

TUESDAY

OCTOBER 6

12:30 P.M.

RM 184 NSH

Origins and Demographics of Super-Earth and Sub-Neptune Sized Planets

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Sub-Neptune, super-Earth-size exoplanets are a new planet class. Though absent from the Solar System, they are found by microlensing, radial velocity, and transit surveys to be common around distant stars. The nature of planets in this regime is not known; terrestrial super-Earths, mini-Neptunes with hydrogen-helium gas layers, and water-worlds with several tens of percent water by mass are all a-priori plausible compositions. Disentangling the contributions from each of these scenarios to the population of observed planets is a critical missing link in our understanding of planet formation, evolution, and interior structure. I will review individual highlights from the diverse complement of sub-Neptune-size planets discovered to date, and present statistical analyses constraining the nature and origins of short-period rocky planets. With the suite of space-based exoplanet transit surveys on the horizon (K2, TESS, CHEOPS and PLATO) and continuing development of ground-based spectrographs, the pace of exoplanet discovery and characterization is poised to continue accelerating. I will conclude by describing pathways forward to identify bulk composition trends in the growing census of known exoplanets and to connect these composition trends back to distinct planet formation pathways.