



SSERVI August Progress Report

NESS/PI Burns



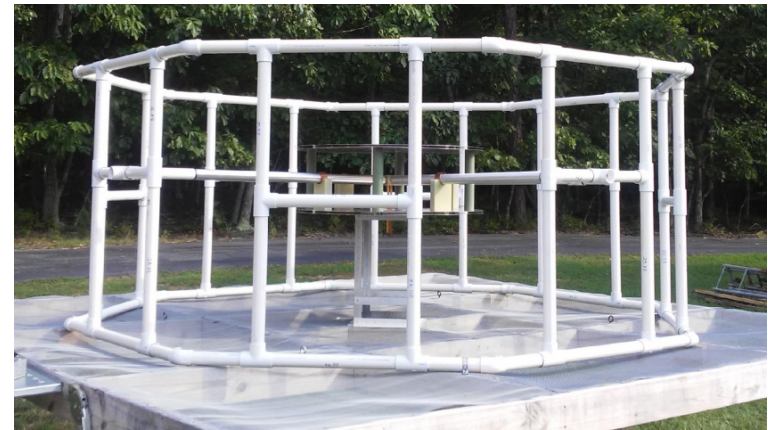
Progress Report

- Mirocha and Furlanetto are exploring unique signatures from the first generations of stars in the Universe that could be observable from a lunar low-frequency radio observatory.
- MacDowall & Kasper are establishing design constraints for a low-frequency heliophysics radio array on the lunar surface.
- **Papers:** Burns et al. (2017), ApJ 844, 33; Burns et al. (2017), IAA conference proceedings, arXiv:1705.09692 (co-author D. Kring from CLSE SSERVI team); Mellinkoff et al. (2017), arXiv:1706.03752; Monsalve et al. (2017), accepted to ApJ, arXiv:1708.05817; Mirocha et al. (2017), submitted to MNRAS.
- NESS website has gone live: <http://www.colorado.edu/ness/>.
- NESS Steering Committee kick-off meeting was held on May 25, 2017 in Boulder followed by a 2nd meeting at ARC on July 19.
- **Presentations:** Burns presented invited plenary talk on *Surface Telerobotics* at conference on Bridging the Gap in Space Robotics at MIT on July 15, invited talk to IAA Symposium on *Science & Exploration at the Moon & Mars Enabled by Surface Telerobotics* in Torino, Italy on June 28, and invited talk on *Low Frequency Radio Astronomy from Space* at the Kavli U.S. Radio Futures III conference at UC Berkeley on Aug. 3. Bowman also presented invited talk at the Radio Futures conference on status of global 21-cm experiments. Monsalve delivered a seminar at UC Berkeley on July 17 on 21-cm cosmology measurements, and an invited talk to U. Richmond on July 21.
- At **NASA Exploration Science Forum**, July 18-20, NESS members presented 15 talks & posters. Burns gave the Forum closing talk on *The Elusive Why of Space Exploration*.
- Burns participated in LEAG *Advances in Science of the Moon Special Action Team* meeting on August 7-8 at LPI. Goals were to assess & update the 2007 NRC SCEM report.

Upcoming Events

- Rapetti will present a talk in COSMO17 at the University Paris Diderot campus about a novel data analysis pipeline for a radio antenna in lunar orbit that efficiently separates the global 21-cm signal from foreground and instrument systematics on Aug 31.
- Burns is a member of the working group, led by Ben Bussey, on *Science with the Deep Space Gateway (DSG)*. We are proposing concepts for instruments on the DSG and are organizing a community workshop for early 2018. Our proposed instruments include a low frequency radio cosmology telescope, enhanced telecom to the lunar surface, and power beaming to the surface.

A Moment of Science



Assembly of the *Cosmic Twilight Polarimeter*, a prototype for a future instrument to observe the 21-cm global cosmology signal from the first stars & galaxies to be placed in lunar orbit. This instrument is part of Colorado grad student Bang Nhan Ph.D. dissertation project, supervised by NESS Co-I Bradley (NRAO) and Burns.