab, Laurel, MD, USA
8. National Institute of Polar Research, Tokyo, Japan

Plasma Flows and Convection

21 Real-time global convection mapping

Evan Thomas [1], Simon Shepherd [1]
1. Dartmouth College

22 A new way to identify and quantify the sources of ionospheric convection

Jone Peter Reistadl [1], K. M. Laundal [1], A. Ohma [1], E. G. Thomas [2], N. Østgaard [1], S. Haaland [1,3], K. Oksavik [1,4], S. E. Milan [5,1],
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2. Thayer School of Engineering, Dartmouth College, Hanover, USA
3. Max Planck Institute for Solar System Research, Göttingen, Germany
4. Arctic Geophysics, University Centre in Svalbard, Longyearbyen, Norway
5. Department of Physics and Astronomy, University of Leicester, Leicester, UK

23 Origin of the twin reverse convection cells for northward interplanetary magnetic field periods

Masakazu Watanabe [1], Shigeru Fujita [2], Takashi Tanaka [1]
1. Kyushu Universit
2. Meteorological College

24 Velocity of SuperDARN echoes at intermediate radar ranges

A.V. Koustov [1], M. R. Luciuk [1], R.G. Gillies [2]
1. University of Saskatchewan, Saskatoon, Canada
2. University of Calgary, Calgary, Canada

25 Direct-From-Data Basis Functions for SuperDARN Flow Characterisation and Prediction

Robert Shore [1], Mervyn Freeman [1], Gareth Chisham [1]
1. British Antarctic Survey

Radar Technique

26 Design of Low-Cost Software Defined Radio for SuperDARN Radar

Paul Kennedy [1], J. Michael Ruohoniemi, PhD [1], Kevin Sterne [1], Robert McGwier, PhD [1], Joseph Baker, PhD [1]
1. Virginia Tech

27 Using Tauscan-11 to Measure Phi0

R. A. Greenwald [1]
1. Virginia Tech

28 RadioICE: A bistatic multi-frequency HF Sounder in Antarctica

Alex T. Chartier [1], Ethan S. Miller [1]
1. Johns Hopkins APL

Wave Propagation and its Characteristics

29 A raytracing simulation of HF ionospheric radar performance at African equatorial latitudes

C. M. Michael [1], T. K. Yeoman [2], D. M. Wright [1], S. E. Milan [1], M. K. James [1]
1. Department of Physics and Astronomy, University of Leicester, UK.

30 Polarization Measurements of Proton Whistlers and other Natural Low-Frequency Radio Emissions Observed by ePOP- RRI

Ashanthi Maxworth [1], Glenn Hussey [1], Fraser Hird [1], George Sofko [1], Gordon James [2], Andrew Yau [2]
1. University of Saskatchewan
2. University of Calgary

31 A network of HF Doppler sounding systems in Japan: possible collaboration with SuperDARN

Keisuke Hosokawa [1], Hiroyuki Nakata [2], Kumiko Hashimoto [3], Ichiro Tomizawa [1], Jun Sakai [1], Takashi Kikuchi [4], Kenro Nozaki [5]
1. University of Electro-Communications
2. Chiba University
3. Kibi International University
4. ISEE, Nagoya University
5. National Institute of Information and Communications Technology

32 Variations in PolarDARN Doppler characteristics

G. Burrell [1], Clayton Coker [1]
1. U.S. Naval Research Laboratory, Washington D.C., USA

33 Simulations and Measurements of Radio Frequency Radiation (RFR) for a SuperDARN Radar

Kevin Sterne [1], Kevin Krieger [2]
1. Virginia Tech
2. University of Saskatchewan

34 Echo occurrence in the polar ionosphere as measured by Dome C East radar

Maria Federica Marcucci [1], Igino Coco [2], Stefano Massetti [1], Simona Longo [3], David Biondi [1], Enrico Simeoli [4], Aurélie Marchaudon [5], Alexandre Koustov [6], Victoriya Forsythe [7], Giuseppe Consolini [1],
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3. CNR-Dipartimento Terra Ambiente, Rome, Italy
4. CNR-Dipartimento Reti e Sistemi Informativi, Rome, Italy
5. Institut de Recherche en Astrophysique et Planétologie, Toulouse, France
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7. University of Alaska, Fairbanks, USA

35 Numerical Modelling of SuperDARN HF Radio Propagation in a Realistic Ionosphere

Etienne Foucault [1], Pierre-Louis Blelly [1], Aurélie Marchaudon [1], Sébastien Trilles [2]
1. IRAP (CNRS, UPS, CNES), Toulouse, France
2. Thales Alenia Space, Toulouse, France

36 Collaborative ionosheric observations using VIPIRs in Japan and Korea

Takuya Tsugawa [1], Michi Nishioka [1], Hideo Maeno [1], Takumi Kondo [1], Mamoru Ishii [1] Jong-Yeon Yun [2], Young-Sil Kwak [3]
1. National Institute of Information and Communications Technology, Japan
2. Korean Space Weather Center, National Radio Research Agency, Korea
3. Korea Astronomy and Space Science Institute, Korea

37 Receiving the SuperDARN Hokkaido East HF radar signal at a remote station using the USRP

Y. Hamaguti [1], N. Nishitani [1], T. Hori [1]
1. ISEE, Nagoya Univ.

38 Reassessment of SuperDARN/SENSU near-range echoes

Akira Sessai Yukimatu [1]
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