



# SSERVI Monthly Report

## NESS/PI Burns - September, 2017



### Progress Report

- **New Research:** Mebane, Mirocha and Furlanetto (UCLA) are building a physically motivated framework to describe the first generations of stars, prime targets for a lunar low-frequency radio observatory.
- **Papers:** L. Ma, T. Fong, M. Micire, Y. Kim & K. Feigh, 2017, "Human-robot teaming: concepts and components for design", Proceedings Conference Field and Service Robotics; B. Mellinkoff, M. Spydell, W. Bailey & J. Burns, "Quantifying Operational constraints of Low-Latency Telerobotics for Planetary Surface Operations", 2018 IEEE Aerospace Conference Proceedings, submitted; R. Mebane, J. Mirocha & S. Furlanetto, "The Persistence of Population III Star Formation", in preparation.
- **Presentations:** Cichan presented "Mars Base Camp Updates and New Concepts", IAC-17, A5, 2,7, x40817, and Coderre presented "International, Scientific, and Commercial Opportunities Enabled by the Deep Space Gateway", IAC-17- A5.1.5, both at the 68th International Astronautical Congress in Adelaide, Australia, between Sept 25-29; Rapetti presented a talk "Constraining Cosmic Dawn with Global 21-cm Signal Observations from the Lunar Farside" at COSMO-17 in Paris, France, on Aug 29; Fong presented a keynote talk "Human-Robot Teaming" at the Field & Service Robotics conference in Zurich, Switzerland, on Sept 15; Fong also presented another keynote talk "From the Moon to the Earth" at the 2017 RoboBusiness conference in Santa Clara, CA, on Sept 27.
- **Student Mentoring:** Rapetti and Tauscher mentored University of Chicago summer undergraduate student Eid in a project to code a drift scan for an analysis pipeline being developed to extract the 21-cm signal of neutral hydrogen during Cosmic Dawn; Monsalve mentored CU summer undergraduate student Ritchie in a project to understand through simulations the properties of antenna beams that could lead to significant spectral corruption in 21-cm measurements; Graduate student Mahesh started research with Bowman on a prototype for a low-frequency lunar array concept.

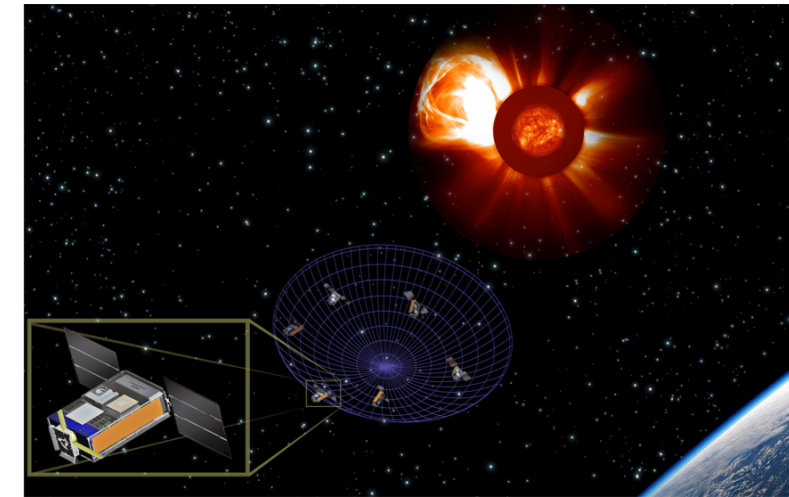
### Upcoming Events

- MacDowall and Kasper will attend the Parker Solar Probe/Solar Orbiter SWG (JHU APL) on Oct 2-6.
- MacDowall will present on low frequency radio arrays from the lunar surface at LEAG (Columbia, MD) on Oct 10-12, and then attend the *Back to the Moon* workshop on Oct 12-13 in Columbia, MD; MacDowall will also attend the Van Allen Probes SWG (JHU APL) on Oct 25-27 (data from Probes will be used to determine the feasibility of synchrotron emission imaging of Earth's magnetosphere from the near-side of the Moon, as well as attempt to find a way to distribute a pathfinder antenna array to obtain adequate angular resolution images).
- Bowman will present results from EDGES at IAU333, "Peering Toward Cosmic Dawn", on Oct 2.

### Moment of Science

#### SunRISE Mission

# of cubesats: 6  
 Size: 6U form factor  
 (i.e. 10x20x30 cm)  
 Orbit: GEO+  
 Frequencies: 0.1-25 MHz  
 Time resolution: 0.1s  
 Launch: July 2022



The Sun Radio Interferometer Space Experiment (SunRISE) was recently selected for a Phase A study as a Heliophysics Explorer Mission of Opportunity. Consisting of six small spacecraft spread over 10 km slightly above geosynchronous orbit, SunRISE will image bright solar radio bursts to track the origin and transport of solar energetic particles. NESS Co-I Kasper is the PI of SunRISE.