EPSC Abstracts
Vol. 13, EPSC-DPS2019-633-2, 2019
EPSC-DPS Joint Meeting 2019

EPSC
EPSC-DPS Joint Meeting 2019
15–20 September 2019 | Geneva, Switzerland

Exoplanet Characterization: linking theory & observations

Jon F. Otegi (1,2), Caroline Dorn (1), Ravit Helled (1) and François Bouchy (2)
(1) University of Zurich, Switzerland, (2) University of Geneva, Switzerland (jonfr17@gmail.com)

Abstract

Exoplanet characterisation is a challenging task. In addition to the uncertainty in the observed planets' fundamental parameters, theoretical models are limited due to the degeneracy in determining the planetary composition. We employ a full probabilistic Bayesian inference analysis in order to quantify the degeneracy of the planetary structural parameters for a large parameter space. Using this analysis, we identify what constraints can be placed on the planetary composition and internal structure, and show how the inferred structure depends on the observed mass, radius, and their uncertainties.

We also study the demographics of transiting planets with masses < 100 M_Earth, using an updated exoplanet catalog built on accurate and reliable mass and radius measurements. We propose a new empirical M-R relation based on these data, and identify trends in the M-R relation of exoplanets.

Since observational uncertainties are decreasing rapidly, the theoretical uncertainty (i.e., model assumptions) could become comparable to the observational one. We therefore also explore how various model assumptions affect the inferred M-R relation.