



## Spectral and morpho-stratigraphic units integration on Apollo basin and Leibnitz/Von Karman craters on the Moon

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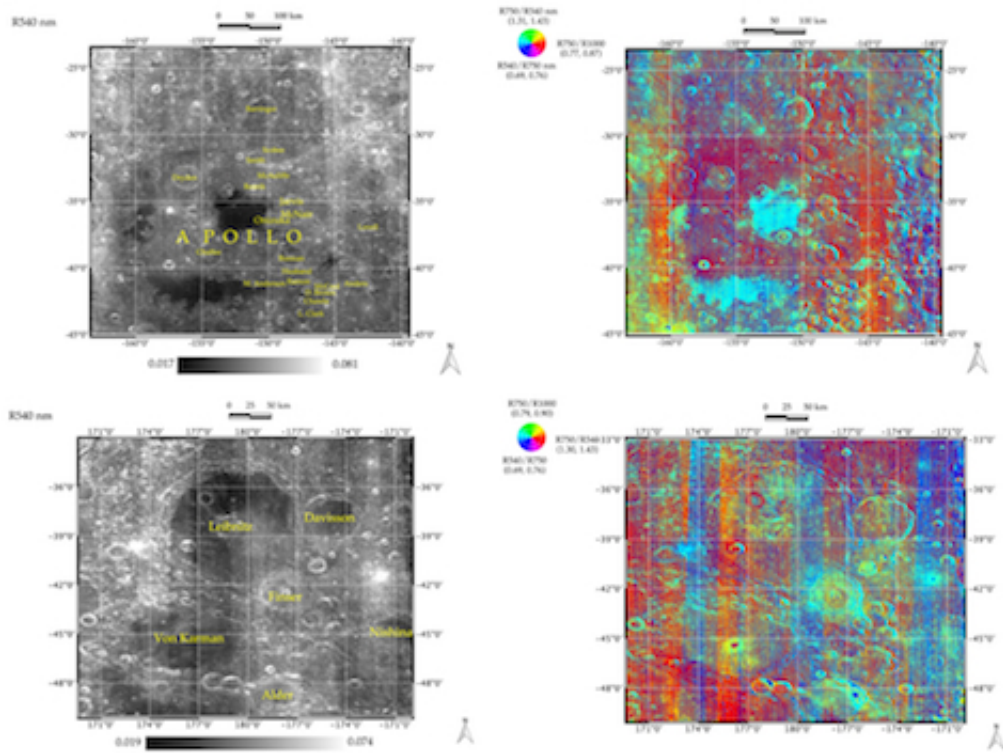
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South Polar Aitken (SPA) is the largest and deepest basin on the Moon [1, 2], and several regions within this widespread basin have been considered as possible landing sites for present and future missions. Some of these sites are also targets of the H2020 n° 776276- PLANMAP project [3]. In this work, we focus on specific areas within SPA, Apollo basin, Leibnitz and Von Karman craters regions (see fig. 1). For our analysis, we considered the M<sup>3</sup>/Chandrayaan-1 data [4], after the application of the last calibration, thermal removal and photometric correction [5, 6].

SPA is rich in high Ca-pyroxenes, except for some central crater peaks, where low Ca-pyroxenes dominate, and no extensive olivine-rich areas are observed [1, 7, 8]. Based on the spectral characteristics on the M<sup>3</sup> spectra, we define specific spectral parameters, such as band centers, depths, spectral slopes, including selected RGB color composite combinations [5]. These indices are the starting point for retrieving the spectral units of the regions considered. The final aim of this work is to find a link between spectral, and morpho-stratigraphic units [9] to reach out highly informative geological maps of the Moon. This innovative approach holds the efforts of different research units and is one of the main goals of the PLANMAP project.

**References:** [1] Ohtake, M. et al., 2014, GRL. [2] Moriarty, D.P. et al., 2018, JGR. [3] <https://www.planmap.eu/>, [4] Pieters et al., 2009, Current Science., [5] PLANMAP D4.3- Spectral Indices and RGB maps. [6] Besse, S. et al., 2012, Icarus. [7] Dhingra, D., 2018, Geosciences. [8] Melosh, H. J., et al., 2017, Geology. [9] Ivanov, M.A., 2018, JGR.

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**Figure 1:** Apollo basin (top-left) and Leibnitz and Von Karman craters (bottom-left) reflectance map at 540 nm. Apollo basin (top-right) and Leibnitz and Von Karman craters (bottom-right) Clementine-like mosaic derived by M<sup>3</sup> data (bottom-right).