Commission H

Session	Title	Convener names & e-mails	Number of slots
H01	Open session	J. Lichtenberger, J. Manninen lityi@sas.elte.hu, Jyrki.Manninen@sgo.fi	20
Description: This session solicits papers on all aspects of waves in space and laboratory plasmas that do not easily fit into other sessions within Commission H, including solar, planetary, and interplanetary plasmas, spacecraft-plasma interactions, applications to space weather, the use of space as a laboratory, spacecraft and laboratory instrumentation, and latest results from recently launched spacecraft missions and laboratory experiments.			

Session	Title	Convener names & e-mails	Number of slots
H02	Macro/micro-scale kinetic processes at natural boundary layers in terrestrial and planetary environments	B. Lembege, P. Escoubet, H. Zhang, I. Shinohara bertrand.lembege@latmos.ipsl.fr, philippe.escoubet@esa.int, hzhang14@alaska.edu iku@stp.isas.jaxa.jp,	20
Description: Natural frontiers play a important role in the energy and momentum transfert between the solar wind and the planetary magnetosphere and/or between different regions within the magnetosphere itself. Intricated microscopic/macroscopic processes take place there over micro/meso/macro-scales. These processes are based on various nonlinear effects, nonstationary mechanisms and wave-particle interactions, which control the overall dynamics of these frontiers. The session welcomes presentations of recent results issued from theory, mono/multi-dimensional numerical simulations and experimental data obtained from various space missions. The comparison between these approaches is possible thanks to high sampling rate of measurements obtained on board of recent multi-spacecraft missions (e.g. MMS) and to high resolution local/global simulations. Comparison with data issued from other missions are also encouraged. Applications include magnetospheric, ionospheric and space plasma physics. Contributions related to these topics are very welcome. Typical boundary layers may include: (i) foreshocks regions/collisionless shocks, (ii) the magnetopause, (iii) plasma sheet currents, (iv) nearby/far magnetotail dynamics and dipolarisation front, (vi) potential drops in the ionosphere and cusp dynamics, and (vii) basic particle acceleration processes. Comparative analysis of results dedicated to terrestrial and planetary environments are also encouraged.			

Session	Title	Convener names & e-mails	Number of slots
H03	Multipoint and ground-based observations of magnetospheric wave phenomena, remote sensing of plasmasphere	C. Kletzing, W. Li, B. Heilig, A. Jorgensen and Y. Kasahara craig-kletzing@uiowa.edu, moonli@atmos.ucla.edu, heilig.balazs@mbfsz.gov.hu, andersmjorgensen.nmt@gmail.com, kasahara@is.t.kanazawa-u.ac.jp	20

Description: With the wide range of different spacecraft now orbiting the Earth combined with ground measurements at many locations, the possibility of comparing wave measurements from multiple spacecraft and comparison with ground observations has become a reality. Such comparisons enable understanding of phenomenon such as the evolution of wave fields along magnetic field lines as well as spatial extent of wave phenomena and the global distributions of different wave modes. Magnetospheric wave properties are also used to specify geospace environment including remote sensing of the plasmasphere. This session solicits all types of multi-point wave measurements from the ground or spacecraft observations that advance our understanding of a wide range of wave phenomena.

Session	Title	Convener names & e-mails	Number of slots
H04-05	Wave-particle Interactions, their Acceleration and Loss Effects on Planetary Radiation Belts and Drivers.	R. Horne, C. Kletzing, J. Albert, D. Shklyar, C. Rodger, M. Clilverd R.Horne@bas.ac.uk, jay.albert@us.af.mil, david@iki.rssi.ru, craig.rodger@otago.ac.nz, macl@bas.ac.uk	40

Description: Wave particle interactions are among the most important processes in space plasma physics at the Earth and planets. They play a major role in the acceleration of electrons to relativistic energies that form the radiation belts and contribute significantly to electron loss into the atmosphere over a wide range of energies. They are also responsible for proton loss from the ring current and for heating of low energy electrons and ions. Satellite missions such as Van Allen Probes, ARASE and DEMETER provide a wealth of observational data, and missions such as DSX provide data to test basic physical processes. Here we invite papers on all aspects of wave-particle interactions, including observations, modelling and their wider role in planetary magnetospheres.

Particle precipitation into the atmosphere is believed to be one of the dominant mechanisms for the loss of energetic electrons from the Van Allen radiation belts, as well as losses of ring current ions. Wave-particle interactions with ULF through to VLF waves are thought to be important drivers of these loss-events. This session is targeted at both ground-based and satellite experimental observations, as well as theoretical investigations, into the precipitation of energetic (>10 keV) to relativistic energy electrons or precipitation of ring current ions.

Papers considering wave-particle interactions driving losses, measurement of loss fluxes, or the effects of this precipitation on the ionosphere are welcome.

Session	Title	Convener names & e-mails	Number of slots
H06	Radio science for space weather science and operations	M. Messerotti, V. Pierrard and N. Vilmer, Nat Gopalswamy messerotti@oats.inaf.it, Viviane.Pierrard@aeronomie.be, nicole.vilmer@obspm.fr	15

Description: Space Weather perturbations are triggered by plasma processes that occur at the originating sources, e.g. magnetic reconnection causing heating, particle and plasmoid accelerations. Further plasma processes occur during propagation through the interplanetary medium where shocks and particle beams form. Finally, a wealth of processes occur through interaction with planetary magnetospheres and ionospheres. All these processes are characterised by radio emissions specific to each plasma process. Hence, radio science represents a key investigative tool for space weather phenomena including triggering, propagation and interaction. Radio physics and radio instrumentation are conceptual and experimental tools, respectively, which are needed to provide a complete analysis framework. This session is open to contributions both on radio physics for the advancement of science underpinning space weather phenomena, and for radio physics for the advancement of space weather operations, i.e., applied to space weather phenomena detection, characterisation, analysis and forecasting, as well as to ongoing and planned projects for space- and ground-based radio studies in this field.

Session	Title	Convener names & e-mails	Number of slots
H07	A tribute to Donald Carpenter	Janos Lichtenberger, Robert Marshall and Fabien Darrouzet Robert.Marshall@colorado.edu, Fabien.Darrouzet@aeronomie.be	10

Description: Donald Carpenter, who discovered the plasmapause by whistlers, passed away on 5 February 2019. He was a research professor for over 40 years at the Space Telecomunications & Radio Science Laboratory (STAR Lab) at Stanford University. Using naturally-occurring and manmade very low frequency (VLF) waves as a tool to probe the upper atmosphere, Don made significant contributions to many areas of magnetospheric physics. This session will be devoted to his contributions as well as presenting the state of the art on those areas he made the pioneering steps.

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contributions to many areas of magnetospheric physics, including the discovery of the plasmapause, pioneering studies of the plasmasphere structure and dynamics, and the development and use of whistler-mode waves as diagnostic probes of the magnetosphere.

This session will be devoted to his contributions as well as the presentation of recent research in those areas where he made the pioneering steps. Contributions are solicited related to plasmasphere structure and dynamics, whistler wave propagation and probing of the magnetosphere, lightning and VLF transmitter effects in the magnetosphere, and related areas.

Session	Title	Convener names & e-mails	Number of slots
H08	Plasma waves around the moon and small bodies	Satyavir Singh, Tomoko Nakagawa, Masaki N Nishino satya1168@gmail.com, nakagawa@tohtech.ac.jp, mnishino@isee.nagoya-u.ac.jp	20

Description: Interaction between the moon and surrounding plasma modifies the electromagnetic environment and the plasma distribution function around the moon that can be a rich sources of various wave activities.
The aim of this session is to focus on observations, theory data analysis, and simulations of plasmas and wave processes around the moon, including the planetary moons and small bodies such as comet 67P/Churyumov- Gerasimenko.