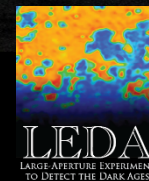


The Owens Valley LWA

Gregg Hallinan: Caltech



Concept

352 antennas spaced over ~2.6 km

Full cross-correlation = All-sky FOV

25-85 MHz (2400 channels)

5 arcminute resolution

50 times survey speed of LOFAR-LBA!



Stage 1: 2013-2014

Custom built array for all-sky imaging

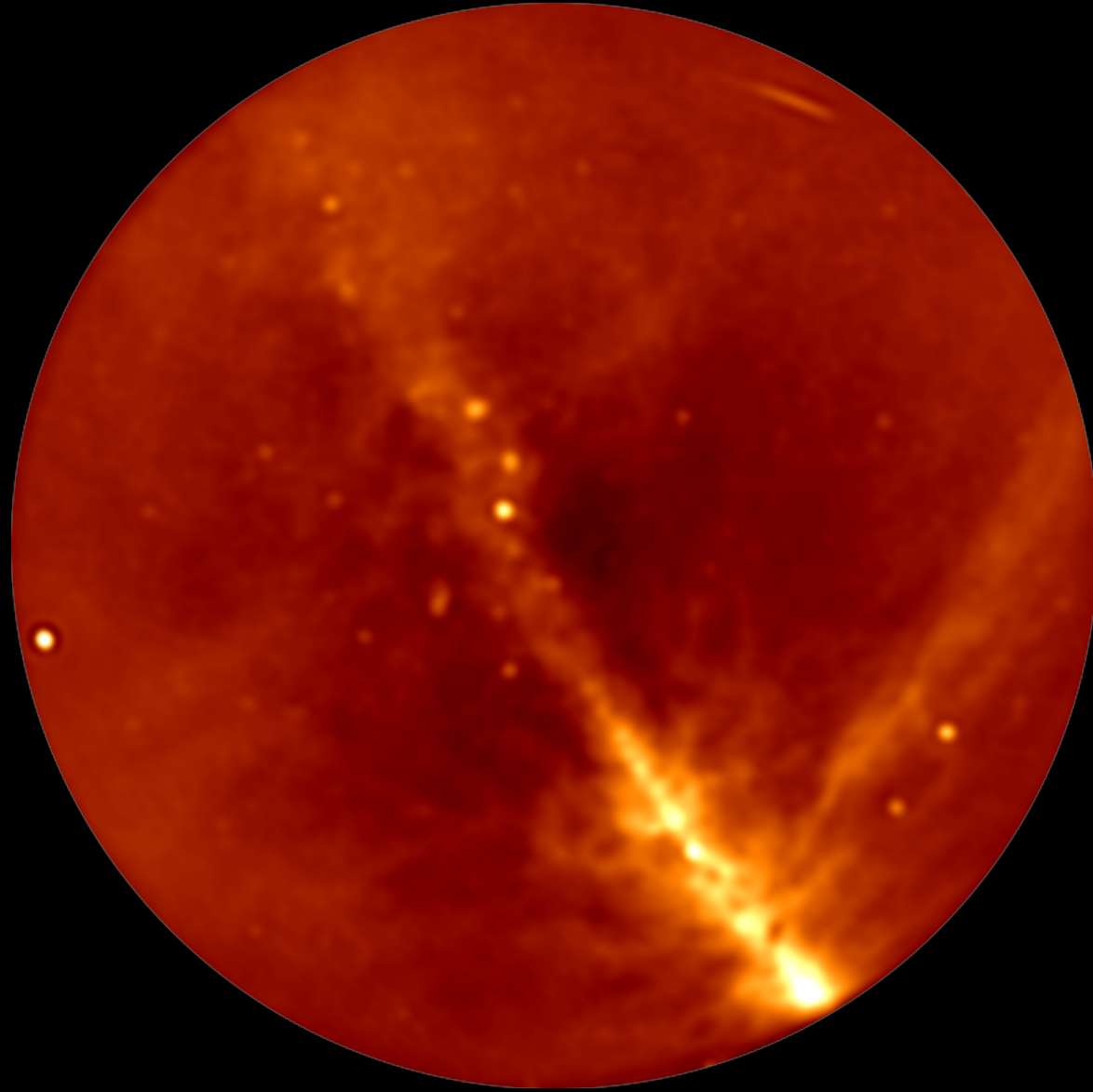
256 antennas
88 km of buried coaxial cable
1 km of fencing

200m




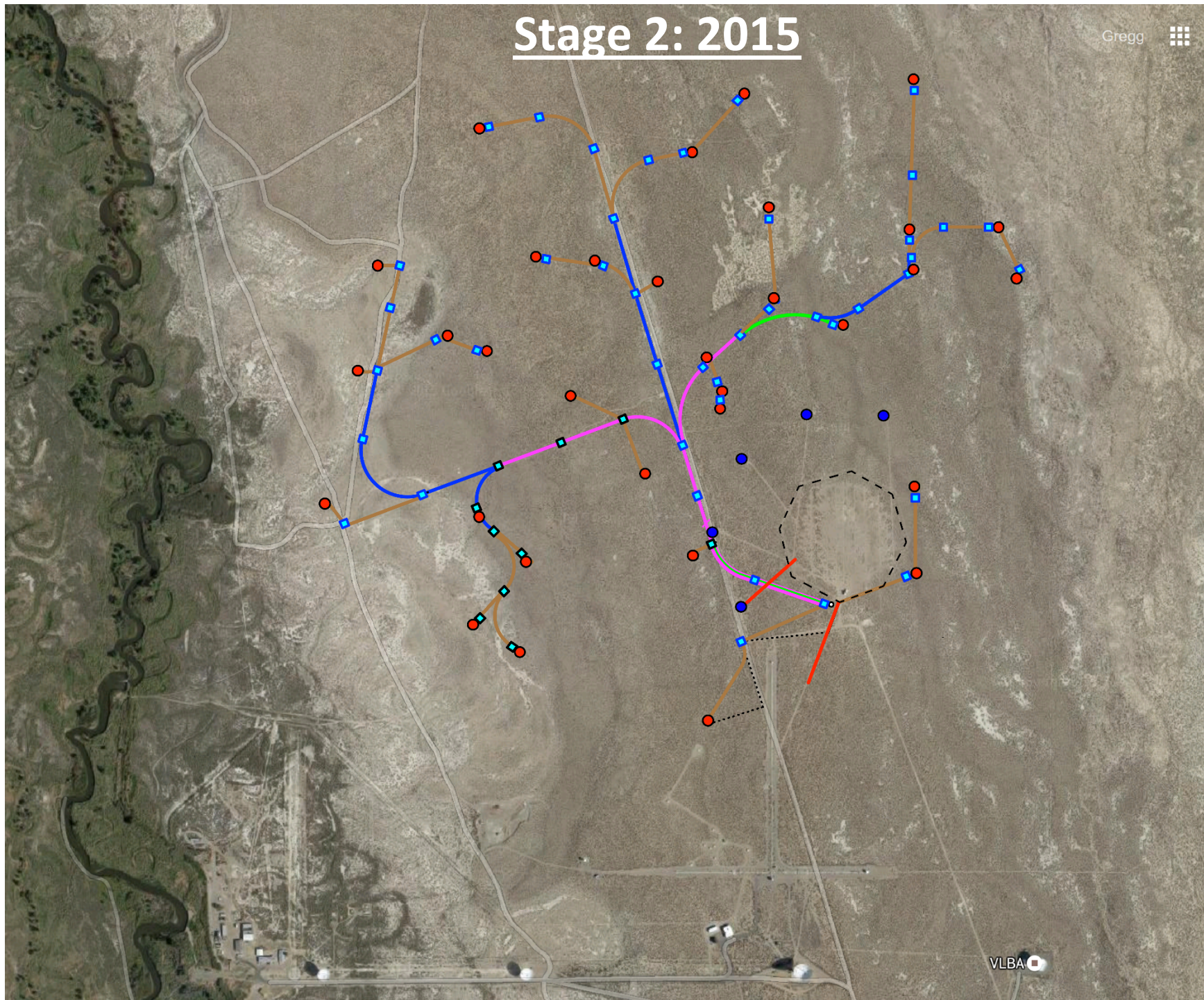
Two powerful back-ends:
1) LEDA correlator
2) All-sky Transient Monitor

Core Image (200m baselines)

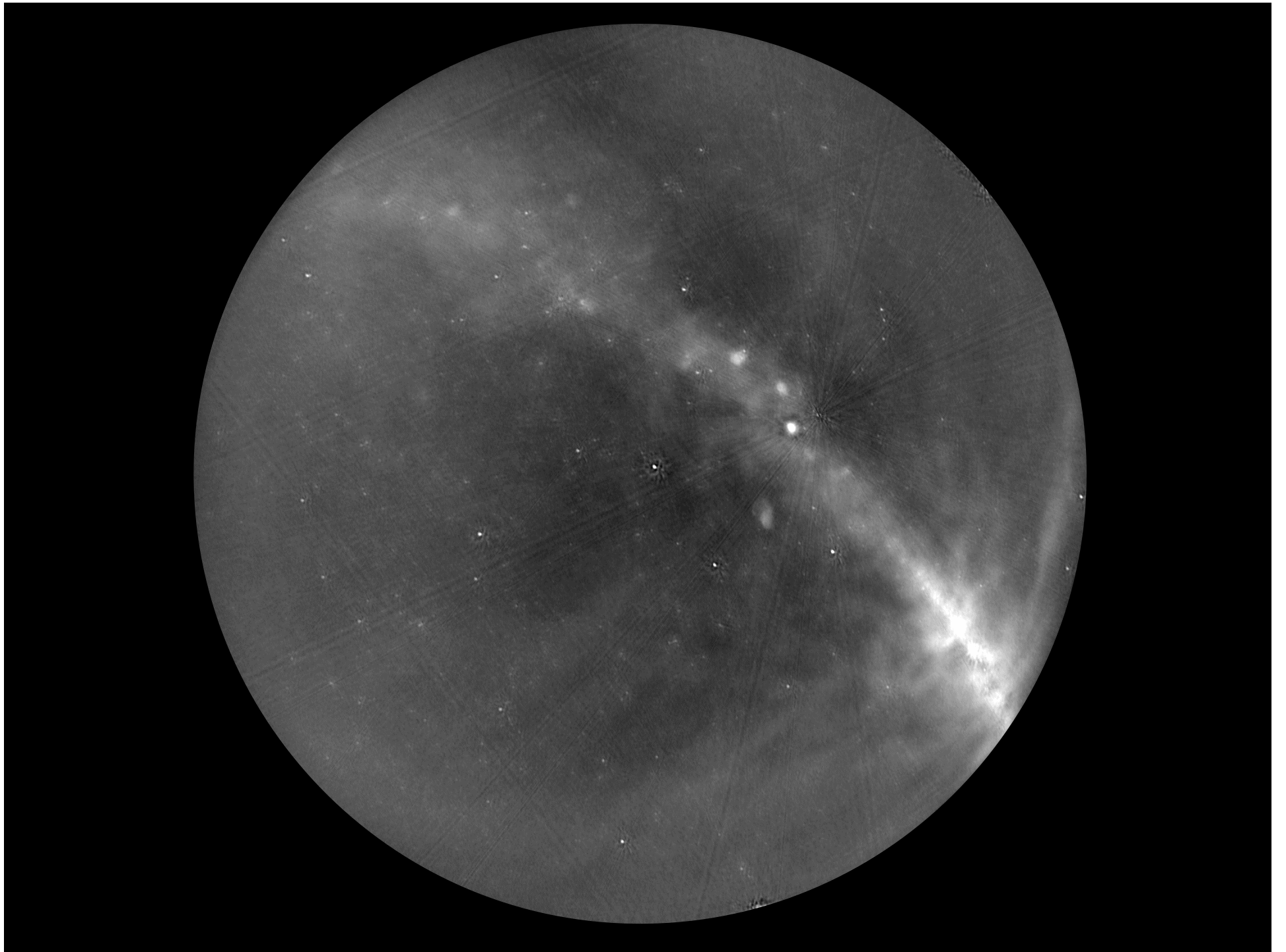


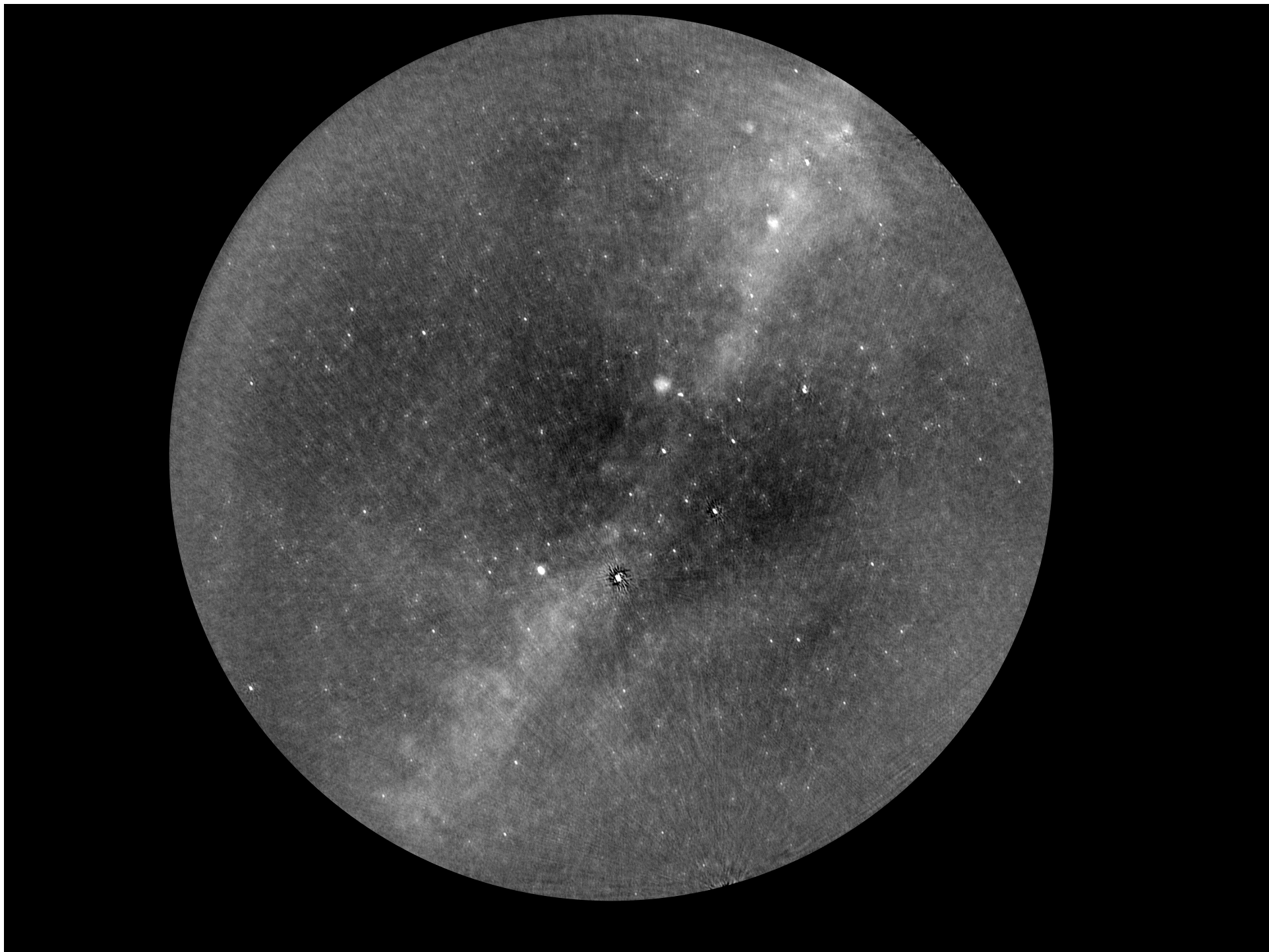
Stage 2: 2015

Gregg 











30 degrees

Science with All-sky

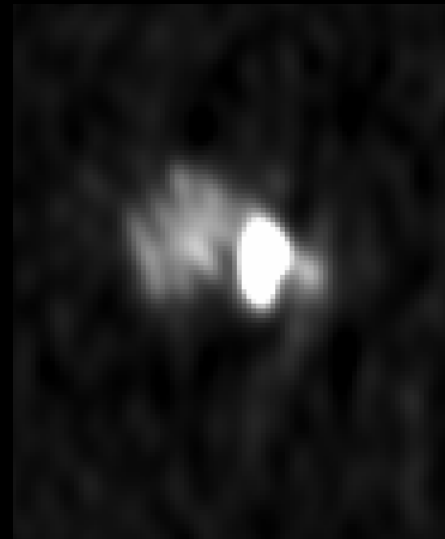
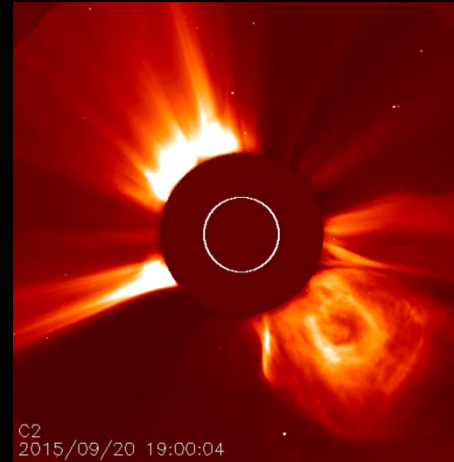
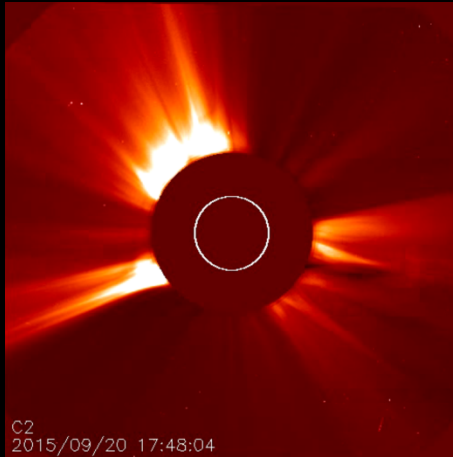
Transients

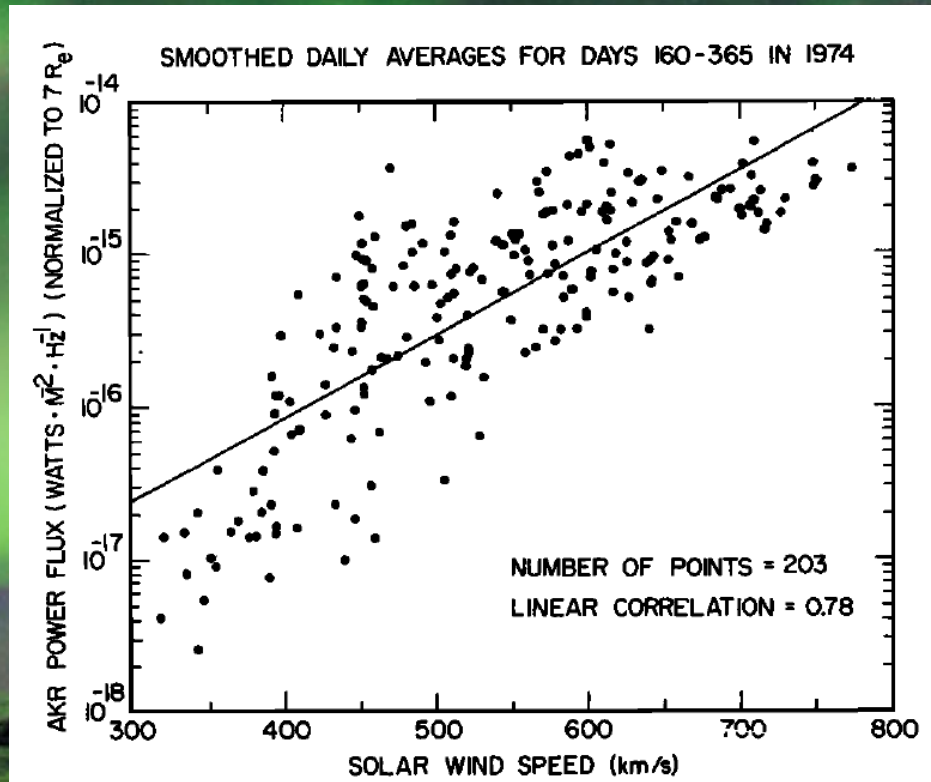
Cosmic Dawn

Solar Monitoring

**Ionospheric
Monitoring**

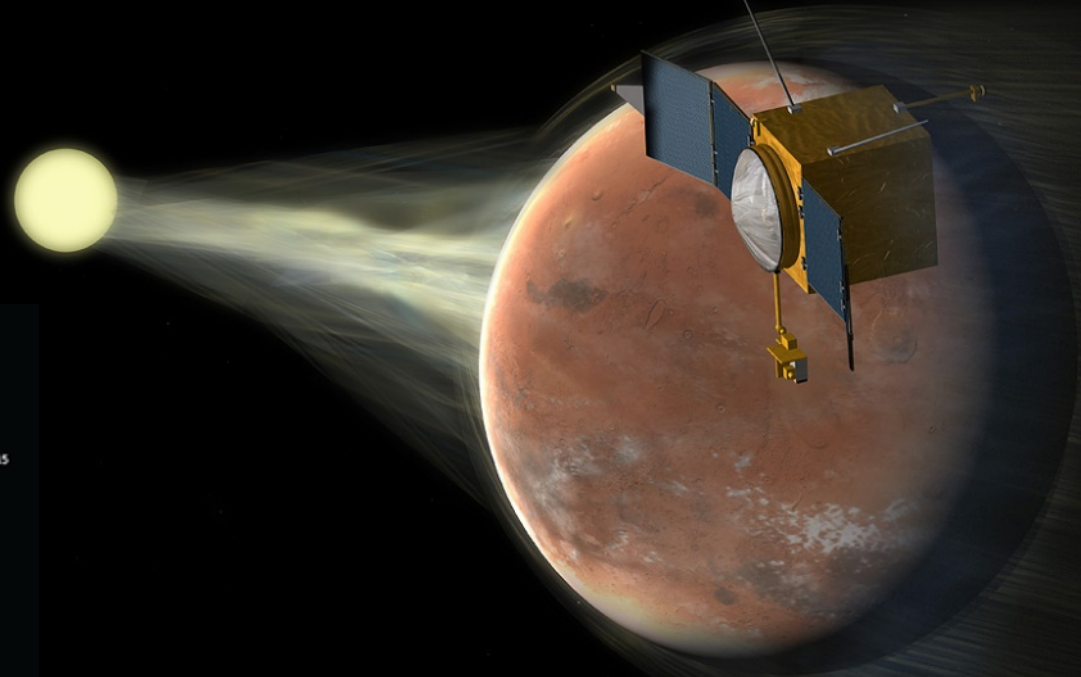
Solar Coronal Mass Ejection





Gallagher & D'Angelo 1981

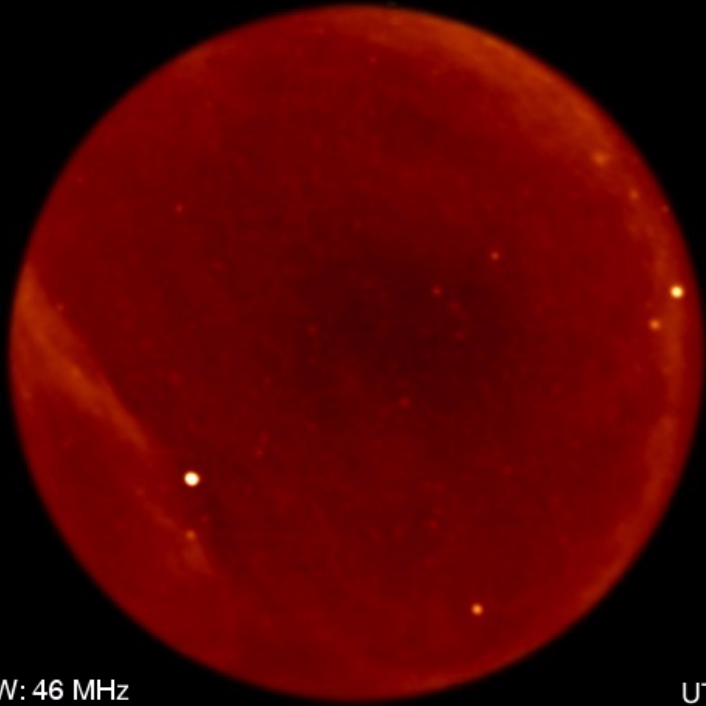
The Early Solar System



Extrasolar Space Weather



**How important is magnetic activity for defining habitability?
Can we directly detect stellar flares, CMEs, planetary aurorae?**



BW: 46 MHz
Freq: 35-81 MHz

UTC
2015-03-29 06:04

- OVRO-LWA: 288 antennas spanning 1.6 km
- Traces CME and planetary auroral emission

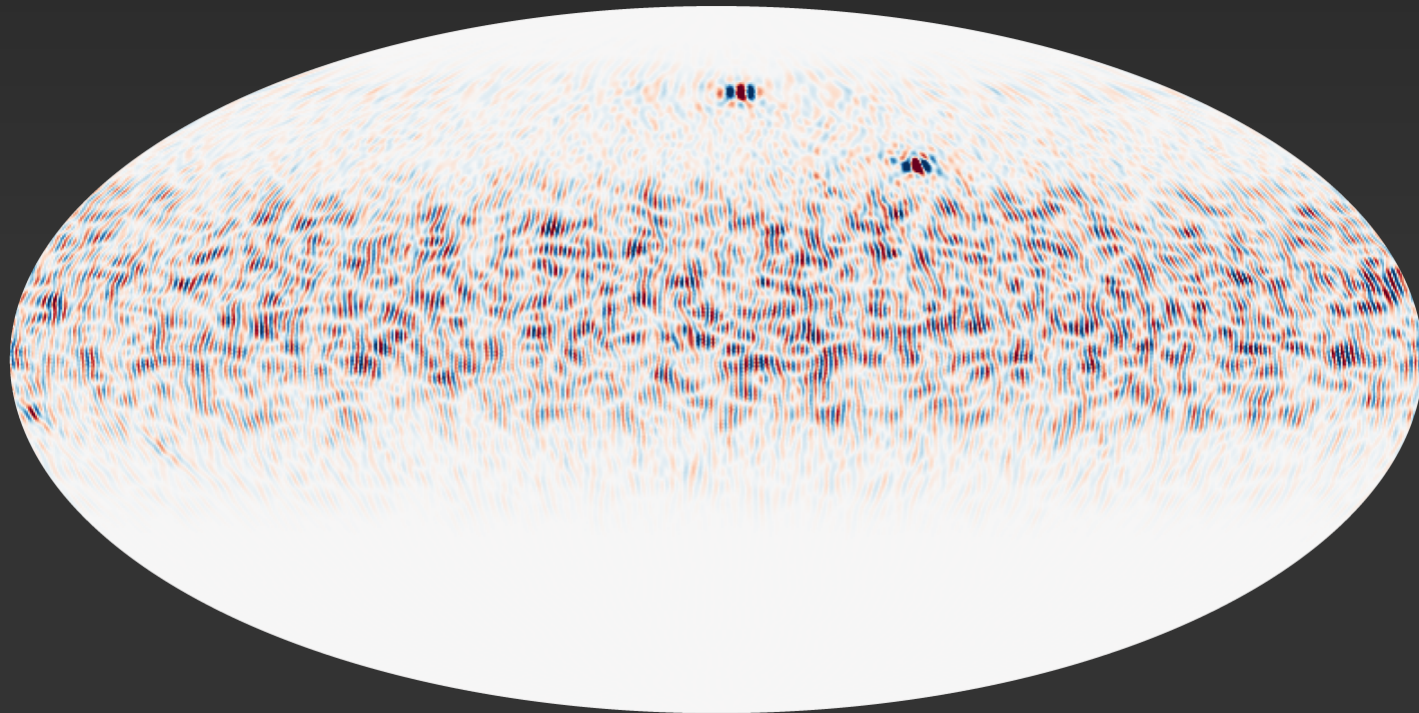


- Evryscope: twenty-four 61 mm-aperture telescopes [PI: Nick Law]
- 2-minute cadence multi-year light curves for every star brighter than Sloan $g = 16.5$
- traces stellar flare emission

-Both telescopes will continuously monitor a volume limited
-sample of 2000 stars out to 25 pc

Cosmic Dawn ($z \sim 15-30$)

M-mode analysis – Shaw et al. 2014, 2015



$$\nu \approx 45 \text{ MHz}, \quad B = 24 \text{ kHz}, \quad \tau \approx 12 \text{ hr}$$

Eastwood et al. (2016, in prep.)

Summary and Status

- **288-antenna Owens Valley LWA is complete**
- **Produces all-sky images every 9 seconds with ~10 arcminute resolution**
 - **Remaining 64 antennas proposed via NSF ATI in 2015**
 - **10-day survey with core array completed in July 2015**
 - **3-day survey with full array completed in September 2015**
 - **Instrument paper and early science coming in early 2016!**
 - **Continuous observations commence in early 2016**