### Objective 1:
- Determine the level of disagreement with the standard cosmological model caused by dark matter in the Dark Ages.

### Objective 2:
- Determine the level of excess cooling above the adiabatic limit for Cosmic Dawn.
- Determine when the first stars and black holes formed.

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**Will the observed behavior of redshifted neutral hydrogen redefine the standard cosmological model?**

**Legend:**
- Dark Ages DAPPER measurement
- Cosmic Dawn DAPPER measurements
- Edges Results
- Potential Model: Low Cooling
- Potential Model: Medium Cooling
- Potential Model: High Cooling
- Standard Model

**DAPPER** uses the 21-cm all-sky signal to observe redshifts $z = 83-12$, associated with the Dark Ages and the Cosmic Dawn.

**Mission Concept**

The Moon shields DAPPER from Earth's RFI noise.

Orthogonal antennas capture emissions of redshifted hydrogen; spinning allows polarimetry.

**Antennas deploy at 3 lengths to tune to frequencies from the time of Dark Ages and Cosmic Dawn:**
- 7.57 m, 3457 hr, 17.0-21.9 MHz
- 5.82 m, 926 hr, 21.0-28.7 MHz
- 4.41 m, 231 hr, 28.7-38.2 MHz

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**DAPPER** is designed for deep space and will carry DAPPER to its 50x125 km orbit of the Moon.