Institut Spatial de McGill

McGill Space Institute

Seminar Series

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MIT Kavli Institute

Looking At Super-Earths Through Their Atmospheres

The Kepler mission has revealed that super-Earths (planets with radii between 1 and 4 R_{Earth}) are the most common class of planets in the galaxy, though none are known to exist in our own Solar System and little is known about how they form. These planets can theoretically have a wide range of compositions which we are just beginning to explore observationally. The relative faintness of the exoplanet host stars in the Kepler field means that atmospheric characterization with currently available instruments is extremely challenging for the majority of known super-Earths. However, a handful of transiting super-Earths are within reach of existing facilities. We have pointed the Hubble and Spitzer Space Telescopes toward these systems in an effort to paint a thorough picture of their atmospheres, with some help from ground-based facilities.

I will review the current state of knowledge for these super-Earths, and discuss how transmission and emission spectroscopy allows us to constrain their composition and formation history, as well as explore the transition region between terrestrial planets and miniature gas giants. The TESS mission will discover many more small planets transiting bright stars and amenable to follow-up observations. By probing the atmospheres of the few accessible super-Earths we know of now, we will inform the direction to be taken by future atmospheric studies of this class of exoplanets, in particular as enabled by the upcoming JWST and ELTs.

24 Jan. 3:30 pm

Bell Room (103), Rutherford Building

Refreshments following the seminar in the Physics lounge

For more information: msi.mcgill.ca/Seminars.htm