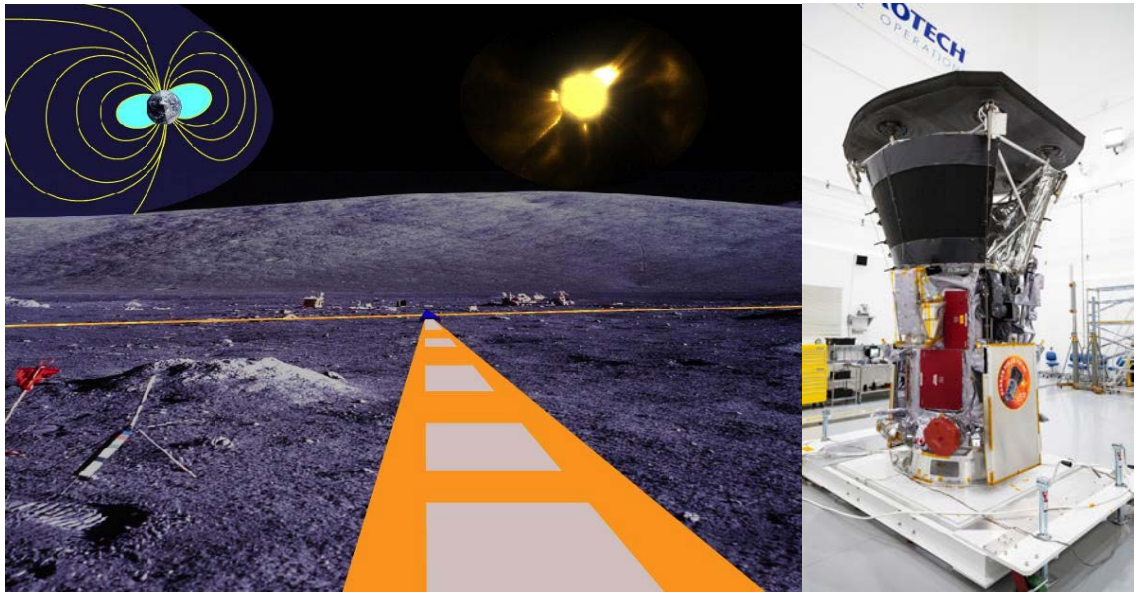
SSERVI Monthly Report
NESS/PI Burns - August, 2018

Progress Report

- **Research highlights:** At UCLA, **Furlanetto**, **Mirocha**, and undergraduate researcher Kristy Fu explored how globular clusters may have impacted the spin-flip background targeted by lunar radio telescopes.
- **Papers: Monsalve**, Greig, **Bowman**, Mesinger, Rogers, Mozdzen, Kern, **Mahesh**, "Results from EDGES High-band. II. Constraints on Parameters of Early Galaxies", 2018, ApJ, 863, 11.
- **News/Media:** In connection with the successful launch of NASA's Parker Solar Probe on August 12, NESS Co-I **Kasper** was quoted in**:** (1) "NASA's Parker Solar Probe Is Headed to the Sun. So, What's Next?" by Meghan Gartels, space.com; (2) **"**Touching the Sun to protect the Earth, a Q&A with Justin Kasper on going where no probe has gone before" by Gabe Cherry for the Michigan Engineer News Center.
- **Talks: Burns** presented on "Transformative Science from the Moon: Astrophysics, Cosmology, & Heliophysics" to the NASA Advisory Council's (NAC) joint meeting of the Science and Human Exploration Operations Committees on August 28 at the NASA Ames Research Center (press summary from the NAC committees). **Monsalve** presented on: (1) "An Absorption Feature in the Sky-Averaged Radio Spectrum" at the Thermal History of the Universe at Intermediate Redshift Workshop, June 26, CERN, Geneva, Switzerland; (2) "Characterizing the Early Universe with the Sky-Averaged Radio Spectrum" at a Physics Seminar, June 29, University of Torino, Torino, Italy; (3) "Probing the First Galaxies and Black Holes with the Global Redshifted 21-cm Line" at The Early Growth of Supermassive Black Holes Workshop, July 6, Sesto, Italy; (4) "EDGES Measurement of an Absorption Feature in the Global Radio Spectrum" at the Tremendous Radio Arrays Workshop, July 30, Brookhaven National Lab, Upton, USA; (5) "An Absorption Signal in the Sky-Averaged Radio Spectrum" at the Rencontres du Vietnam: Windows on the Universe Conference, August 9, Quy Nhon, Vietnam; and (6) "Fingerprints of the First Stars in the Sky-Average Radio Spectrum" at the 2018 TeV Particle Astrophysics Conference, August 30, Berlin, Germany.
- **Meeting:** "Workshop on 21-cm systems" at MIT Haystack, Aug 23-24: **Bowman** presented on "EDGES results", **Bradley** presented on "Ground plane resonance", and **Monsalve** presented on "S11 measurements".

Moment of Science:



Caption: Following the successful launch of Parker Solar Probe (PSP; right panel) on August 12, PSP will be observing the solar wind and other parameters between 10 and 20 solar radii during the next 6 years. The PSP FIELDS radio astronomy instrument and the WISPR wide-field optical imager will provide remote measurements of the extended environment around the spacecraft. Radio imaging of solar radio bursts from 1 AU in the frequency range 1 - 10 MHz, by a lunar surface radio astronomy array (left panel) or a CubeSat array, would enhance the knowledge of (1) potential weaker bursts currently not being detected at 1 AU due to the intensity of the sky, but visible by PSP close to the Sun, and which an aperture synthesis array on the Moon would see with a higher rate than we presently predict; and (2) the PSP large-scale environment, especially later in the mission, as solar maximum gets closer with more solar radio bursts per day. The NESS team is working on both of these radio imaging capabilities. NESS team members who are part of the PSP team include: **Kasper** is PI of the Solar Wind Electrons Alphas and Protons (SWEAP) instrument; **MacDowall** is the fluxgate magnetometer lead for the 2 MAGs that are part of the FIELDS instrument suite.

8/29/2018