

The
57th

GRC INTERNATIONAL FRONTIER SEMINAR

**Reducing conditions in the inner Solar System,
as witnessed by Mercury and Earth**

Dr. Asmaa Boujibar (NASA Johnson Space Center in Houston)

Date : 24.Jun.2016 (Fri.) 16:30 – 18:30

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

The different steps leading to the chemical and structural properties of terrestrial planets are still relatively poorly constrained. This is mainly due to uncertainties relative to the nature of the building blocks. For instance, each planet displays a chemical composition and redox state different from all known chondrites. This suggests either an incomplete sampling of the nebular material through the meteoritic collection, or extensive modification of the chemistry of the growing planetary embryos. However major constraints point to reducing conditions in the inner Solar System, as (i) Mercury's large core and reduced surface and (ii) the stable isotopic composition of Earth very similar to the reduced enstatite chondrites.

Although these meteorites have chemical compositions different from terrestrial and mercurian material (SiO_2 -rich for both planets, alkali-rich for Earth and O-rich for Mercury), they remain the only known reduced undifferentiated meteoritic material. I will present the similarities between chondritic and planetary material and discuss whether the chemical differences can be resolved by planetary differentiation processes as core segregation, mantle melting and collisional erosion. I will also show how these reducing conditions in the inner Solar System have significant implications for internal heat generation through the sequestration of radioactive elements in the planetary cores.

Contact: Prof. Tetsuo Irifune (e-mail: irifune@dpc.ehime-u.ac.jp)
<http://www.grc.ehime-u.ac.jp/>

