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Supplemental Figures for

“The Distribution of Mg-Spinel across the Moon and Constraints on Crustal Origin”

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These thirteen figures are labeled “Figure SN”, where “N” corresponds to a closely related figure in the main body of the manuscript. This is to allow ease of comparison.

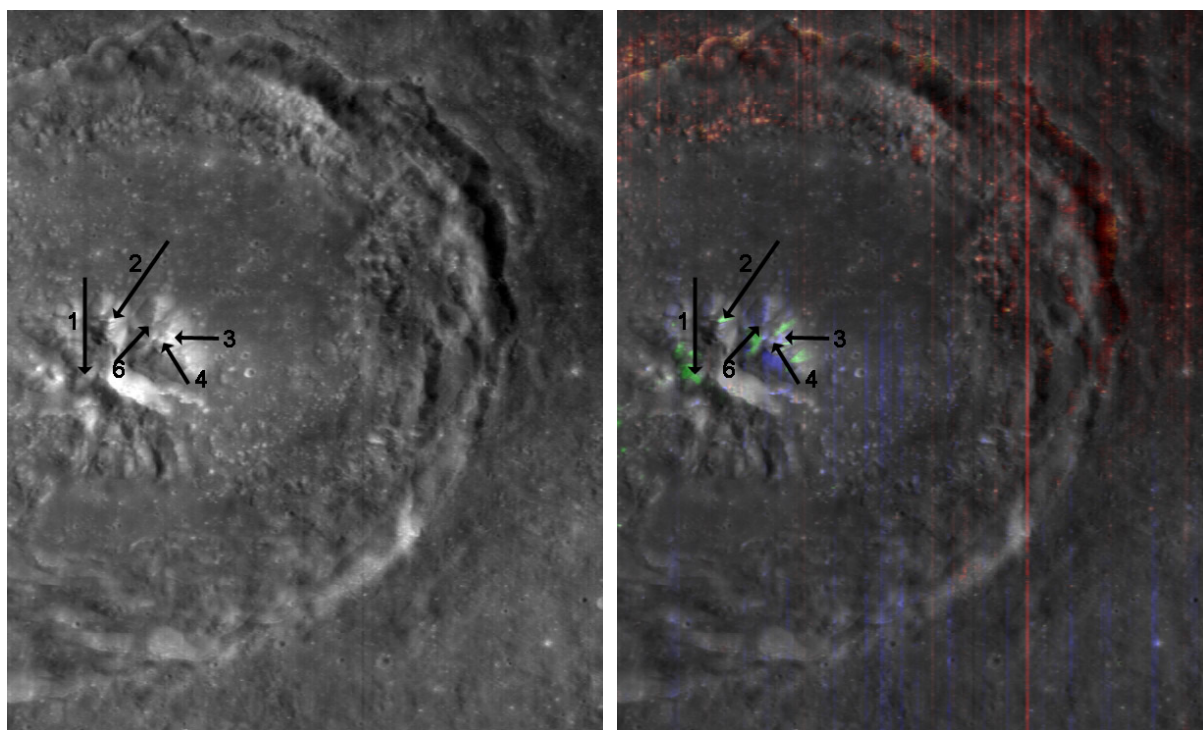


Figure S3. Independent M^3 data for Theophilus acquired during optical period OP2c3 and prepared similar to Figure 3. This optical period was from a higher altitude than OP1b data of Figure 3 and thus spatial resolution is lower. Left: reflectance image; Right: rock-type color composite superimposed on brightness image.

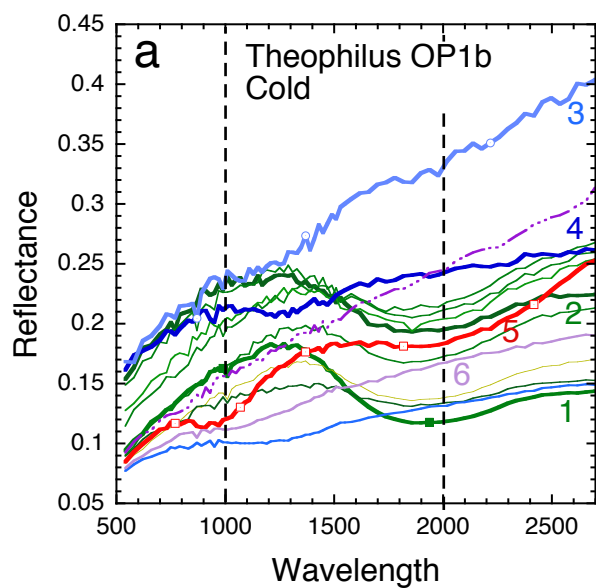


Figure S4. Reflectance spectra for Theophilus obtained during OP1b (Figure 4a) with several additional spectra from the central peaks.

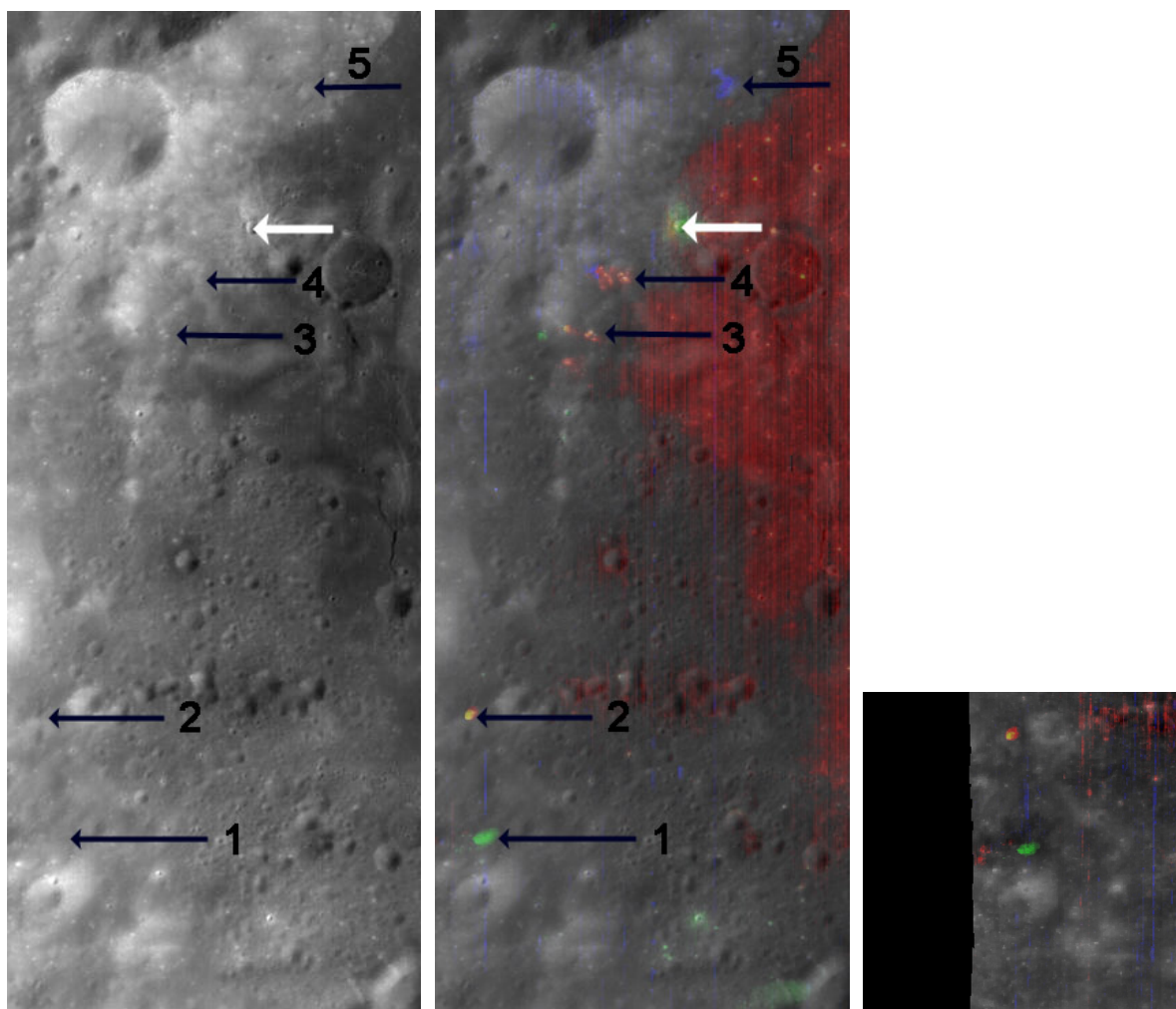


Figure S7. M^3 data for Moscoviense prepared similar to Fig.3. Left: OP1b reflectance image; Middle: OP1b rock-type color composite superimposed on brightness image (prepared similar to Figure 3); Right: Subset of independent OP1a rock-type color composite superimposed on brightness image. Black Arrows indicate areas 1-5 (bottom to top) of Pieters et al. (2011) that expose (respectively) only Mg-spinel, only low-Ca pyroxene, nearby Mg-spinel and low-Ca pyroxene, nearby low-Ca pyroxene and olivine, and only olivine. The small fresh crater near the mare upper middle (white arrow) is of complexly mixed lithology.

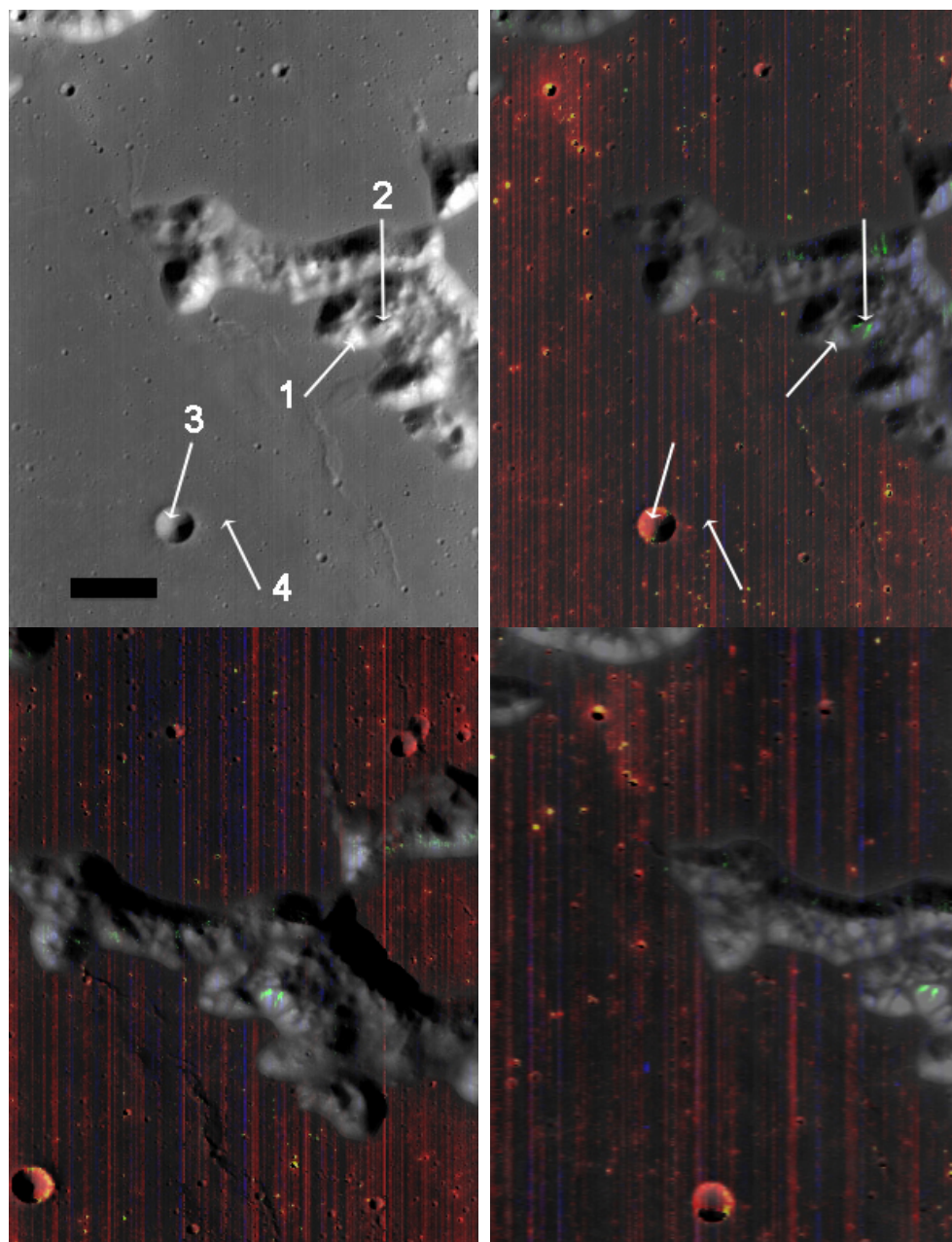


Figure S9 (a continuation of Figure 9). M^3 data for Montes Teneriffe. Top: OP1b Reflectance image and rock type color composite (similar to Figure 3). Bottom: OP2a and OP2c1 rock type

color composite images. Arrows indicate the location of spectra in Figure S10. Scale bar is 10 km.

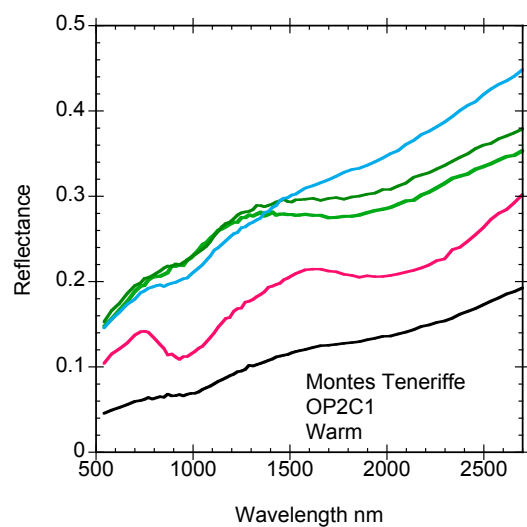
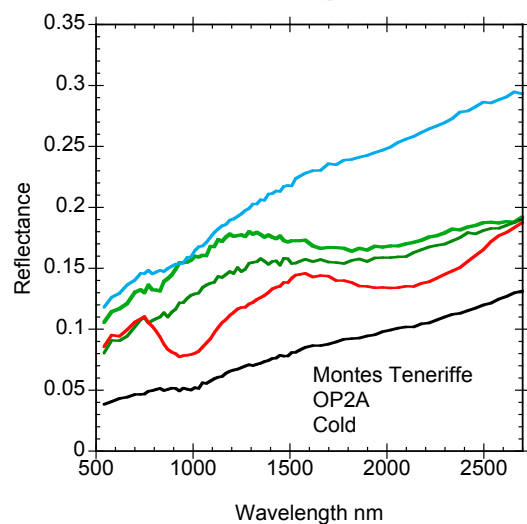
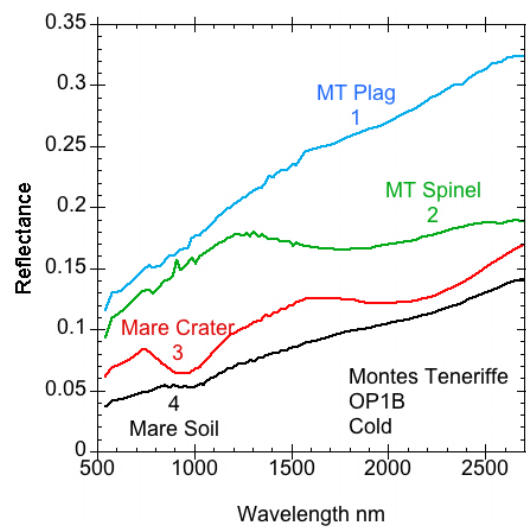


Figure S10 (a continuation of Figure 10). Independent Montes Teneriffe M3 spectra for the same areas obtained during three different optical periods with different illumination geometry. For OP1b the second spinel area was largely in shadow.

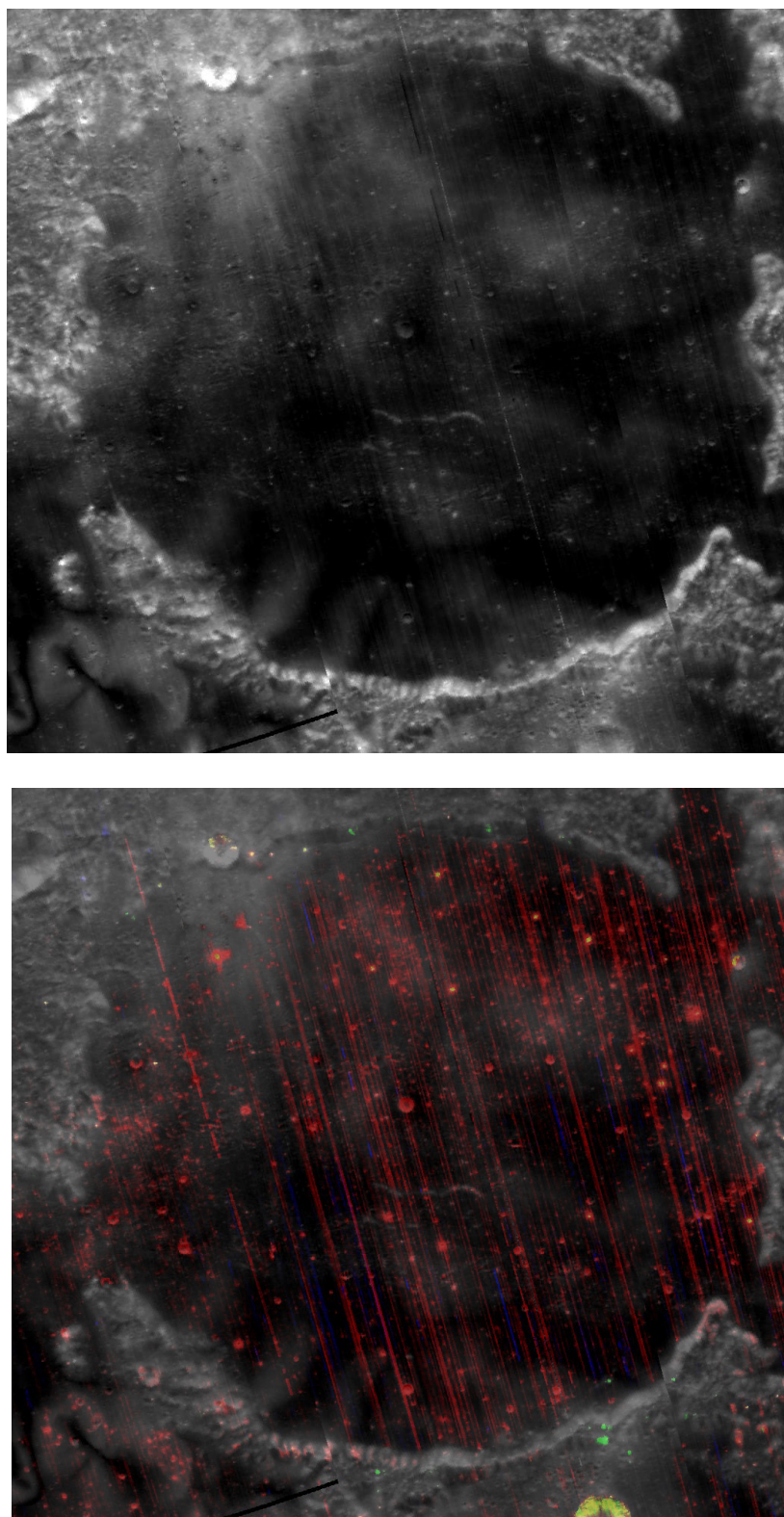


Figure S12. Mosaic of M^3 data for Thomson acquired during optical period OP2c1 prepared similar to Figure 3. Some spatial resolution is necessarily lost during the re-sampling of mosaic preparation.

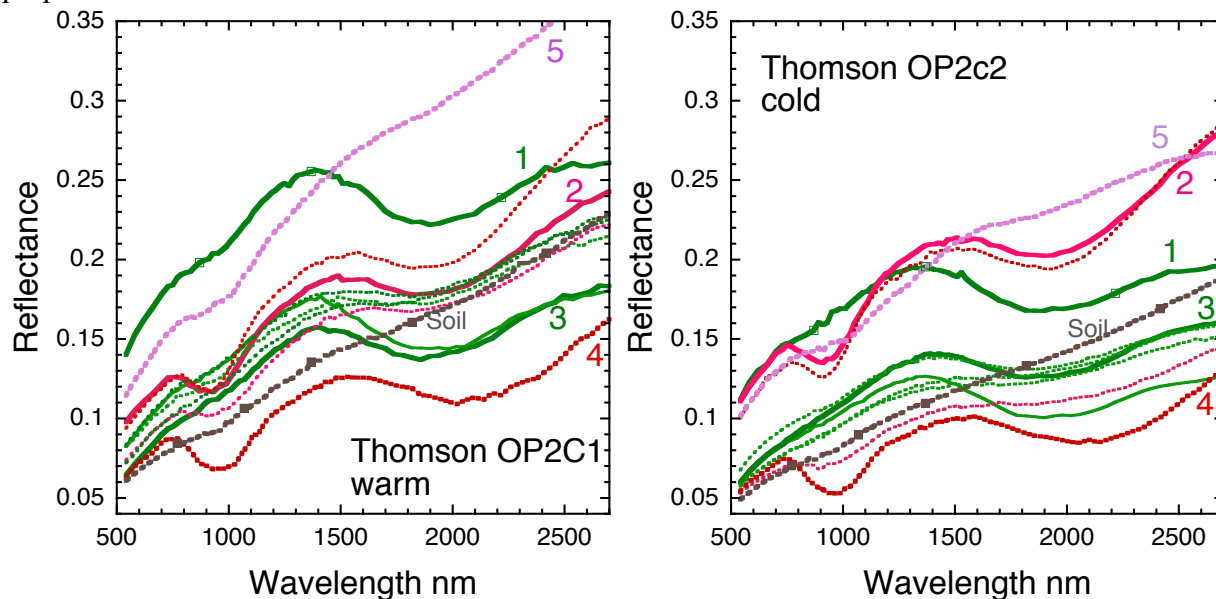
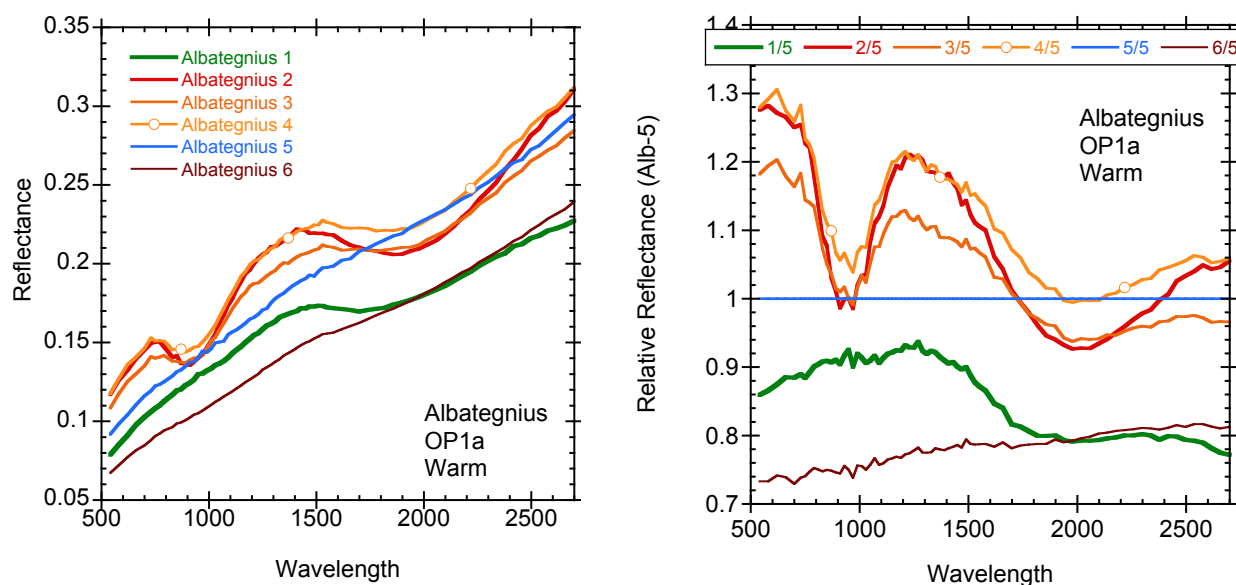


Figure S13. M^3 spectra for the same areas in Thomson acquired during independent periods OP2c1 and OP2c2 (Figure 13) with spectra included for several additional areas. Areas along the southern rim are shown in solid lines; areas along the northern rim are in dotted lines.



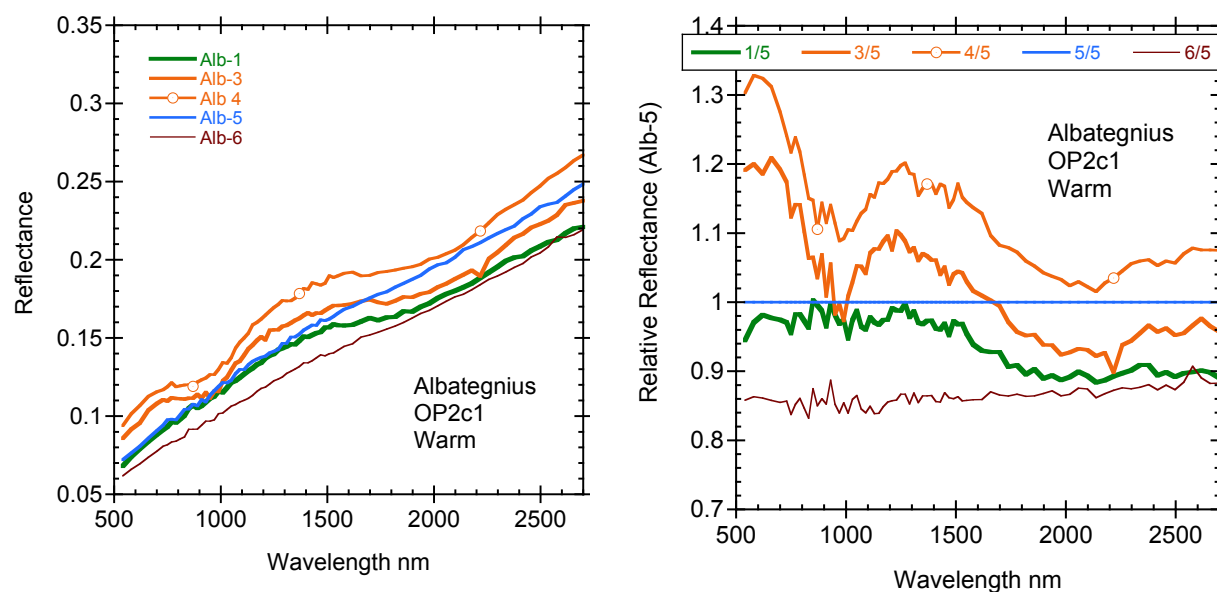


Figure S16 (a continuation of Figure 16). Independent M^3 Albatregnius spectra for the same areas obtained during optical periods OP1a and OP2c1. (Top) M^3 Level 2 Reflectance spectra. (Bottom) Reflectance spectra relative to featureless area #5 on the central peak.

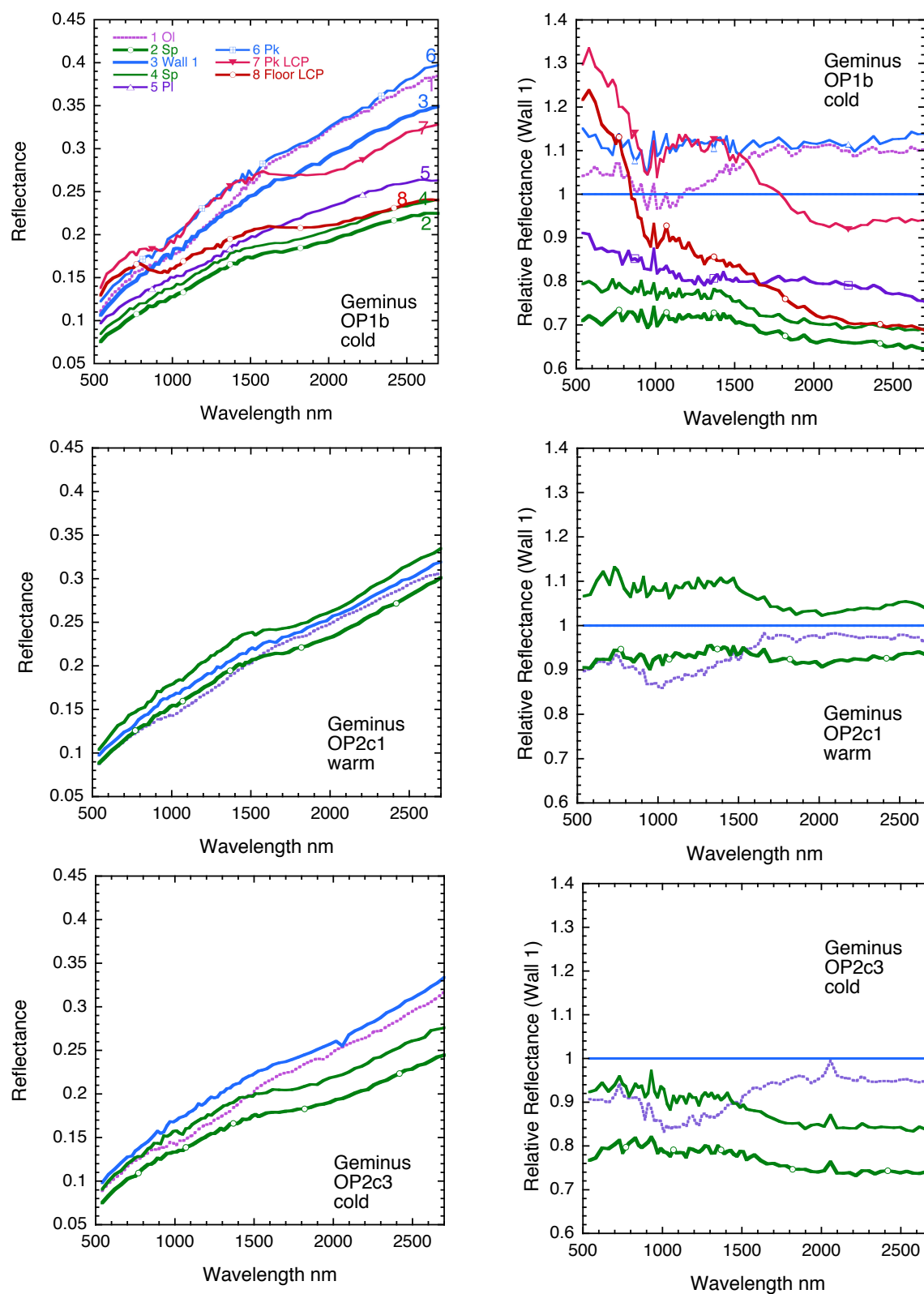


Figure S18 (a continuation of Figure 18). Independent Geminus M³ spectra for the same areas (1,2,3,4) obtained during independent optical periods with different illumination geometry. Level 2 reflectance spectra are on the left and reflectance spectra relative to Wall-1 on the right.

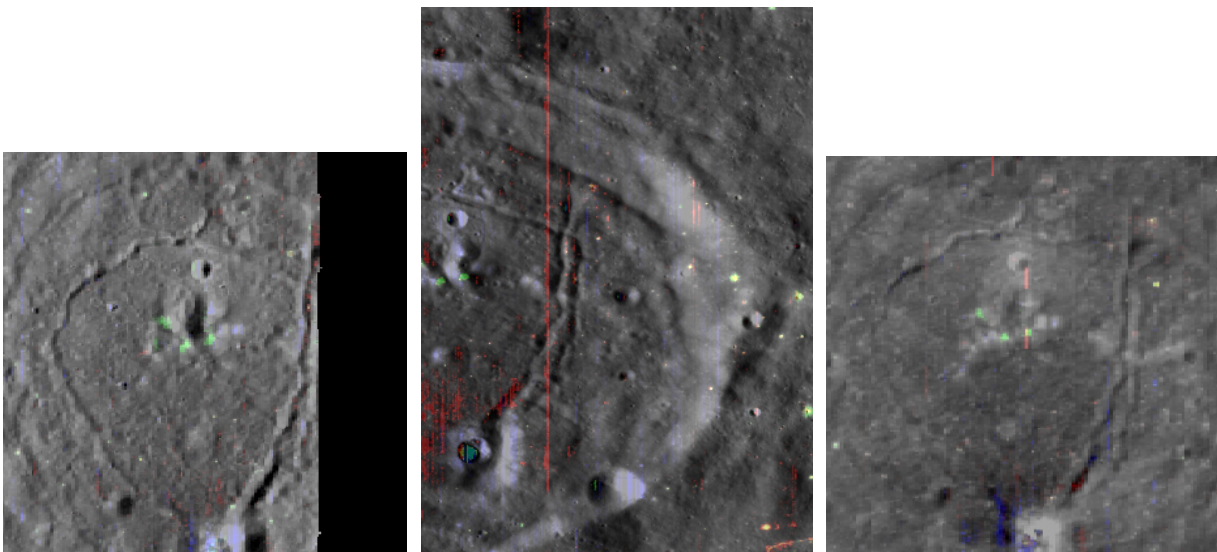


Figure S19. Independent M³ rock-type color composites prepared similar to Figure 3 draped over measured reflectance of Dalton obtained during three additional independent optical periods. Left to right: OP1b, OP2a, OP2c.

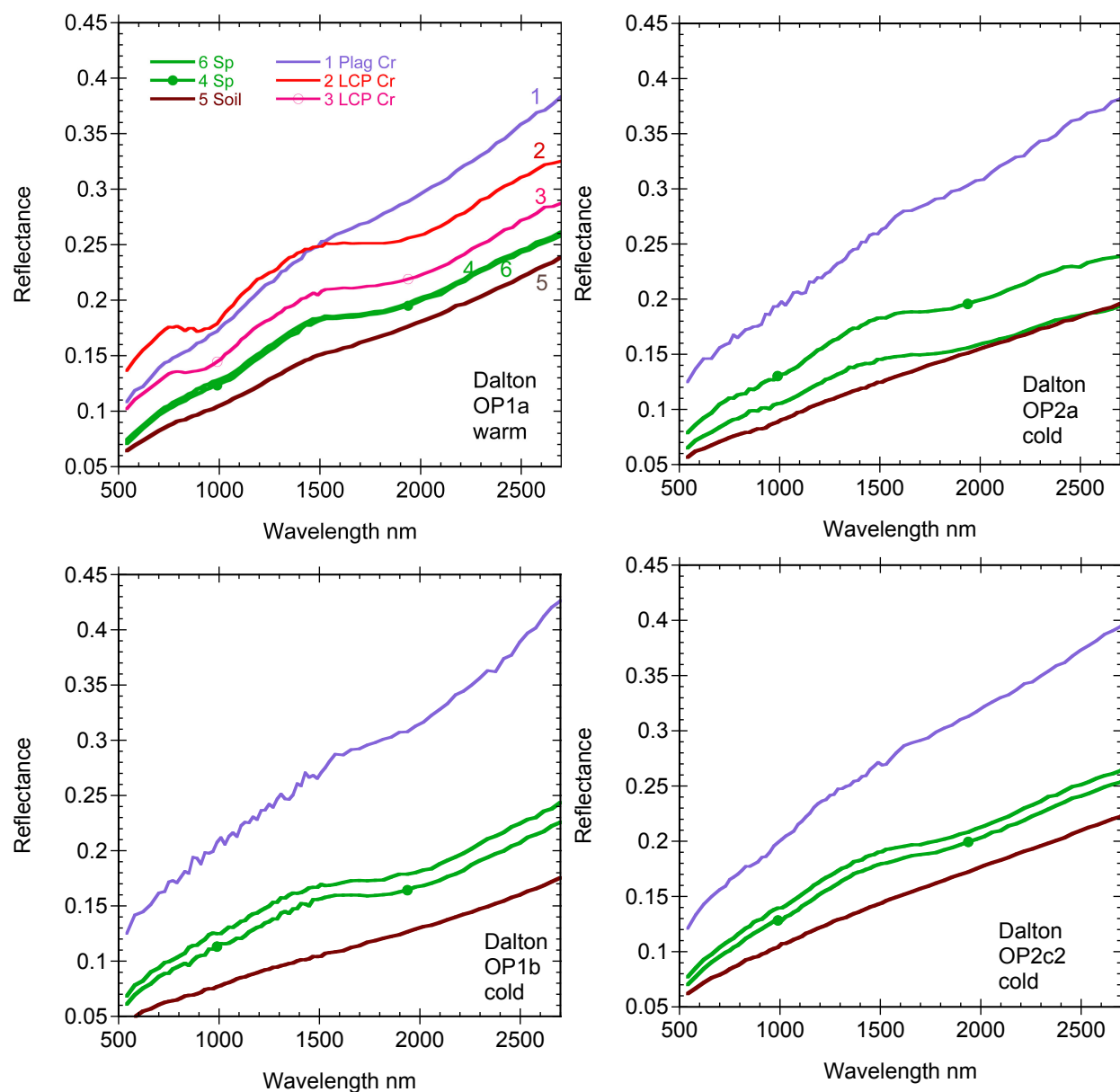


Figure S20 (a continuation of Figure 20). Independent Dalton M³ spectra for the same areas (1, 4, 5, 6) obtained during four different optical periods with different illumination geometry.

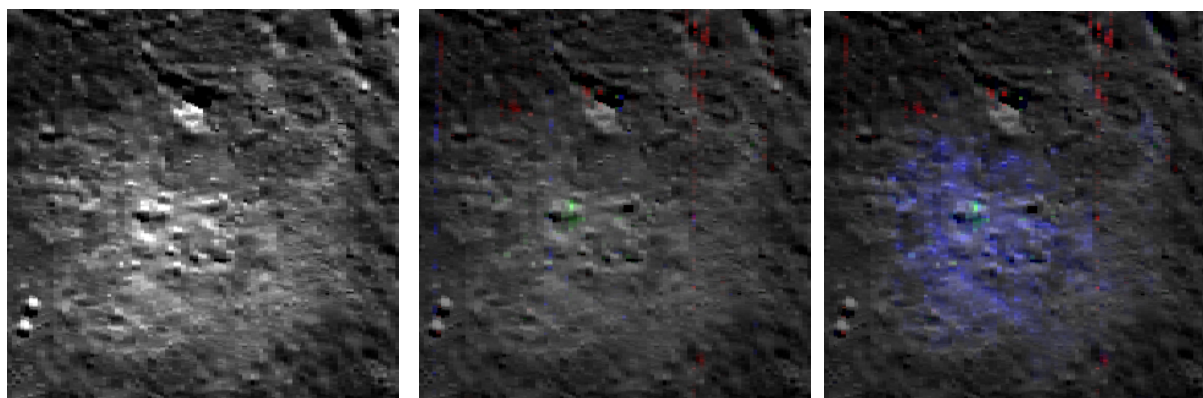


Figure S21. M^3 data for Compton-Belkovich OP2c1. Left: 1489 nm reflectance. Middle: Rock-type color composite superimposed on brightness image prepared similar to Fig.3. Only one small area of spinel-bearing lithology is found. Although the properties meet the criteria of Section 2.1, the presence of spinel cannot be confirmed with only a single measurement. Right: same as middle, but with OH band depth parameter replacing Plagioclase ratio illustrating that the entire region exhibits prominent OH absorption (Petro et al., 2012; Bhattacharya et al., 2013).

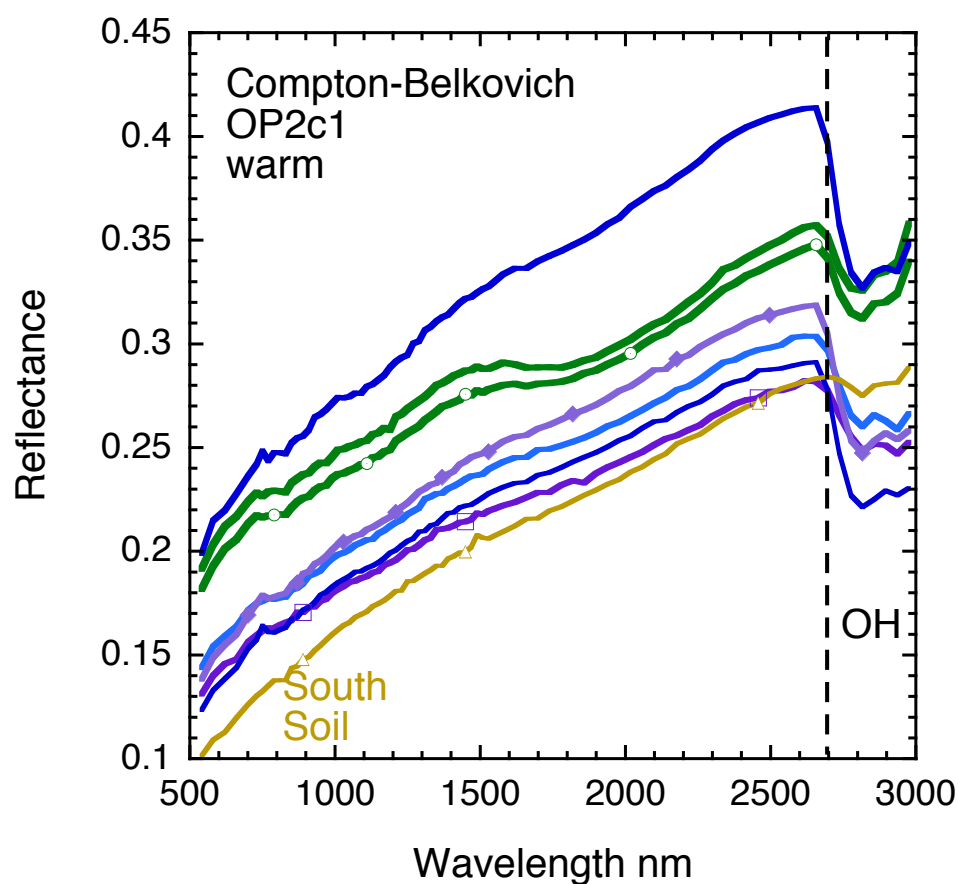


Figure S22. M^3 spectra across the Compton-Belkovich region. Two pixels from the single area of spinel are shown in green and typical areas across the rise are shown in blue. A prominent absorption due to OH/H₂O is seen at wavelengths beyond 2700. Soil directly south of the rise exhibits more typical OH for these latitudes.