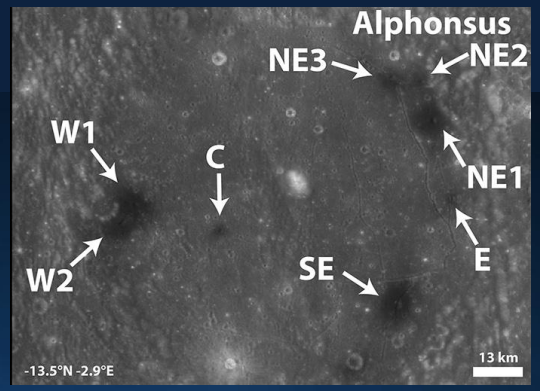
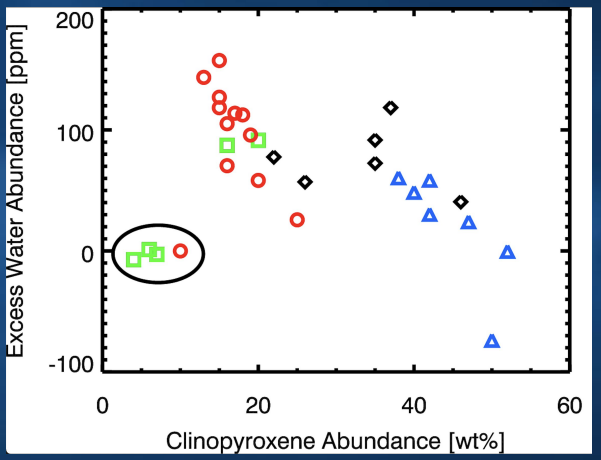
Determining key characteristics of lunar pyroclastic deposits from remote sensing data products



Lunar pyroclastic deposits in Alphonsus on the Moon



All symbols represent lunar pyroclastic deposits and show a strong relationship between pyroxene and interior water. Circled are outliers.

Understanding key characteristics of lunar pyroclastic deposits is critical to enhance our knowledge of lunar evolution; however, sampling pyroclastic deposits on the Moon is highly limiting requiring scientists to innovate new ways to obtain this information through existing data products.

- Recently, scientists have combined a variety of remote sensing data products to examine several pyroclastic deposits on the Moon (top figure).
- Results from this study (bottom figure) show relationships between interior water, mineralogy, and physical regolith properties, which allowed the researchers to determine the cooling rate and optical density of the volcanic plume, volatile/gas content, and fragmentation of the lunar volcanic eruption.
- The results of this study show that critical parameters needed to model the volcanic and magmatic characteristics of volcanoes on the Moon can be obtained using available remote sensing data products, further enhancing the scientific return of mission data. This will improve our understanding of volcanoes throughout the solar system through the utilization of spacecraft data.

Trang et al. (2022) *Icarus*