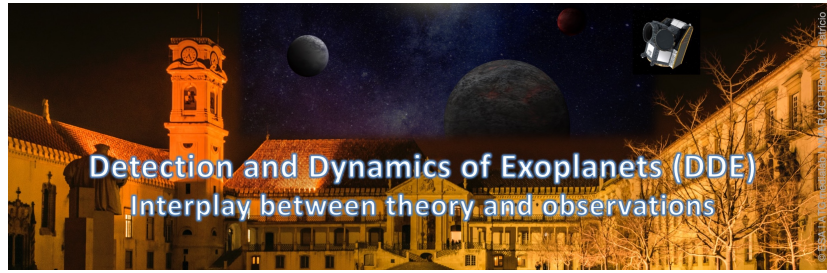


Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



Contribution ID: 84

Type: **not specified**

Accelerating Planet Formation Simulations with Emulators

Monday, July 7, 2025 2:45 PM (15 minutes)

Traditionally, characterizing the effects of different processes in planet formation has relied on performing large ensembles of simulations with slightly different initial conditions. The computational cost of planet formation simulations presents a barrier to exploring a multi-dimensional space of model parameters, characterizing the precise predictions of planet formation models, and performing inference on observed exoplanet populations. Recent progress in building emulators for complex physical models offers the hope of approximating the predictions of planet formation models at greatly reduced computational cost. When constructing an emulator, there are multiple design choices to be made, such as which parameters to use as input, which outputs to emulate, and whether to emulate specific steps of the model or only the final predictions. I'll describe recent progress in applying machine learning and emulation to planet formation models.

Presenter: FORD, Eric (Penn State)

Session Classification: Formation and evolution of planetary systems