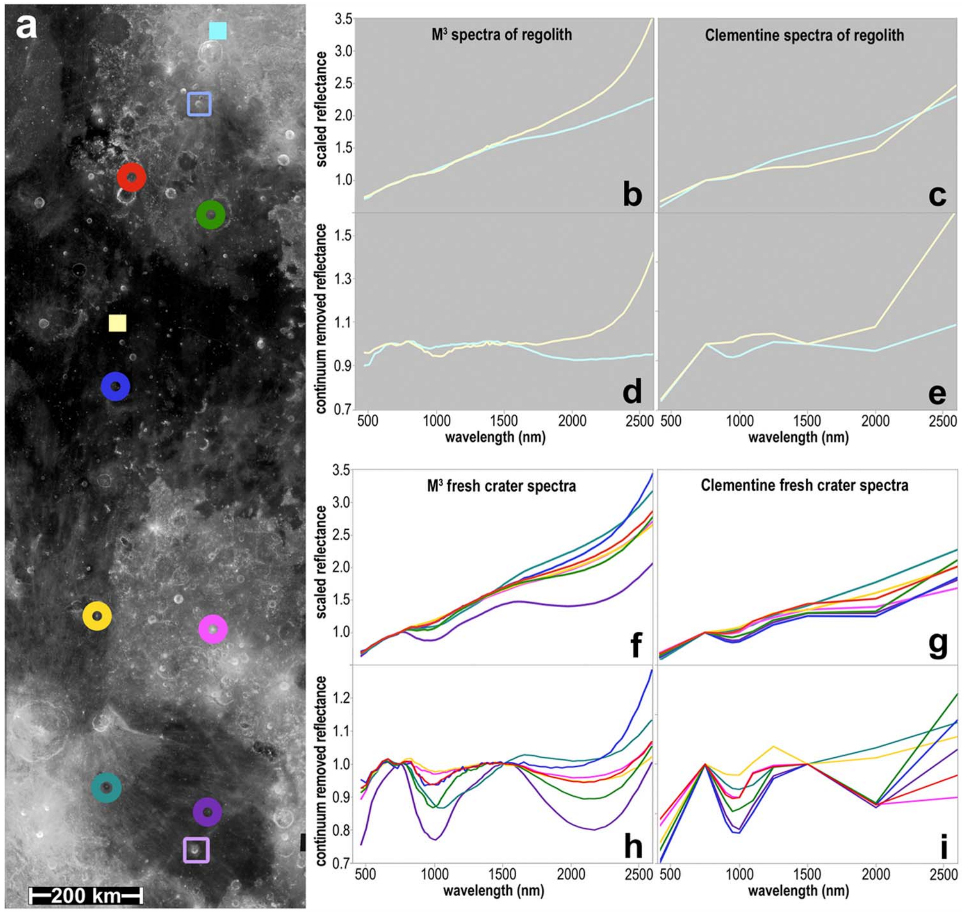

Figure 3. (a) Clementine 750 nm reflectance image depicting locations from which sampled spectra from both Clementine and M^3 were derived. Colors of squares correspond to colors of spectra in Figures 3b–3e; colors of rings correspond to colors of spectra in Figures 3f-3i. The open blue and lavender squares depict locations of the craters and spectra detailed in Figures 4 and 5, respectively. (b) M^3 spectra scaled to 750 nm albedo of surface regolith (squares in Figure 3a). (c) Clementine spectra scaled to 750 nm albedo of surface regolith (same squares in Figure 3a). (d) Continuum removed M^3 spectra; continuum calculated at 750 nm and 1510 nm. Continuum removed Clementine spectra; continuum calculated at 750 nm and 1500 nm. (f-i) Same as for Figures 3b–3e except spectra derive from immature craters (rings in Figure 3a).

[9] Clementine's conversion to reflectance did not use the preferred method of normalizing the radiance calibration to the incident solar irradiance. Instead they used an absolute calibration based on observations of the Apollo 16 landing site and laboratory reflectance measurements of Apollo 16 soil sample, 62231 [*McEwen et al.*, 1998; *Pieters*, 1999]. The Apollo 16 site was selected as a calibration target because the region is relatively homogeneous, and since it is largely battered anorthositic highland material, the spectrum is bright and relatively free of absorption features that could introduce calibration artifacts. The soil sample measurements were relative to a halon standard and acquired at laboratory standard geometry ($i = \alpha = 30, e = 0$) at the RELAB facilities at Brown University [*Pieters*, 1983; *Pieters and Hiroi*, 2004]. To convert to reflectance, gain-, offset-, and flat field-corrected DNs were photometrically corrected to the same viewing geometry as the laboratory measurements of the Apollo 16 soil sample. The Apollo 16 soil sample was normalized to the calibrated DN to obtain a spectral calibration correction factor that can be applied to any photometrically corrected lunar region.

[10] The Apollo 16 soil measurements were made out to 2500 nm, and so could be convolved for all UV-VIS bands and the first four bands of the NIR data (1100–2000 nm) [*Eliason et al.*, 2003]. The derived NIR reflectance values were then compared with the same Apollo 16 landing site to obtain a normalization factor. The 2600 and 2780 nm bands were not included in this calibration because reflectance information was not available, and because the reflectance signal is complicated by thermal emission at these wavelengths.

[11] Efforts to develop a lunar photometric function based on Galileo [*McEwen et al.*, 1996] and Earth-based telescopic observations [*Hillier et al.*, 1999] demonstrated early on the difficulties associated with trying to completely remove the effects of viewing geometry. Although photometric behavior does vary with terrain, the photometric correction used to create Clementine's DIMs does not vary