Abstract Submitted
for the CUWIP21 Meeting of
The American Physical Society

Modeling the 3D Emission Spectra and Phase Curves of Hot Jupiter WASP-43b[1] NINA ROBBINS BLANCH, University of California, Santa Cruz, TIFFANY KATARIA, NASA Jet Propulsion Laboratory, NATASHA BATALHA, NASA Ames Research Center — We calculate 3D spectra and phase-resolved emission for the hot Jupiter WASP-43b considering atmospheric dynamics and clouds by using a suite of atmospheric codes. We first use the 3D pressure, temperature and eddy diffusion profiles from the SPARC/MITgcm, a 3D general circulation model (GCM), as inputs to Virga, a phase equilibrium code that computes the optical depth and scattering properties of condensate clouds on hot Jupiters. With Virga, we calculate 3D cloud profiles with different sedimentation efficiencies. Together, we use WASP-43b's thermal structure and cloud properties to simulate spectra using PICASO, a radiative transfer code. We also compute cloud-free spectra for testing and comparison purposes. We will build upon the framework of PICASO by developing a function that calculates a planet's phase-resolved emission (i.e., phase curves) in thermal emission. In this way, we can compare our simulated phase curves of WASP-43b to observations from Spitzer and HST. Finally, we will make predictions for future phase-curve observations of WASP-43b using JWST.

[1]Internship supported by the JPL Education Office and the Caltech Student-Faculty Programs.

Nina Robbins Blanch
University of California, Santa Cruz

Date submitted: 03 Jan 2021 Electronic form version 1.4