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Colloquium Pierre et Marie Curie

Mardi 6 Janvier 2015, 17 :00
IMPMC, Amphitheatre G. Charpak (Rez de Chaussée Patio 22-33 - Campus de Jussieu)
Domaines : astro-ph

Titre : *How the characterization of extrasolar planets allows to better understand the physics of planet formation*

Orateur : **Christoph Mordasini (Max Planck Institut for Astronomy)**

Résumé : *In the past few years, the research on extrasolar planets has shifted from the discovery of these objects to their physical characterization. This means that for the first time, the intrinsic luminosity, the internal structure, and the atmospheric composition of planets outside of the Solar System were measured. In my talk I will show how these observations can be used to better understand the physics of planet formation. I will address two different aspects : first, it is shown how observations of the intrinsic luminosity emitted by young giant planets constrains the physics of the accretion shock which occurs when a forming gas giant planet rapidly accretes gas from the protoplanetary nebula. Second, it is discussed how the amount of hydrogen/helium contained in an exoplanet (that can be derived from the combined measurement of the mass and radius) is an indicator of magnitude of the opacity in the atmosphere of forming protoplanet. This opacity is mainly due to micrometer sized grains that are suspended in the gas. Therefore, this observation allows to understand the dynamics of the grains like their growth and settling, which can be described with an analytical model.*