Evolution of the Lunar Crust
[New Views of the Moon 2]

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1 Introduction All

1.1 General Scope

Evolution of the lunar crust relates largely to the first 500 Ma of lunar history. It includes formation of a primary crust and several different types and phases of secondary crust as well as tertiary crust that involves reprocessing of primary and secondary.

The beginning of lunar crustal evolution is set by the character and evolution of the Magma Ocean that formed a mantle and distinctive anorthositic primary crust within ~200 Ma after formation of the Moon. An apparently less abundant, but pervasive, mafic-bearing secondary crust component (Mg-suite) formed nearly contemporaneously and is discussed here. The lunar crust continued to be shaped and evolved through the period of intense solar system heavy bombardment and as the primordial lunar mantle partially melts, sending magmas upward into the crust and resulting in mare basalt volcanism that peaked ~3.2-3.5 Ga.

Reference relation to other chapters...

2 Secondary and Tertiary Crust: Lunar Sample Foundation Elardo assigns

2.1 Brief review of the chronology of the early lunar crust [Elardo]

2.2 Mg-suite: Beyond the Apollo View [Gross, Elardo]

2.2.1 Evidence for KREEP-free Mg-suite lithologies?

2.3 New lithic clasts in brecciated lunar meteorites [Gross, Treiman]

2.3.1 Mg-spinel rich lithologies and experimental studies of their formation

2.3.2 Meteorites from the ancient lunar crust - (e.g., Kalahari 009), other lithologies

2.4 Magnesian anorthosites and granulites [Gross]

2.5 Felsic/silicic magmatism [Jolliff]

2.5.1 Models for the formation of silicic clasts

2.6 Mare Basalts [Elardo]

Diversity, continual discoveries (and surprises), importance of expanding samples, importance of new technology (spacecraft and laboratory) to explore in greater detail....