Magma oceans on volatile rich exoplanets: from ultra hot super-earth to temperate sub-neptunes

Sebastien Charnoz*[1], Pascal Tremblin , and Aurélien Falco

[1]UAR-Institut de physique du globe de Paris – Institut de Physique du Globe de Paris, Centre National de la Recherche Scientifique – France

Résumé

Constraining the interior of exoplanets is a very degenerated problem with many solutions. An very promising possibility is the spectroscopic studuy of planets for which the atmosphere is chemically exhange with the molten planet's mantle : these are planets with a magma ocean. Rocky exoplanets with a magma ocean at their surfacea are those with equilibrium temperature temperature $>$ 1400K. They are a new category of planets that still need to be characterized and the unambiguous detection of a magma ocean is still elusive. I will discuss about the the atmosphere of magma ocean exoplanets, and in particular the effect of Hydrogen and volatiles (water, cO2) and show spectral signatures when a magma ocean is in contact with the atmosphere. I will extend the discussion to sub-neptunes, with equilibrium temperatures $<$ 1000K , and show that they can have a magma ocean hidden under a thick atmospheric layer that may be an explantion to the high metallicities observed in some of sub-neptunes. I will discuss possibiilities to constrains magma-oceans compositios on sub-neptunes.

*Intervenant