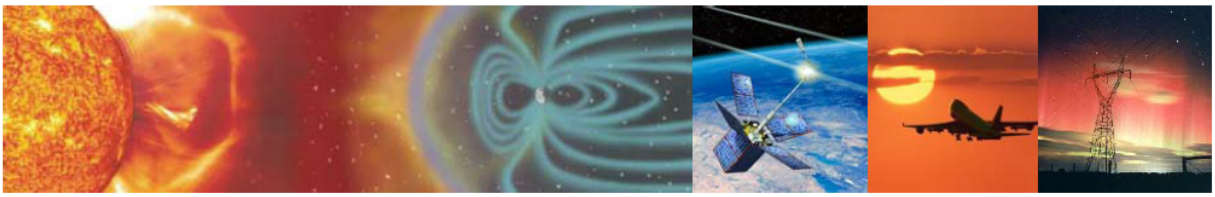
The UN/US International Space Weather Initiative Workshop: The Decade after the International Heliophysical Year 2007
31 July – 4 August, 2017

Boston College
Chestnut Hill, Massachusetts, USA

This workshop marks the 10th anniversary of the International Heliophysical Year, which led to the genesis of the International Space Weather Initiative. It is organized jointly by the United Nations Office of Outer Space Affairs (UNOOSA), the National Aeronautics and Space Administration (NASA) and Boston College to highlight the achievements made over the past ten years and to show-case the worldwide development of science, capacity building and outreach.



Local Organizing Committee

We thank the Boston College for their gracious and generous support as hosts of this symposium.

We specifically thank the Local Organizing Committee for their tireless efforts.

Patricia Doherty
Keith Groves
David Webb
Endawoke Yizengaw
Daneille Berzinis
Andrea Murphy
Sean O'Connell
Susan Delay

Scientific Organizing Committee

This meeting was designed and organized by an international group of space weather scientists:

Nat Gopalswamy	USA	Chair, NASA/GSFC
Sharafat Gadimova	Austria	Co-chair, UNOOSA
K.S. Balasubramaniam	USA	Air Force Research Laboratory
Christine Amory-Mazaudier	France	GPS Africa
Christopher Cannizzaro	USA	U.S. Department of State
Patricia Doherty	USA	ISWI Workshop Coordinator
Shing Fung	USA	NASA/GSFC
Katya Georgieva	Bulgaria	SCOSTEP/VarSITI
J. Americo Gonzalez-Esparza	Mexico	MEXART, Instituto Geofisica, UNAM
Keith Groves	USA	Scintillation Networks
Norbert Jakowski	Germany	SOFIE and GIFDs
Masha Kuznetsova	USA	CCMC, NASA
Ian Mann	Canada	University of Alberta
Richard Marshall	Australia	Australian Space Weather Services
Nariaki Nitta	USA	Lockheed Martin
Terry Onsager	USA	NOAA Space Environment Prediction Ctr.
Babatunde Rabiu	Nigeria	NASRDA
Jean-Pierre Raulin	Brazil	South American VLF NETwork (SAVNET)
Kazunari Shibata	Japan	CHAIN Project
Elsayed R. Tallat	USA	NASA/HQ Heliophysics
Barbara Thompson	USA	IHY+10, NASA/GSFC
Chi Wang	China	Space Weather Meridian
Akimasa Yoshikawa	Japan	MAGDAS

Sponsors

The organizers of the United Nations/United States of America Workshop on the International Space Weather Initiative are grateful to the following sponsors for their contribution:

Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)

National Aeronautics and Space Administration (NASA)

International Committee on Global Navigation Satellite Systems (ICG)

National Science Foundation (NSF)

Boston College

Universities Space Research Association (USRA)

WORKSHOP LOGISTICS

Technical Sessions: All technical sessions will take place in the **Heights Room at Corcoran Commons** on Boston College's main Chestnut Hill lower campus. The Heights Room is on the second floor of Corcoran Commons. An elevator is available.

To get to Corcoran Commons by car or taxi:
Navigate to St. Ignatius of Loyola Church, 28 Commonwealth Ave, Chestnut Hill, MA. Turn onto St. Thomas More Road or Fr. Herlihy Drive – passing in front of St. Ignatius Church. Enter the university via the gate next to the church. Corcoran Commons is the third building on the left.

To get to Corcoran Commons by public transportation
Take the Boston College branch of the MBTA's "Green Line" (B) to the last stop at Boston College on Commonwealth Avenue. Cross the street toward St. Ignatius Church. Take a right turn after the church onto the campus and continue walking to Corcoran Commons – it will be on your right.

Registration: The Registration Desk will be open every day beginning at 8:00AM. Please note that all participants must have pre-registered for the workshop. We are not able to permit non-registered participants.

Catering: Continental Breakfast will be served each day beginning at 8:00 in a room adjacent to the Heights Room. Lunch and coffee break refreshments will also be provided for participants.

Parking: If you are bringing a car onto the campus, you may park in the BC Commonwealth Avenue garage for a fee of $10/day.

Accommodations: For those staying on campus, accommodations will be in Stayer Hall, just a short walk from Corcoran Commons.

Directions: Please see our website for directions to the campus via all means of transportation (iswi2017.bc.edu).

Lower campus map with locations of Corcoran Commons, the MBTA Green Line Stop, the Commonwealth Avenue Garage and Stayer Hall highlighted.

TECHNICAL PROGRAM

Monday, 31 July – International Framework for Space Weather Services

08:00 Registration and Continental Breakfast

09:00 Opening Remarks, Chair: Patricia Doherty, Boston College
Dr. Thomas Chiles Vice Provost for Research, Boston College
Dr. Nat Gopalswamy, Chair of the Scientific Organizing Committee, NASA
Mr. Ken Hodgkins, Director of Space and Advanced Technology, Department of State
Ms. Simonetta Di Pippo, Director, UN Office for Outer Space Affairs (UNOOSA)

09:30 Introduction to UN/US Activities, Chair: Terry Onsager, NOAA
Keynote 1: Developments within the United Nations, Simonetta Di Pippo, UNOOSA
Keynote 2: UNISPACE+50, David Kendall, COPUOS Chair
Keynote 3: US National Space Weather Strategy and Action Plan, William Murtagh, National Weather Service (NWS)

10:30 Coffee Break

11:00 Session 1: International Recognition of Space Weather Risks
Panel: Space Weather Risks and Mitigation Needs, Moderator: Bill Murtagh, NWS
UK Risk Assessment and Economic Impact Study, Mario Bisi, RAL, UK
ESA Cost Benefit Analysis, Luca Del Monte, European Space Agency (ESA)
US Economic Impact Study, Stacey Worman, Abt Associates
Civil Contingency Perspective, TBD, US Department of Homeland Security
ICAO Proposed Aviation Service Requirements, Raul Romero, ICAO

12:30 Lunch Break – Lunch will be served just outside the meeting space

13:30 Session 2: Building on Today's Space Weather Foundation
Panel: Improving Research for Operational Services, Moderator: Siqing Liu, National Space Science Center (NSSC), China
US Research Programs to Improve Services, Steven Clarke, NASA
National Science Foundation Space Weather Research, Irfan Azeem, NSF
EU/ESA Research Programs to Improve Services (H2020, ESA SSA), Juha-Pekka Luntama, ESA
Asia/Oceania Space Weather Alliance, Mamoru Ishii, NICT, Japan
African Research Programs and the African Geophysical Society, Paul Baki Olande, Technical University of Kenya

15:00 Coffee Break

15:20 Panel: Observing Infrastructure, Moderator: Richard Marshall, Bureau of Meteorology, Australia
US Observing Infrastructure, TBD
EU/ESA Observing Infrastructure, Mario Bisi, Rutherford Appleton Lab, UK
Meridian Project, Chi Wang, NSSC, China
Africa Observing Infrastructure, Babatunde Rabiu, NSRDA, Nigeria
South American Observing Infrastructure, Joaquim Rezende Costa, INPE, Brazil

17:00 End

Please join us for a Welcome Reception on 31 July from 17:30 to 19:30 at Boston College's Gasson Hall 100 – The Irish Room

Tuesday, 1 August, International Framework for Space Weather Services Continued

08:00 Registration and Continental Breakfast

09:00 Summary of Previous Day and Workshop Goals, Terry Onsager
09:15 Building on Today's Space Weather Foundation (Continued)
Panel: International Elements of a Coordination Framework, Moderator: Chris Cannizzaro, State Department
WMO Four-Year Plan for Space Weather Activities: T. Kurino, WMO
International Space Environment Service, Terry Onsager, NWS
Coordination Group for Meteorological Satellites, Elsayed Talaat, NASA
COPUOS Space Weather Guidelines and Expert Team, Ian Mann, U. of Alberta, Canada
International Space Weather Initiative, Nat Gopalswamy, NASA
COSPAR Space Weather Roadmap, Len Fisk, University of Michigan
10:30 Coffee Break

11:00 Session 3: Developing an International Framework for Space Weather Services
Moderator: Ian Mann, University of Alberta, Canada
Summary of Draft Document for Framework
Open Discussion of Current Capabilities and Recommended Actions
Recommendations for UNISPACE+50 Thematic Priority 4

12:00 Lunch

Tuesday, 1 August, The International Space Weather Initiative Workshop

13:00 IHY+10: The Origins of ISWI, Chair: Barbara Thompson

13:05 Beginnings of the International Heliophysical Year and the International Space Weather Initiative (Invited), J. Davila, NASA, USA

13:25 Balkan, Black Sea, and Caspian Sea Network for Space Weather Studies (Invited), K. Georgieva, Bulgarian Academy of Science, Bulgaria

13:45 Establishing the IHY Asia-Pacific Program (Invited), A. Yoshikawa, Kyushu University, Japan

14:05 The IHY/ISWI Education and Public Outreach Programs and the SID Space Weather Monitors - A Retrospective (Invited), D. Scherrer, Stanford University Solar Center, USA

14:25 From the IGY to the ISWI: A Perspective view of the importance of international cooperation in geo-heliophysics, S.M. Radicella, ICTP, Italy

14:40 Africa and Space Weather Research: Review of Deployed Instruments and Scientific Results from IHY to ISWI (2007 - 2017), A.B. Rabiu, NASRDA, Nigeria

14:55 Kristian Birkeland - The Almost Forgotten Scientist and Father of the Sun-Earth Connection, P. Brekke, Norwegian Space Center, Norway

15:10 Instrumenters Panel: Christine Amory-Mazaudier, Keith Groves, Jean-Pierre Raulin, Deborah Scherrer, Chi Wang, Endawoke Yizengaw, Akimasa Yoshikawa
Chair: Barbara Thompson

15:40 Coffee Break

16:00 Scientific Results on the Interplanetary Medium and Geospace
Chairs: David Webb, USA & Katya Georgieva, Bulgaria

16:05 A report on Cube- and Small-Sats and the System Science of NASA's Living with a Star Program, M. Guhathakurta

16:20 Studies of Solar Eruptions using type II Bursts from Ground and CMEs from Space, N. Gopalswamy, NASA, USA

16:35 Current State of Reduced Solar Activity: Space Weather Events in the Inner Heliosphere, P.K. Manoharan, National Centre for Radio Astrophysics, India

16:50 Study of Space weather events of Solar cycle 23 and 24 and their Geoeffectiveness, B. Veenadhari, Indian Institute of Geomagnetism, India

17:05 Transportation, acceleration and loss of electrons in the slot region responsible for the formation of new radiation belt during big magnetic storm, T. Obara, Tohoku University, Japan

17:20 Impulsive Energy Transfer via Joule Heating from the Magnetosphere to the Ionosphere during Geomagnetic Storms, L. Zanetti, NOAA, USA

17:35 End

Wednesday, 2 August, The International Space Weather Initiative Workshop

08:00 Registration and Continental Breakfast

09:00 Scientific Results on the Ionosphere and Thermosphere
Chairs: Endawoke Yizengaw, USA & Richard Marshall, Australia

09:05 New findings using VLF data from SAVNET and Kannuslehto radio receivers, E. L. Macotela, Sodankyla Geophysical Observatory, Finland
09:20 Control of Gravity Waves on Equatorial Spread F Day-to-day Variability; an Empirical Approach, G. Manju, Vikram Sarabhai Space Center, Kerala, India
09:35 Do countries under the Equatorial Electrojet belt should worry about Geomagnetically Induced Currents? E. Yizengaw, Boston College, USA
09:50 Multi-nation Coordinated Monitoring of Ionospheric Weather by means of High Frequency Sounding, I. Galkin and B. Reinisch, UMass Lowell, USA
10:05 Early results of ionospheric observations from LITES on the ISS, S. Finn, UMass Lowell, USA
10:20 Evidence of Madden-Julian oscillation effects in the mesosphere and lower thermosphere form GOCE and MERRA/TIME-GCM, F. Gasperini, Utah State University, USA
10:35 Coffee Break
11:00 Latest scientific results of MAGDAS project, A. Fujimoto, Kyushu University, Japan
11:15 **S**pace Weather Effects on Critical Operations and Activity in the High North, P. Brekke, Norwegian Space Center, Norway

11:30 Space Weather Instruments 1
Chairs: Jean-Pierre Raulin, Brazil and Keith Groves, USA

11:40 The AWESOME Program: VHF/LF Remote Sensing of the Ionosphere and Magnetosphere form IHY to ISWI and beyond, M. Cohen, Georgia Tech, USA
11:55 The South America VLF Network – SAVNET: Last results and new research perspectives, J.P. Raulin, Mackenzie Presbyterian University, Brazil
12:05 Future Solar and Interplanetary Radio Instrumentation for Space Weather Studies in China, Y. Yan, Chinese Academy of Sciences, China
12:20 Questions

12:30 Lunch Break

13:30 Space Weather Instruments Continued
13:35 Monitoring and investigation of geospace disturbances along the 120E/60W longitudes: International Meridian Circle Project, S. Zhang, MIT Haystack Lab, USA
13:50 The MAGDAS project the past and next 10 years, A. Yoshikawa, Kyushu University, Japan
14:05 The recent progress of CHAIN Project and the method for utilizing its data for space weather prediction, K. Shibata, Kyoto University, Japan
14:20 Inner-Magnetospheric Array for Geospace Science, iMAGS, E. Yizengaw, Boston College, USA

14:35 The AFINSA Network: Presentation, Scientific Objectives, First Results, J.P. Raulin, Mackenzie Presbyterian University, Brazil
14:50 The Low-Latitude Ionospheric Sensor Network: Recent Scientific Results, C. Valladares, University of Texas, USA
15:05 SCINDA Scintillation Sensor Network: Sites, Systems and Science, K. Groves, Boston College, USA
15:20 The Worldwide Interplanetary Scintillation (IPS) Stations (WIPSS) as a Potential Future ISWI Instrument, M. Bisi, Rutherford Appleton Lab, UK
15:35 **G**IFDS - one of the ISWI Instruments, D. Wenzel, German Aerospace Center, Germany

16:00 – 18:00 POSTER SESSION WITH REFRESHMENTS

On the balcony just outside the meeting space.

Please have posters up today before the afternoon coffee break.
Whiteboards, pins and tape will be provided.
Whiteboards will be numbered according to the poster list.

Whiteboard size is 36” x 48” on a horizontal landscape.

Refreshments will be served.
List of posters are at the end of this program.

Thursday, 3 August, The International Space Weather Initiative Workshop

08:00 Registration and Continental Breakfast

09:00 Space Weather Modeling 1: From Sun to Geospace
Chairs: Renato Filjar, Croatia and Masha Kuznetsova, USA

09:05 Challenges and Opportunities in Solar-Heliospheric Modeling for Space Weather Prediction (Invited), J. Karpen, NASA, USA
09:25 Modeling and Forecasting the Geospace Environment (Invited), T. Gombosi, University of Michigan, USA
09:45 Norwegian contributions to the ISWI program, K.M. Laundal, University of Bergen, Norway

Extreme Space Weather

10:00 Predictability of Extreme Space Weather, Surjalal Sharma, University of Maryland, USA
10:15 On the Energetics of Large Geomagnetic Storms, W. Burke, Boston College, USA
10:30 Coffee Break

10:55 Space Weather Modeling 2: Near-Earth Radiation and Plasma Environment
Chairs: Masha Kuznetsova, USA and Renato Filjar, Croatia

11:00 Long term and short term forecasts of the radiation and plasma environment near Earth: Identifying needs and delivering value (Invited), T. Paul O'Brien, The Aerospace Corporation, USA
11:20 Space Hazards Induced near Earth by Large Dynamic Storms (SHIELDS), R. Friedel, Los Alamos National Laboratory, USA

Ionosphere-Thermosphere Variability

11:35 From Discovery to Operations: Whole Atmosphere-Ionosphere Physical Models for Space Weather Applications (Invited), T. Fuller-Rowell, University of Colorado, USA
11:55 An IGS-based simulator of ionospheric conditions for GNSS positioning quality assessment, R. Filjar, University of Rijeka, Croatia
12:10 Local Ionosphere Modelling using GNSS Reference Stations Network, M. Bouziani, Department of Geodesy, Rabat, Morocco
12:25 Closing Remarks

13:30 International Outreach and Capacity Building
Chairs: Sharafat Gadimova, Austria and Patricia Doherty, USA
13:35 ICG and its programme on GNSS applications, S. Gadimova, UNOOSA
13:50 ISWI Outreach and Capacity Building Activities, N. Gopalswamy, NASA, USA
14:05 The need for training integrating knowledge from the Sun to the Earth, C. Amory-Mazaudier, LPP Polytehcnique, France and ICTP, Italy
14:20 The Boston College/Abdus Salam International Centre for Theoretical Physics Collaboration and Outreach Workshops, P. Doherty, Boston College, USA

14:35 Girls InSpace project: A new physics outreach initiative, A. Abe Pacini, InSpace, LLC, USA

14:50 A Collaborative Approach at Building Capacity in Space Weather at the Undergraduate Student Level, M. Chantale Damas, CUNY, Queensborough Community College, USA

15:05 The National Space Weather Program: Two Decades of interagency partnership and accomplishments, M. Bonadonna, NOAA, USA

15:20 Short Break before the Excursion

16:00 – 21:00 Excursion and Banquet

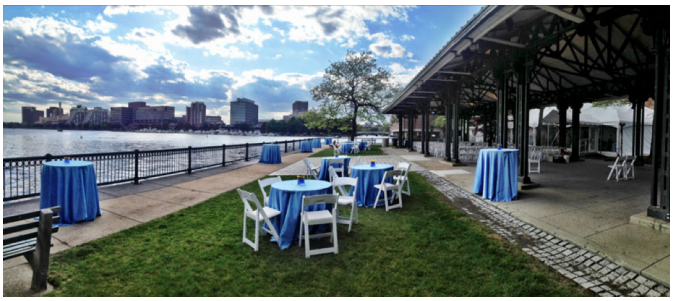
Please join our excursion to Boston's Museum of Science (http://www.mos.org). Participants will have free time to roam the museum and then meet in the Washington Pavilion at 18:30 PM for a Workshop Banquet.

(www.mos.org)

The **Museum of Science** (**MoS**) is a science museum and indoor zoo in Boston, Massachusetts. Along with over 700 interactive exhibits, the museum features a number of live presentations throughout the building every day, along with shows at the Charles Hayden Planetarium and the Mugar Omni Theater, the only domed IMAX screen in New England. The museum is also an accredited member of the Association of Zoos and Aquariums (AZA) and is home to over 100 animals, many of which have been rescued and rehabilitated from various dangerous situations.

The Workshop Banquet will take place in the Museum's Washburn Pavilion beginning at 6:30PM. This open-air pavilion is located directly on the Charles River with views of the Boston and Cambridge skylines. With refreshing breezes, cooling shade trees, and beautiful views, it's the perfect spot to socialize and dine under a protective tent.

Van de Graaff Generator Demonstration — Wikipedia:Markus Poessel



Washburn Pavilion (www.mos.org)

Friday, 4 August, The International Space Weather Initiative Workshop

08:00 Registration and Continental Breakfast

09:00 Coordination of Space- and Ground-based Data Resources and ISWI
Chairs: Shing Fung, USA & Terry Onsager, USA

09:05 NASA and International Open Standards and the Future of Space Weather Studies (Invited), D. Aaron Roberts, NASA, USA

09:25 NASA Data Resource and the International Space Weather Initiative (Invited), R. McGuire, NASA, USA

09:45 ESA heliophysics archives: a key asset for ISWI (Invited), A. Masson, European Space Agency, France

10:05 JAXA's Contribution to Space Weather; Arase and other satellites (Invited), N. Higashio, JAXA, Japan

10:25 Coffee Break

10:50 The Los Alamos Laboratory: Space Weather Research and Data (Invited), R. Friedel, Los Alamos National Laboratory, USA

11:10 Imaging Science Contributions to space weather research using geomagnetic conjugate point observations: latitude coupling - North & South America/Europe & Africa (Invited), M. Mendillo, Boston University, USA

11:30 Space Weather Resources available through MIT Haystack's Madrigal Database (Invited), A. Coster, MIT Haystack Laboratory, USA

11:50 Report on the "L5 in Tandem with L1: Future Space-weather Missions Workshop" - Working Towards a L5 Operational Swx Mission, M. Bisi, Rutherford Appleton Lab, UK

12:05 **G**eophysics using the Hubble Space Telescope, G. Tancredi, University de la Republica, Uruguay

12:20 Ionopsheric TEC Assimilation and Now-casting System over China, Ercha A, Chinese Academy of Sciences, China

12:35 Lunch Break

13:35 Coordination of Space- and Ground-based Data Resources and ISWI - Continued
Chairs: Shing Fung, USA & Terry Onsager, USA

13:40 Ionospheric prediction tools in IPS-EU Project, V. Romano, INGV, Italy

13:55 The requirement analysis for user-oriented space weather products and services, S. Liu, Chinese Academy of Sciences, China

14:10 Mexican Space Weather Strategy, G. Mendez, Mexican Space Agency, Mexico

14:25 **I**SWI Open Data Policy: An instrument of International Cooperation, S. Fung, NASA, USA

14:45 Final Discussion: Observations, Recommendations and the Way Forward
Chair: Nat Gopalswamy, NASA

15:30 END

POSTERS

Country Posters			
Poster #	**Country**	**Title**	**Presenter**
1	African Region	African Participation in IHY and ISWI (2007-2017): Benefits and Implications for Space Weather Research	A.B. Rabiu
2	Australia	Space Weather Activities in Australia	R. Marshall
3	Austria	Space Weather Activities in Austria	Manuela Temmer
4	Argentina	National Space Weather Activities of Argentina	Ana Elias
5	Azerbaijan	Science Development Foundation (SDF) Baku	Elchin Babayev
6	Bulgaria	Space Reserch and Technology Institute, Bulgarian Academy of Sciences	Katya Georgieva
7	Brazil	Brazilian Space Weather Program with New	J.E.R. Costa
8	Ecuador	Ecuadorian Geomagnetic Station (MAGDAS equipment):	Ericson Lopez
9	Egypt	Space Weather Center Activities in Egypt (Space Weather Monitoring Center)	Nada Ellahouny
10	Ethiopia	Space Science (Space Weather) activities in Ethiopia	Melessew Nigussie
11	Germany	Space weather activities in Germany	Daniela Wenzel
12	India	Space Weather Activities in India	P.K. Manoharan
13	Indonesia	Space Weather Program In Indonesia	Dhani Herdiwijaya
14	Kenya	Space Weather Research and Development in Kenya: 2008-2017	Paul Baki Olande
15	Kazakstan	Kazakstan's center for diganostics of near-Earth space and forecast of space weather	Zh. Zhantayev
16	Mexico	Instrumentation for Space Weather Activities: The Mexican Experience	E. Aguilar-Rodrigues
17	Nepal	Space Weather Initiative and Its Application in Nepal	Krishna Bhandari
18	Nigeria	Advances in Space Weather Research and Operations in	A. B. Rabiu
19	Peru	Space Weather Program in Peru: Preliminary Results	Jean-Pierre Raulin
20	Philippines	Space Weather Activities in the Philippines (2007-2017)	Clint Bennett
21	Slovakia	Space weather research in Slovakia and related ISWI activities in the last decade	Ivan Dorotovic
22	Spain	Space weather activities in Spain	Consuelo Cid
23	Thailand	Space Weather Activities in Thailand: Research on Effects of Solar Energetic Particles and Solar Wind	S. Aukkaravittayapun
24	Tunisia	AWESOME and SuperSID space weather monitoring instruments: Outreach and research activities developed	Ahmed Ammar
25	Ukraine	Operational Space Weather Services in Ukraine	Aleksei Parnowski
26	USA	USA-sponsored Space Instruments Deployed under the ISWI Umbrella	E. Yizengaw and D. Webb

Science Posters			
Poster #	**Country**	**Title**	**Presenter**
26	USA	On the Magnetic Connection between Solar Active Regions and Interplanetary Coronal Mass Ejections	Sanchita Pal
27	USA	Halo Coronal Mass Ejections and Type II Radio Bursts during the two peaks of Solar Cycle 24	Ashna Vellarampara Malayil
28	Mexico	Interplanetary scintillation observations at 140MHz toward near real-time monitoring of solar wind properties	Ernesto Aguilar-Rodrigues
29	Switzerland	The e-CALLISTO Network	Christian Monstein
30	Sri Lanka	Type II Solar Radio Bursts detected by CALLISTO at ACCIMT	S. Gunasekera
31	Rwanda	Chracterization of CMEs from Associated Solar Radio Bursts detected with CALLISTO Spectrometers	Jean Uwamahoro
32	Armenia	Worldwide network of particle detectors SEVAN: 10 years of operation	Valery Babayan
33	Uganda	Statistical Analysis of the Correlation between equatorial electrojet and the occurrence of Equatorial Ionisation Anomaly over the East African	Patrick Mungufeni
34	Croatia	A comparative study of forecasting methods for space weather-caused GNSS positioning performance deterioration	Mia Filic
35	USA	Synergic Combination of Ionosonde Data and GNSS-based TEC data for Monitoring Ionospheric Disturbances and	Rezy Pradipta
36	USA	ULF Waves in the Ionospheric Alfven Resonator: Observations and Simulations	Beket Tulegenov
37	USA	The Low-Latitude Ionospheric Electrodynamics and its Importance in Space Weather Prediction	Sovit Khadka
38	USA	In-situ and ground-based observations of equatorial ionospheric irregularities and implications for Spread F	Dev Joshi
39	Cameroon	The first results on Sq Solar Variation at Yaounde-Cameroon AMBER Station	Messenga Etoundi Honore
40	Republic of Con	Estimated impacts induced by the magnetic activity index (Dst) on Local Total Electron Content (TEC) in the Equatorial area	Jean Bienvenu Dinga
41	Cote d'Ivoire	Geomagnetic induction effects related to impulsive space weather events at low latitudes	Doumbia Vafi
42	Brazil	On the temporal variation of Atmospheric electric field in South America	Jose Tacza
43	Georgia	On the development of thermosphere-ionophsere coupling study in Georgia under various helio-geophysical condition by TEC data obtained with GNSS	Goderdzi Didebulidze
44	Viet Nam	NAVINET: An Experimental Portal for Low-latitude Ionoshere Study in South East Asia	Ta Hai Tung
45	Pakistan	Particle-in-cell Modeling of CubeSat and Ionospheric Plasma Interaciton	Nadia Imtiaz
46	Italy	The Software Defined Radio Technology for GNSS Ionosphere Monitoring	Vincenzo Romano
47	Poland	Geant4 simulations of STIX instrument response to the solar particle events and cosmic rays	Marek Steslicki
48	USA	The SID Space Weather Monitors - Educational Instruments of the ISWI	Deborah Scherrer
49	Germany	The ISWI Instrument SOFIE	Daniela Wenzil