**Radiation pressure effects on planetary exospheres and atmospheric erosion**

A. Beth (abeth@.ic.ac.uk)
Department of Physics, Imperial College London, Prince Consort Road, SW7 2AZ, UK

Many mechanisms are accountable for shaping the exosphere and driving the atmospheric escape of terrestrial planets. Nowadays, 1D-analytical models are still used to invert remote-sensing observations, such as UV stellar occultations. Amongst these models, the most commonly used, the so-called Chamberlain model (PSS, 1963) provides the neutral density profile above the exobase. It is based on a kinetic approach and takes only into account the gravity. However, additional forces are acting on neutrals though their effects on them have been poorly examined or not at all.

Radiation pressure on hydrogen has been totally ignored within modelling frameworks for terrestrial atmospheres in the solar system for the past decades. The recent discoveries of hot Jupiters, for which such an effect is important, has encouraged to assess it on solar system bodies and to improve their interpretation of remote sensing observations.

Formerly, a first attempt was made by Bishop and Chamberlain (Icarus, 1989) to assess the combined effect of the gravity and the radiation pressure on the hydrogen geocorona along the Sun-planet axis. Recently, we have extended this work to 2D, which allows to take into account the solar zenith angle dependence (Beth et al., Icarus, 2016a,b,c).

During this presentation, I will evaluate the effect of the radiation pressure on the hydrogen corona of the Earth and Mars. I will then compare my modelling output with recent observations. Finally, I will show how the radiation pressure modifies the thermal escape, the so-called Jean's escape, and triggers a "blow-off" regime with application to the solar system and beyond.