

2020—2021 ASTROPHYSICS SEMINAR SERIES

A Statistical Population Study of Small Planets from TESS

Recent results on the characterization of small planets have presented two questions: (1) Is there a range of super-Earth and/or sub-Neptune formation mechanisms? and (2) What is the precise and accurate planet mass-radius relation in the $<4 R_{\text{Earth}}$ regime? The Magellan-TESS Survey (MTS) is designed to address these two questions in a statistically robust, open framework that can connect observed planet distributions to true underlying populations. It will include mass constraints, host star compositions, and system architectures of 30 small planets detected by TESS across a range of insolation fluxes. Its statistical robustness arises from quantifiable and uniformly applied choices for transiting planet target selection and radial velocity observation cadencing, a new feature compared to most previous follow-up surveys. In this talk I will present the latest results from the MTS, including our hierarchical Bayesian modeling of the mass-radius relation, and discuss next steps for the survey and plans for complementary atmospheric follow-up. Overall, the MTS-style approach to population studies will become increasingly important as we move deeper into the era of exoplanet characterization where observational constraints are more technically challenging and expensive.

**Monday, April 12th**

3:30 - 4:30 p.m.

See website for Zoom details

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