# EARTH AS AN EXTRASOLAR PLANET: SOUTH POLE ADVANTAGES

Wesley A. Traub, Antony A. Stark,
& Kenneth W. Jucks

Harvard-Smithsonian Center for Astrophysics

Steven Kilston

Ball Aerospace

Edwin L. Turner

Princeton University

Sara Seager

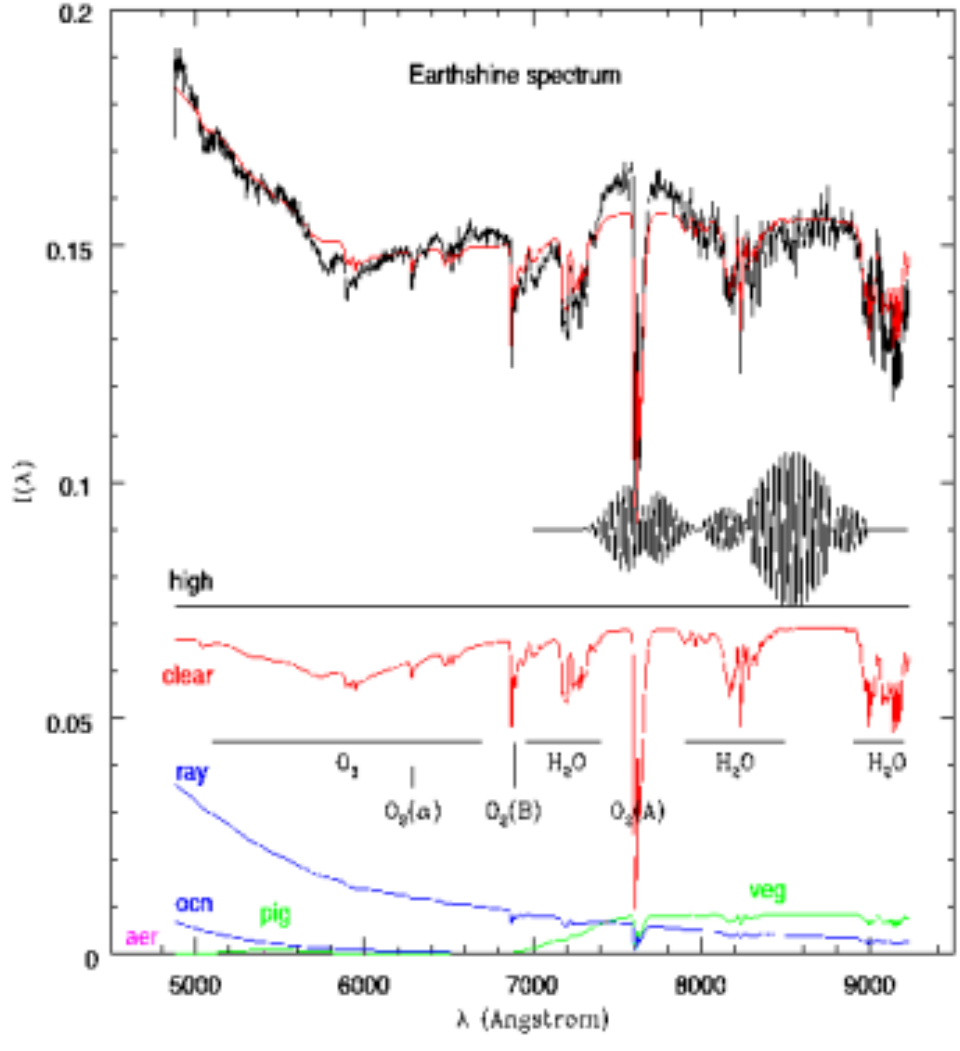
Carnegie Institution

The Poles are the only places on the Earth where Earthshine on the Moon can be monitored for an extended period while the Earth rotates.

Such observations are of interest as a template for the time variability of the spectra of extrasolar planets.

# Earthshine Spectrum

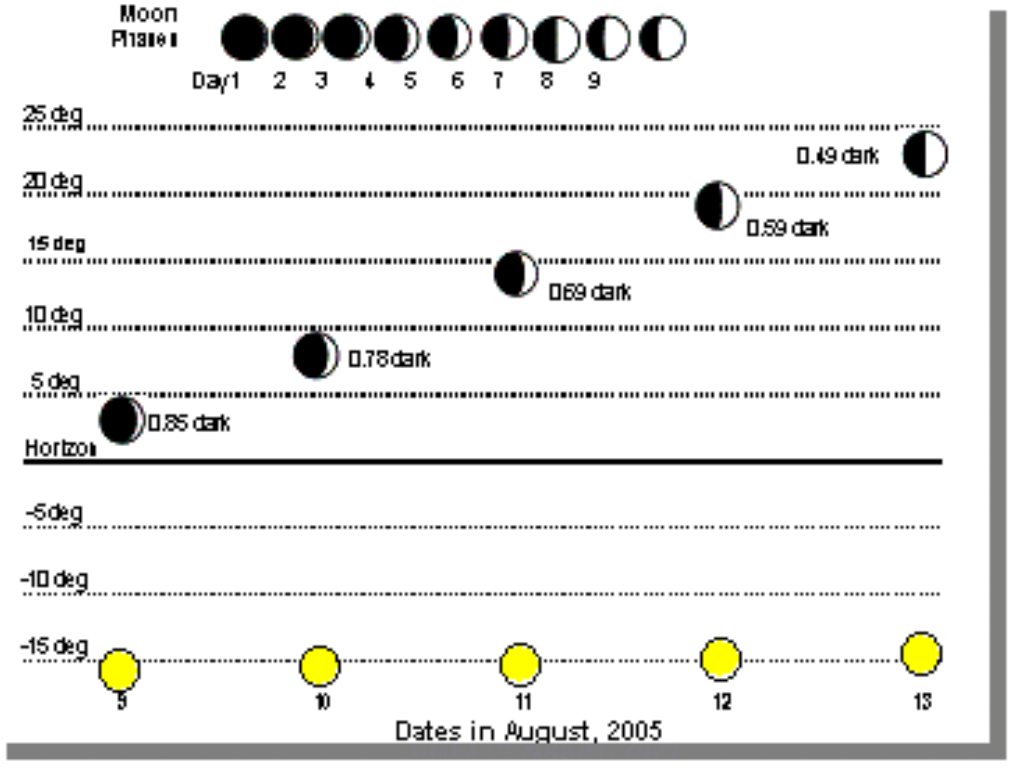
- We propose to use a small telescope at the South Pole to observe the dark side of the Moon.
- The data will be analyzed as if the target were an extrasolar planet.
- **We will search for $H_2O$, $O_2$, $O_3$, chlorophyll, air column density, clouds, continents, oceans, weather variations, and rotation period.**
- The observations will validate analysis methods for the Terrestrial Planet Finder coronagraph.



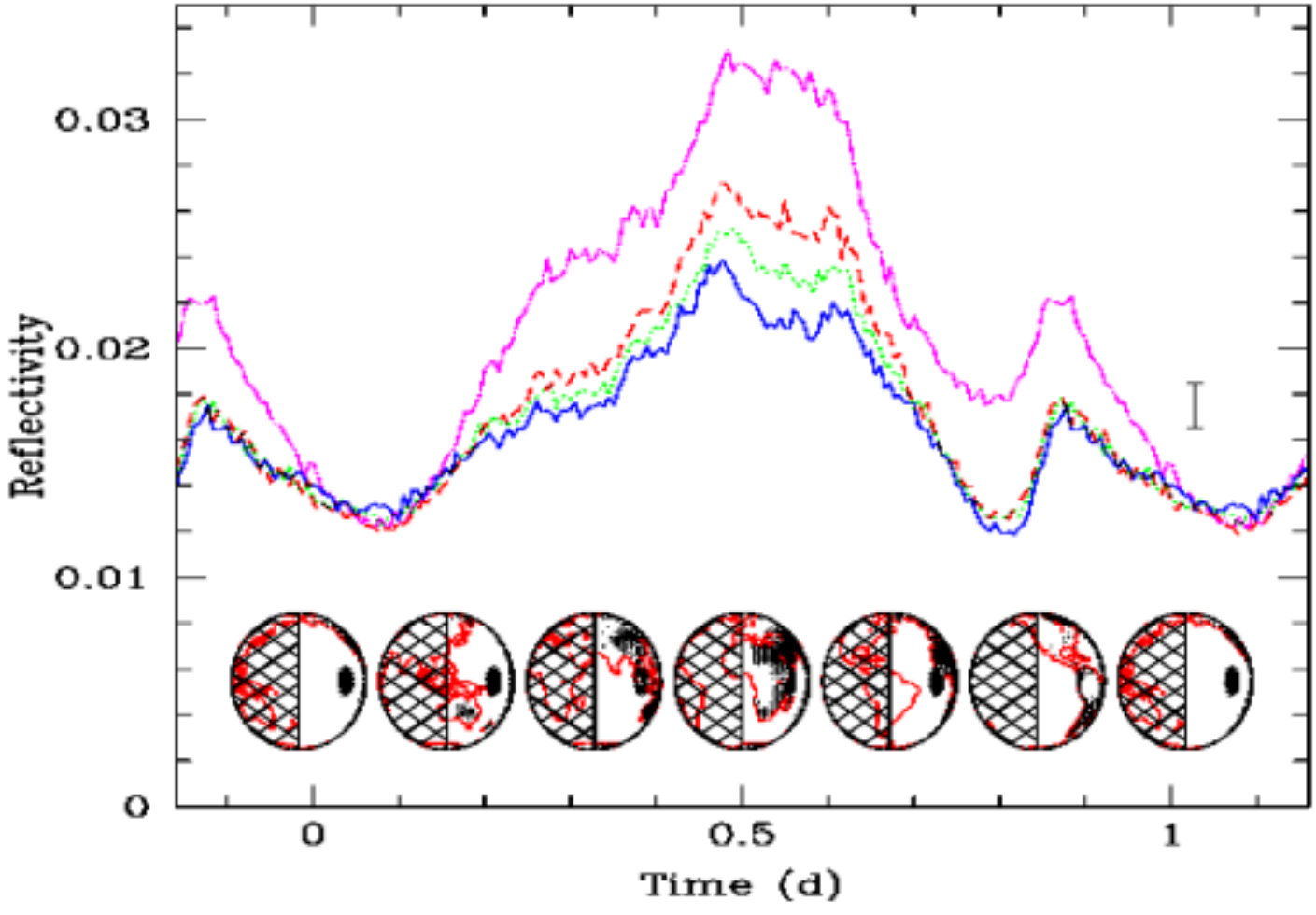
# Observing Window

For four months a year (April, May, August, September),

Earthshine can be observed for periods > 48 hours.



# Model UVRI reflectivities for 1 day



# Model of visible reflectivity over a 6 day period, based on satellite data