First International Workshop on Small Satellites for Space Weather Research & Forecasting

August 1 - 4, 2017 Washington, DC

Overview

The Small Satellites for Space Weather Research and Forecasting workshop is the first dedicated scientific meeting focusing on specific needs of space weather studies using smallsat platforms.

Detrimental space weather effects such as geomagnetic and ionospheric storms, elevated fluxes of charged particle radiation, and the atmospheric drag caused by enhanced solar activity present a growing hazard to human technologies and society. The quickly maturing miniaturized satellite technologies provide a unique opportunity for building versatile and cost-efficient geospace monitoring platforms allowing for rapid innovations, and are of special interest for space weather research and operations.

The workshop invites a broad scope of contributions related to the applications of small satellites to space weather observations, research, analyses, forecasting, and operations, including those utilizing the CubeSat reference design.

The overarching goal of the workshop is to identify target scientific questions, geospace domains, and space weather conditions for which small satellites have a decisive advantage over traditional space weather monitoring platforms.

We will also seek to determine major scientific, engineering, and programmatic challenges in developing dedicated small satellite space weather missions of the future, and to explore the unique training opportunities smallsat-based space weather research & forecasting can offer to academic institutions. Limited funding will be made available for student participation.

Meeting venue

The workshop will be held at the Catholic University of America (CUA), in proximity to NASA Goddard Space Flight Center providing opportunities of on-site discussions and tours.

Organizing committee (as of 11/10/2016)

Silvina Guidoni	NASA/Goddard
Larry Kepko	NASA/ Goddard
Yoshi Miyoshi	Nagoya University, Japan
Teresa Nieves-Chinchilla	CUA
Antti Pulkkinen	NASA/ Goddard
Robert Robinson (Co-Chair)	CUA
Doug Rowland	NASA/ Goddard
James Spann	NASA/Marshall
Vadim Uritsky (Chair)	CUA

Topics of interest

- Observations of magnetospheric and ionospheric current systems representing extreme geomagnetic conditions; small satellite observations of interplanetary and solar phenomena;
- Investigations of space weather effects on small satellites: degraded capabilities, situational awareness, and increased risk satellite-debris collisions;
- Using small satellite data in global space weather simulation and forecasting frameworks;
- Small satellites in support of space weather studies for the upcoming missions beyond the Earth geosynchronous orbit;
- General contributions relevant to small satellite investigations of space weather effects.

Tentative schedule of sessions

Day 1: Mission Concepts (Tuesday, August 01 2017)

Session 1. Past and ongoing small satellite missions relevant to space weather research and applications: Lessons learned.

Session 2. Next generation small satellite missions for observations and monitoring of space weather phenomena.

Day 2: Research and Forecasting (Wednesday, August 02 2017)

Session 3. Observations and understanding of specific space weather conditions (solar & interplanetary phenomena, geospace currents and fields, energetic particles, etc.) that can be investigated using small satellites.

Session 4. Integration of small satellite - based information into general space weather modeling and forecasting infrastructure.

Day 3: Innovations and Technology (Thursday, August 03 2017)

Session 5. Space weather instrumentation for small satellite platforms. Observational requirements and operational challenges. Ground systems for data acquisition.

Session 6. Small-satellite subsystems (propulsion, ACS, communications, power, others) necessary for the study of extreme space weather conditions.

Day 4: Future Opportunities (Friday, August 04 2017)

Session 7. Educational opportunities, outreach, interdisciplinary collaboration.

Session 8. Programmatic considerations: panel discussion with representatives from NASA, NOAA, NSF & Air Force funding programs.

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