

**LUNAR CRUSTAL EVOLUTION: WHAT DO WE SEE?**

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The last decade has brought an unprecedented flux of new data about the compositional character of the lunar crust as derived from remote measurements. The data come largely from diverse advanced sensors on Kaguya, Chandrayaan-1, and LRO. The stratigraphy of compositional properties of the crust is further constrained by integrated geophysical data from LRO and GRAIL. Although these data are necessarily incomplete, they provide fundamental new perspectives and there is much to discuss!

Example crustal composition highlights include:

- Discovery and mapping the distribution of Pure Anorthosite (PAN) as a magma ocean product
- Expanding the search for and detection of olivine across the Moon and opening issues associated with Mg-suite vs mantle origin
- Discovery of a new rock type, Mg-spinel anorthosite, that appears to be associated with Mg-suite emplacement
- Likely identification of small highly silicic regions
- Discovery of widespread surficial OH as well as local concentrations of OH/H<sub>2</sub>O
- Recognition and mapping of the relative abundance and distribution of Mg-rich pyroxene across the highlands
- Virtual exploration of basins and large craters that provide (complex) clues to the interior
- Numerous ‘unusual’ or ‘special’ areas continue to be identified (Compton Belcovich, Ina, Hansteen Alpha, etc.)
- Etc.

These global and regional data should be discussed as an integrated whole within the context of modern detailed lunar sample information.

Example issues to address/discuss (in no particular order):

- What is the origin of the Mg-suite and how is it related to FAN/PAN?
- Ie... what IS the lunar crust and how was it formed?
- How can/should we distinguish between lower crust and the mantle?
- What IS the lunar mantle?
- Did mantle ‘overturn’ occur and if so, how did that event affect the lunar crust?
- How well mixed (and how deep) is the megaregolith?
- What caused the apparent highly asymmetric distribution of radiogenic elements?
- How can compositional properties observed in and around craters/basins improve our understanding of the cratering process? And visa-versa?
- Etc., etc., etc.