

Composition and Origin of the Moon

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Date: 3.25.2016 (Fri.) 16:30 – 18:30

Venue: Meeting Room #486, Science Research Bldg 1, Ehime Univ.

Recent geochemical studies on the Apollo samples provided a challenge for our understanding the origin of the Moon. They include the confirmation of extreme similarities in the isotopic compositions between the Moon and Earth and some evidence of not-so-dry Moon. Among these, "evidence" for not-so-dry Moon is controversial and some discusses that "not-s-dry" samples are anomalies and the bulk of the Moon is dry. I will provide geophysical observations that show, indeed, that the bulk of the Moon is not-so-dry. Explaining the extreme similarities in isotopic compositions and the relatively water-rich Moon in a commonly accepted model of a giant impact origin of the Moon is challenging. High degree of heating by a giant impact would imply depletion of much of water. Also previous models of a giant impact that explain the high angular momentum of the Moon-Earth system lead to the lunar composition that is dominated by the composition of the impactor. I will provide models of physical processes of a giant impact to solve these puzzles.