The ultraviolet reflectance of the Moon as measured by Cassini UVIS

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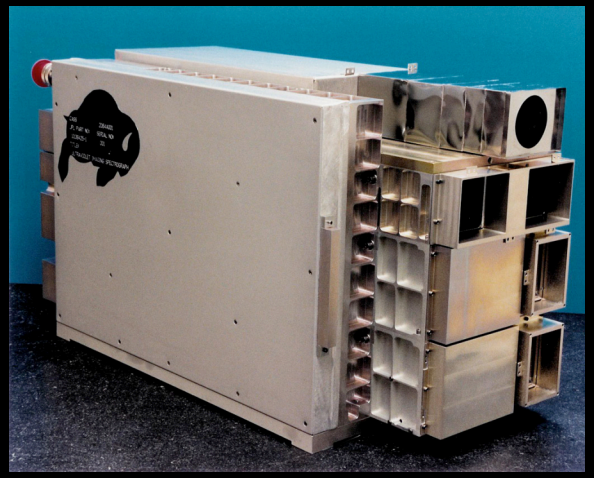
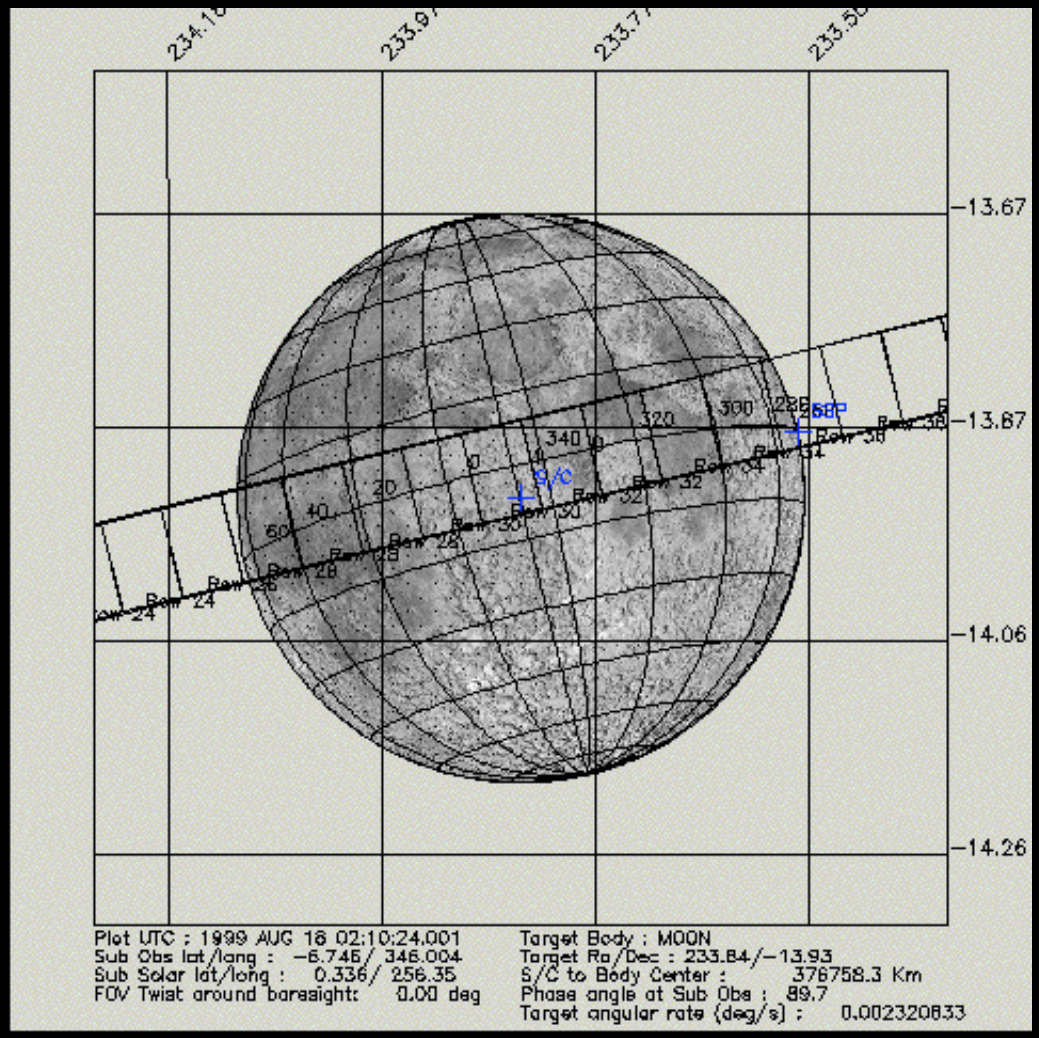
Cassini UltraViolet Imaging Spectrograph (UVIS)

- 64 spatial pixels (rows)
  - Low-resolution slit (1 mr x 1.5 mr)
- FUV (1115-1912 Å)
- EUV (563-1182 Å)



Observation Geometry



August 18 1999
$\alpha \sim 90°$

This observation will:

- help us get a better handle on UV reflectance of Moon (often used for calibration)

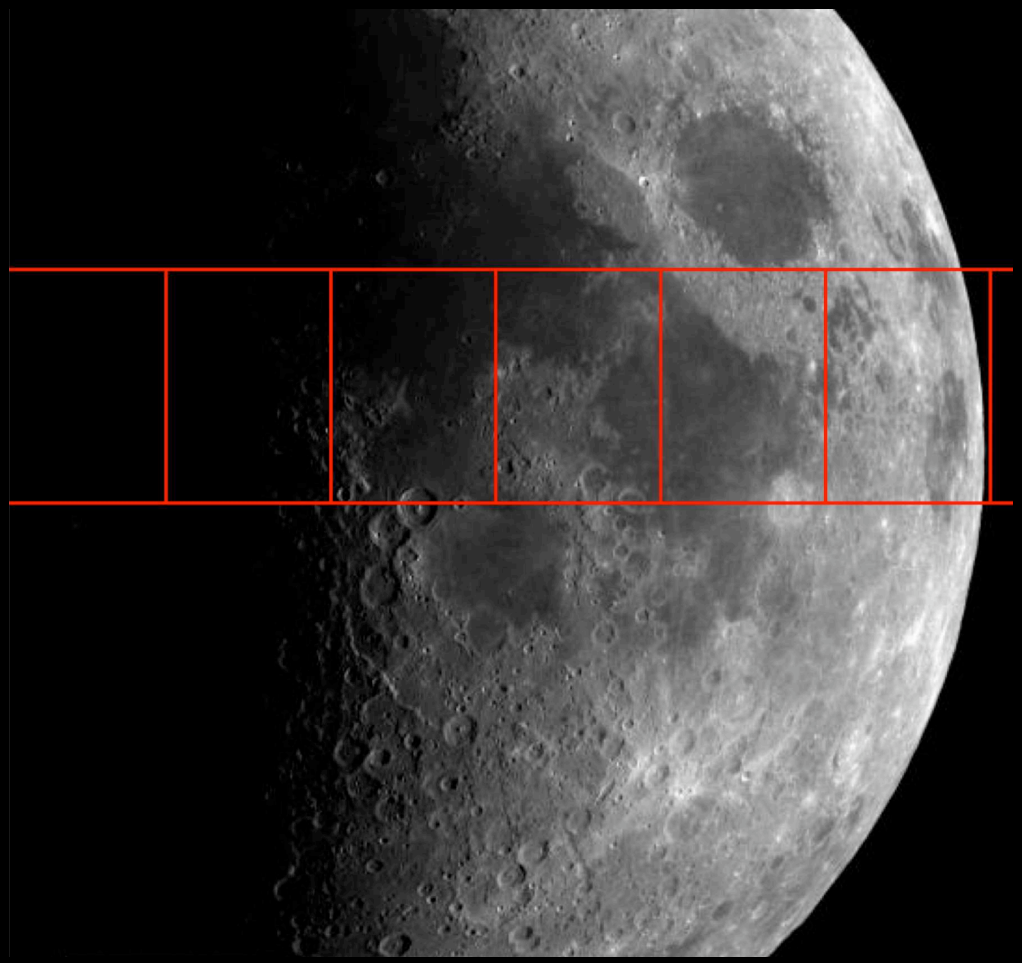
- enable future comparisons with LRO/LAMP results

- eventually help in investigating space weathering effects

Observation Geometry

August 18 1999
α~90°

Observation Geometry

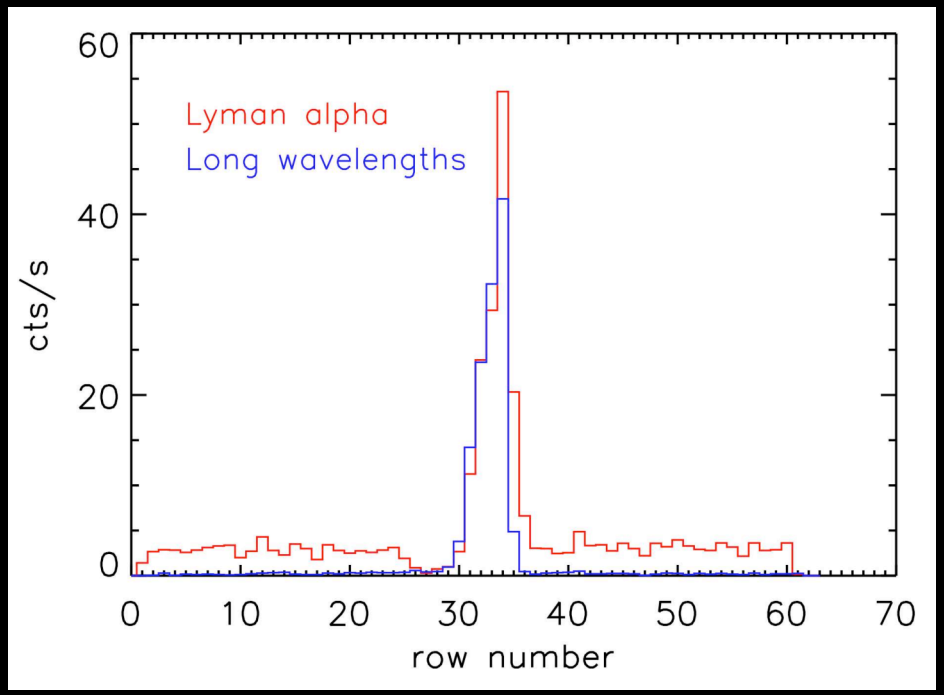


August 18 1999
α~90°

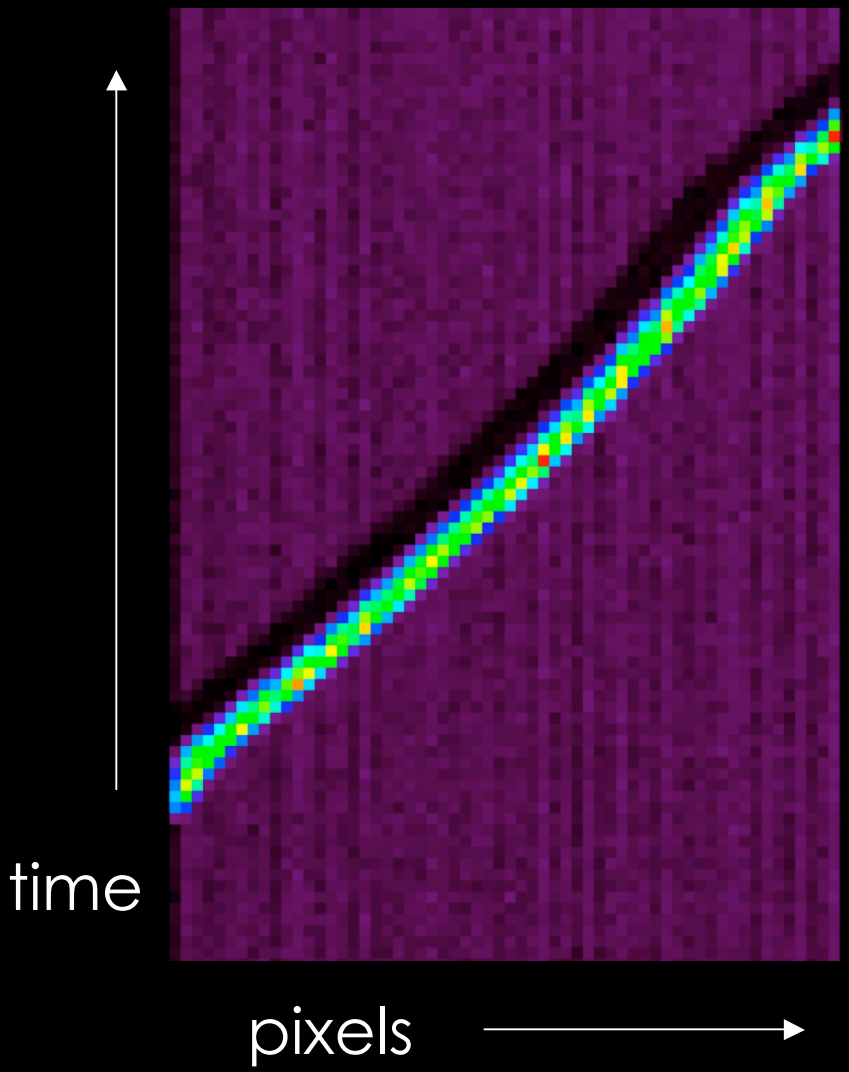
4-5 rows on illuminated side at any time

We average data from ~3 rows during the observation to get an average albedo

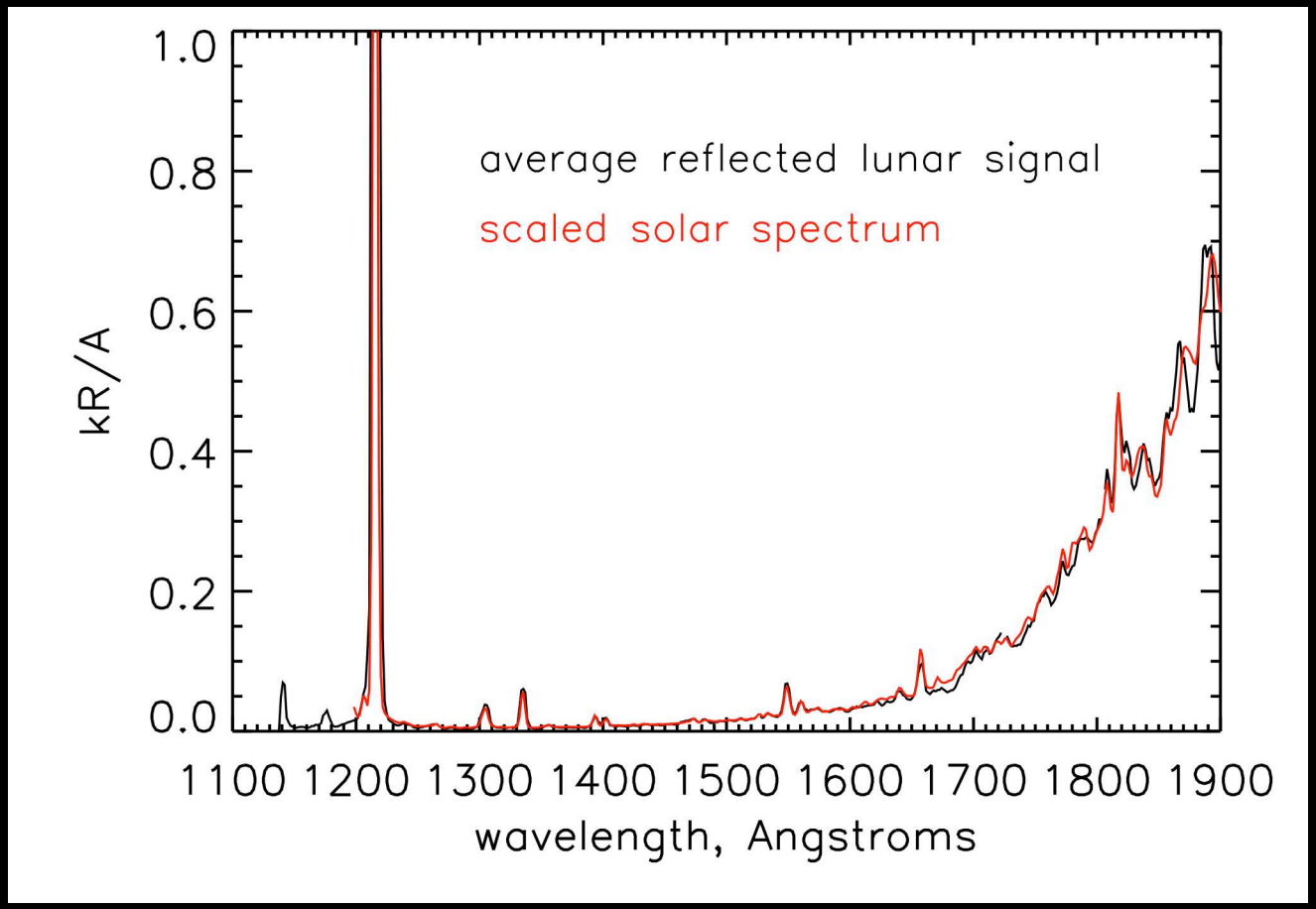
profile along slit



one temporal record

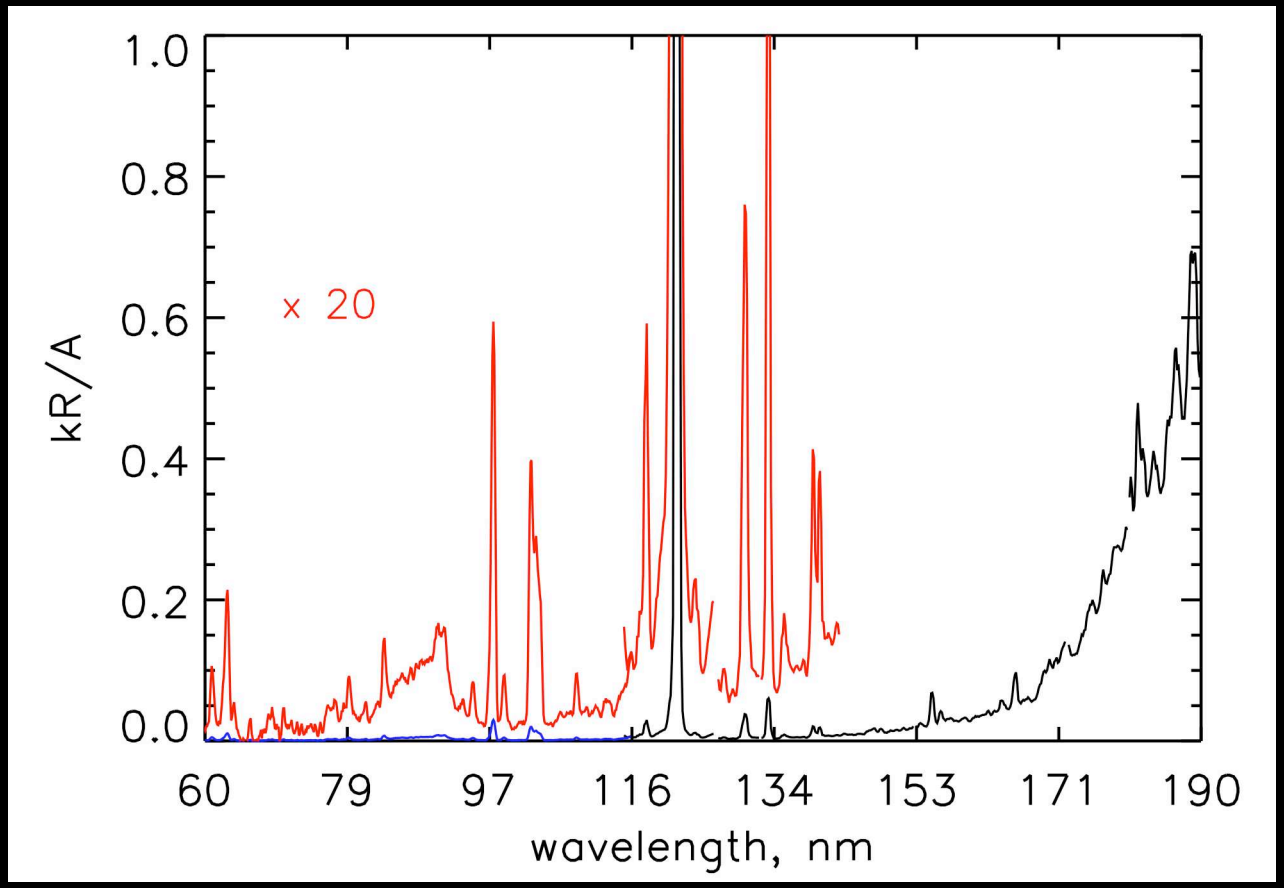


Ly-α signal on night side is darker than off body

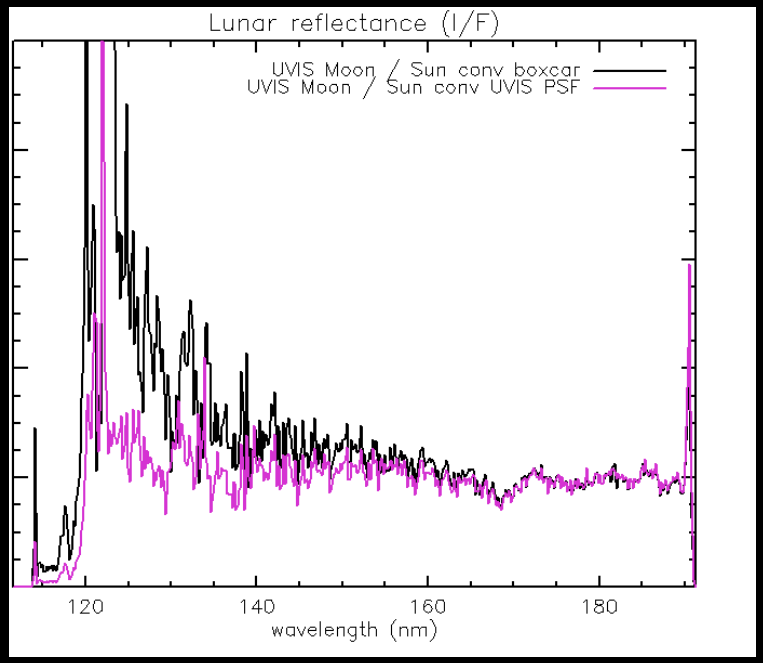


Solar spectrum from SOLSTICE on the day of the lunar observation - convolved with the UVIS PSF.

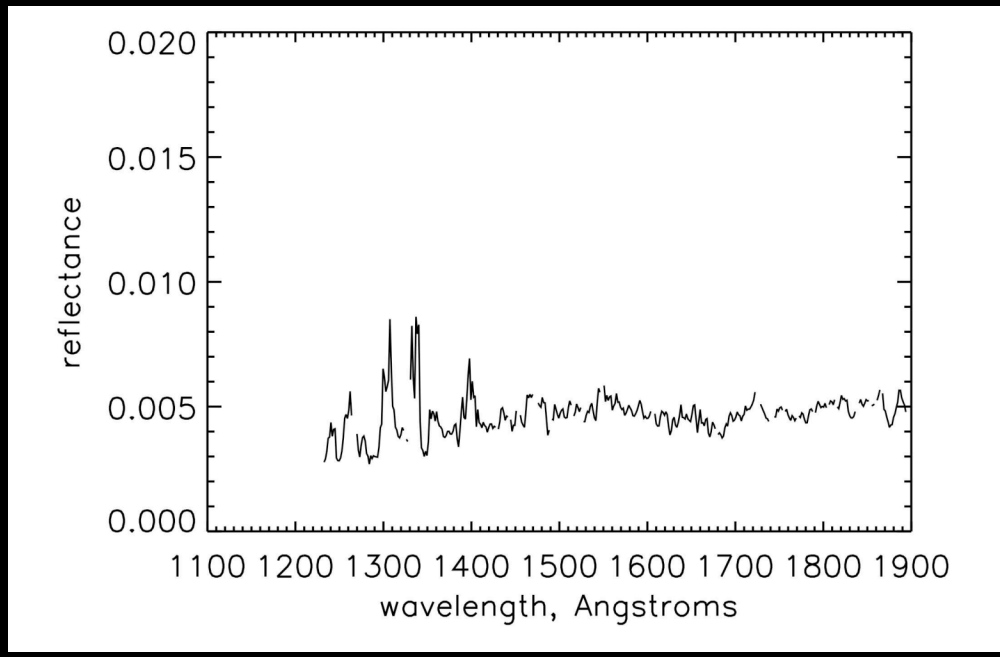
calibrated spectrum (FUV+EUV)



Reflectance spectrum (FUV)

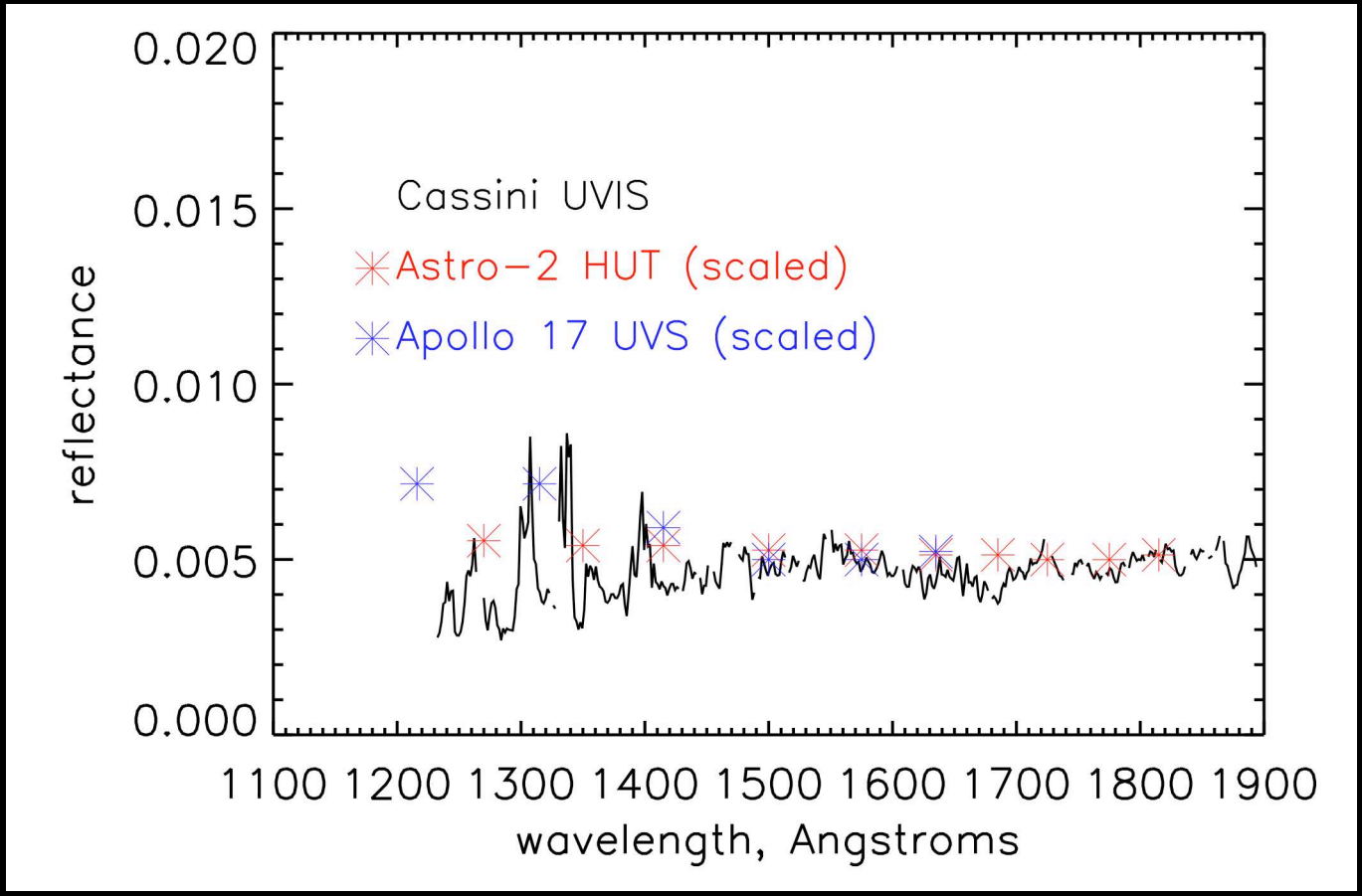


Effect of accounting for instrument PSF



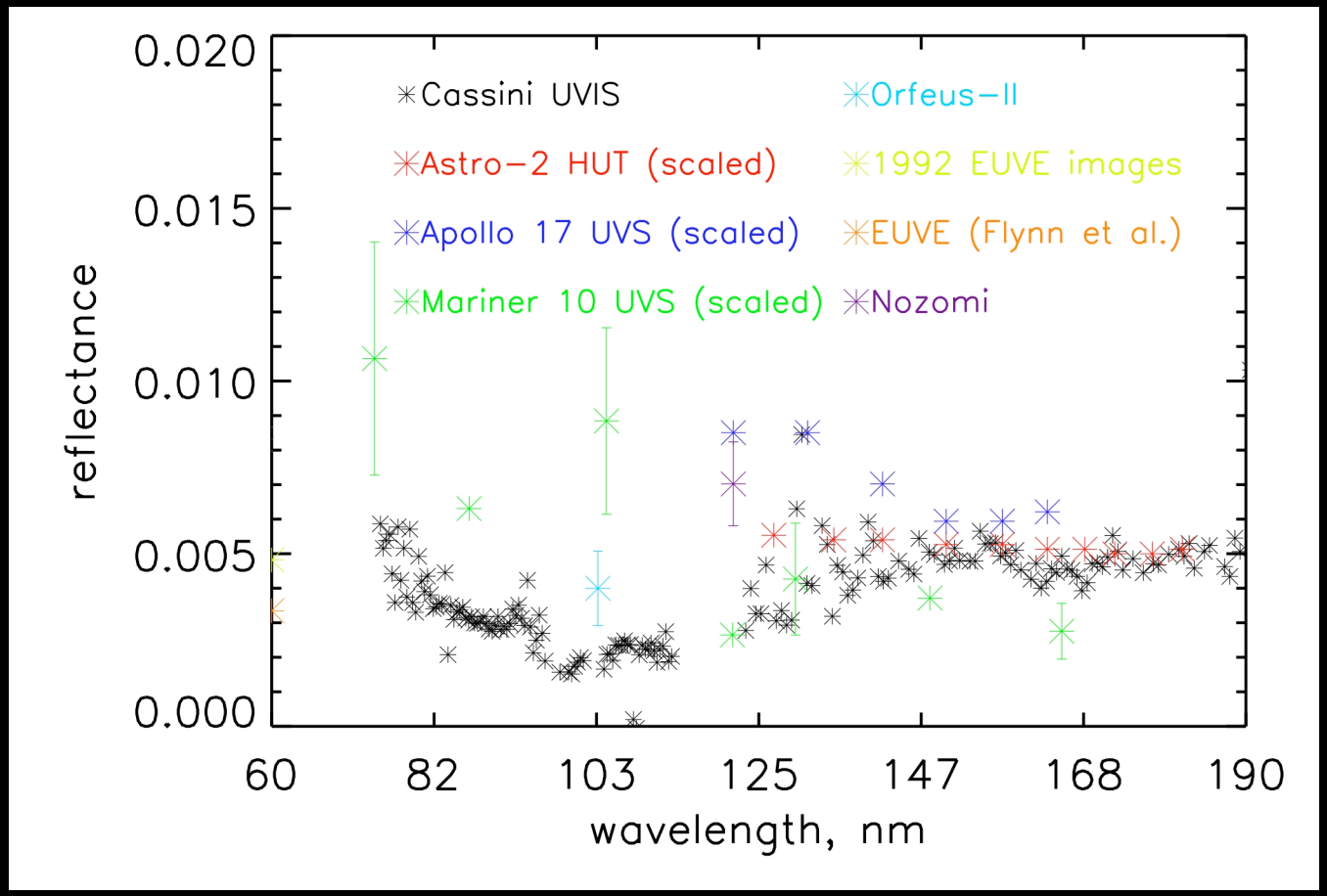
Moon reflects ~0.5% of incident light at 90° phase

Comparisons with previous observations



We simply scale the observations to agree with UVIS at ~1800 Å to look at spectral variations.

Reflectance spectrum (FUV+EUV)



Differences could be due to:

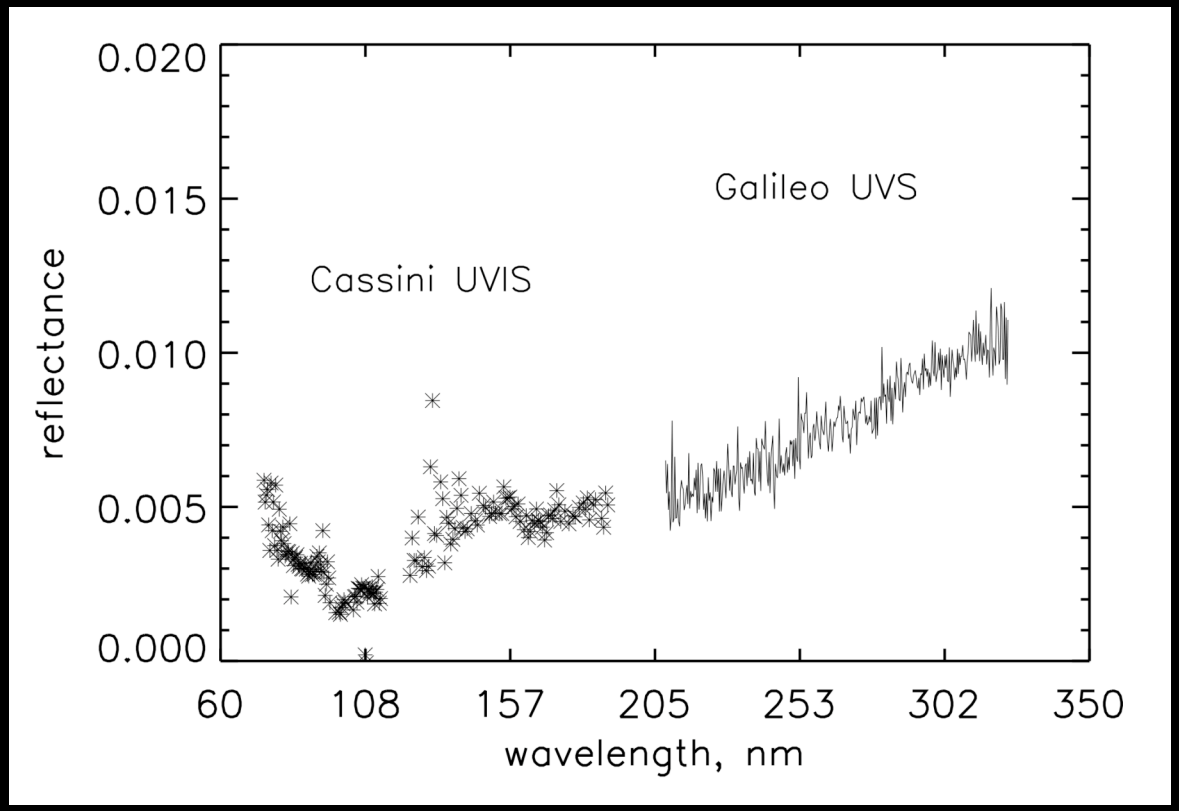
- calibration issues

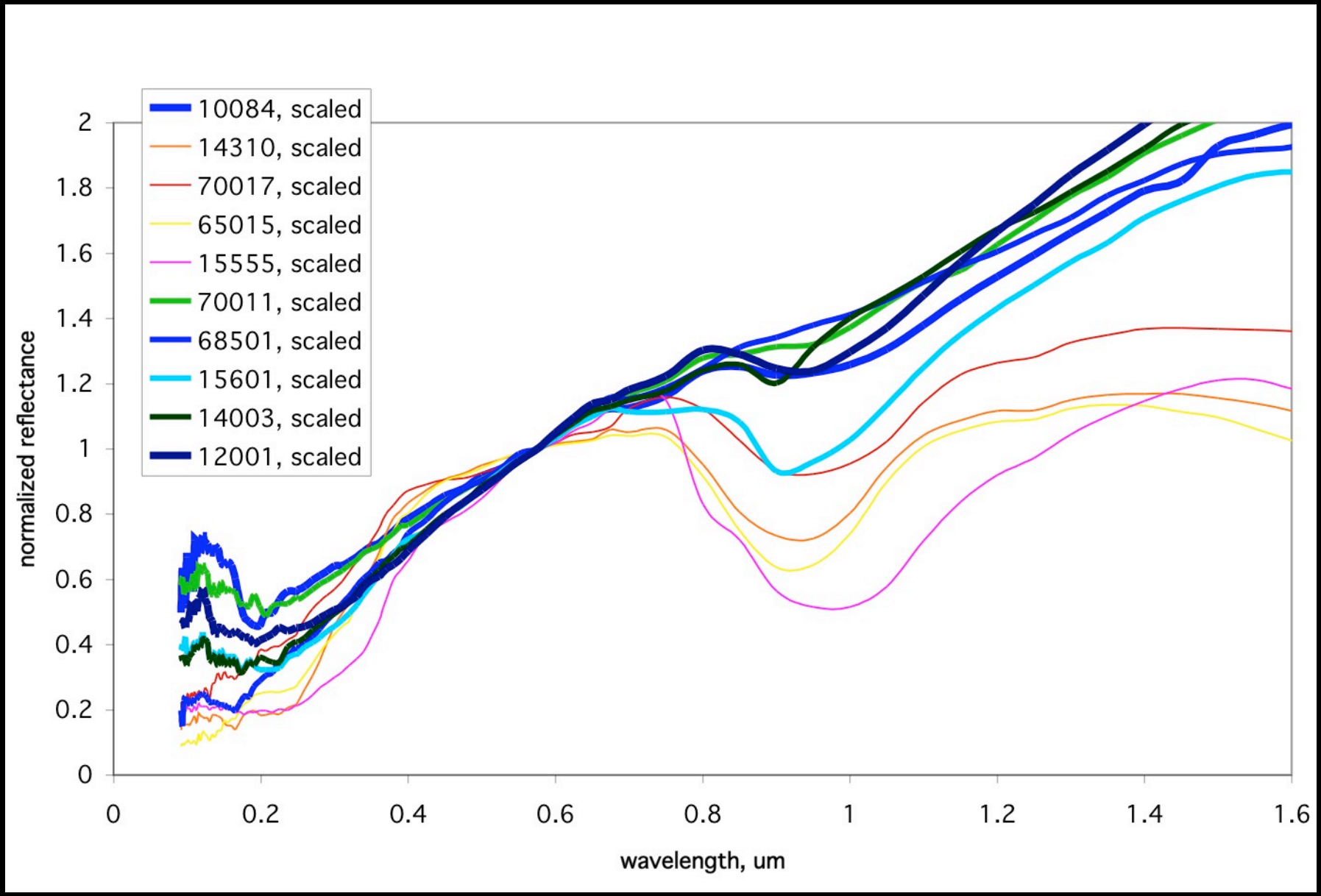
- spatial variations

- photometric corrections

Using a solar spectrum measured by the UVIS solar occ port

Reflectance spectrum (NUV+FUV+EUV)





LUNAR SAMPLES thick: soils thin: rocks

Summary

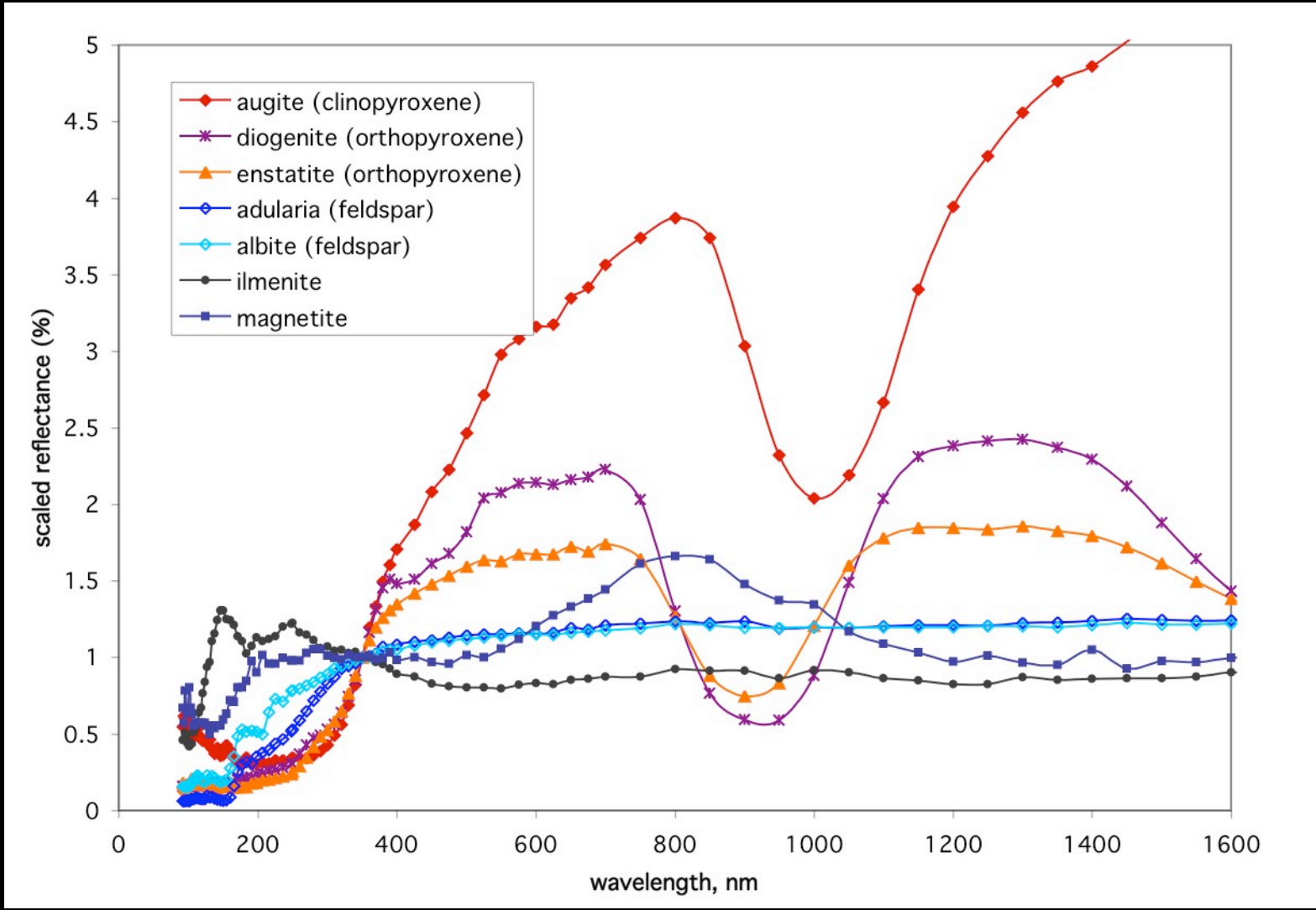
- Baseline UV spectrum
  - Can be used in LAMP analyses
- Space weathering effects are important in the UV
  - LAMP can potentially distinguish small fresh regions on the Moon
  - LCROSS impact site

Extra/backup slides

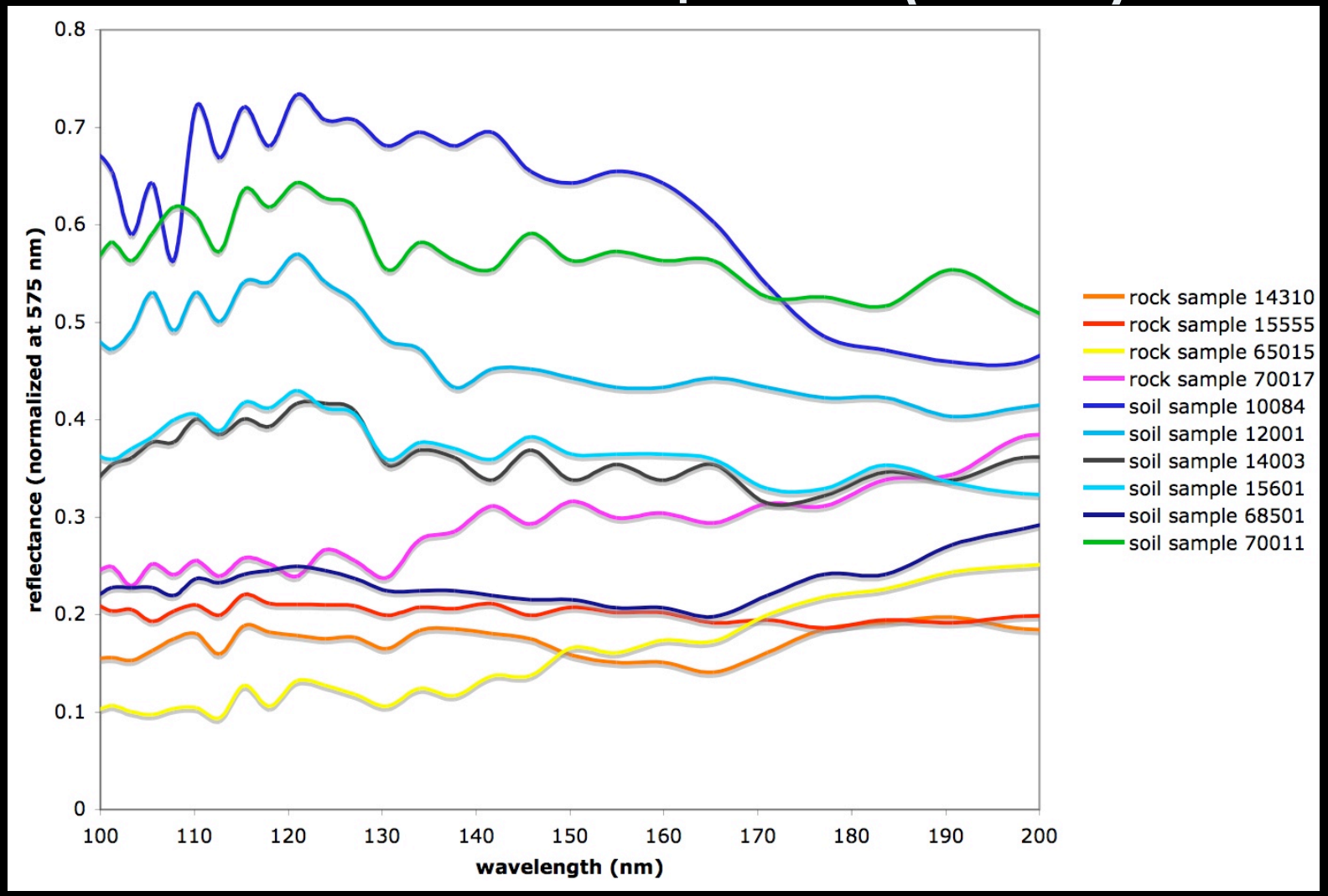
Follow-up tasks

- What EUV solar spectrum did we use for Phoebe??
- Ask Greg why his spectrum (pink & black plot) is so much darker than mine
- Re-do the average Galileo spectrum to confirm redness

Lunar-like minerals



Lunar samples (FUV)



Comparisons with lunar samples, lab data of other minerals

To make sure overall shape makes sense