CONTROL ID: 2256399

TITLE: The Delivery of Biogenic Species to Terrestrial Planets

ABSTRACT BODY:

Abstract Body: Recent observations started revealing the potential diversity in compositions of extrasolar planets. With the expectation of the further constraints in the future, it is crucial to understand how the final composition of planets is related to planet formation processes. A few groups have estimated the elemental abundances of simulated Solar System planets and successfully reproduced a global trend of the compositions of terrestrial planets. However, most studies were limited to refractory species and did not consider volatile ones that include biogenic elements such as C and N. In this talk, we discuss two potential pathways to deliver biogenic species to terrestrial planets – one of them is the delivery from the outer region of a protostellar disk and the other is the incorporation of these species in the inner region of the disk as a result of the ice line evolution. We test these scenarios by assuming that the initial elemental abundances of embryos and planetesimals are determined by the equilibrium condensation model, and by simulating the formation of terrestrial planets. We study terrestrial planet formation under the influences of three dynamical evolution models of Jupiter and Saturn – current orbital configuration, nearly circular and coplanar configuration of the NICE model, and the inward-and-then-outward migration scenario of the Grand Tack model, and discuss the differences in their outcomes.

CONTACT (NAME ONLY): Soko Matsumura

CONTACT (E-MAIL ONLY): s.matsumura@dundee.ac.uk

AUTHORS/INSTITUTIONS: S. Matsumura, University of Dundee, Dundee, UNITED KINGDOM|R. Brasser, S. Ida, Earth-Life Science Institute, Tokyo Institute of Technology, Tokyo , JAPAN|

PRESENTATION TYPE: Oral