

Special Seminar
November 12, 2010, Friday
11:00am
544 Campbell Hall

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*Characterizing the Thermal Emission of Hot Jupiters
and the Spectral Features of Super-Earths in the Near-Infrared*

I will present results from our ongoing program using the Wide-field Infrared Camera (WIRCam) on the Canada-France-Hawaii Telescope (CFHT) to detect thermal emission from hot Jupiters in the near-infrared and our new program to search for spectral features in the transmission spectrum of the Super-Earth GJ 1214b . We've detected the thermal emission of several hot Jupiters in Ks-band (TrES-2b, TrES-3b, and WASP-3b) to date as well as the thermal emission of the highly irradiated exoplanet WASP-12b in the J, H and Ks-bands. These detections allow us to characterize these planets' spectral energy distributions near their blackbody peaks, and when combined with results from shorter and longer wavelengths, allow us to constrain the combination of the Bond albedo and day-to-night-side redistribution of heat in these planets atmospheres as well as their pressure-temperature profiles with depth. We are also able to answer other scientific questions such as whether hot Jupiters are stormy, and whether there is any evidence that the intriguing exoplanet WASP-12b is precessing or if there is material being tidally stripped from this planet and forming a circumstellar disk in that system? Lastly, I will present recent results from our new program to search for variations in the transit depth of the super-Earth GJ 1214b; we've detected such a variation in transit depth between the near-infrared J and Ks-bands from data observed nearly simultaneously. A spectral feature this prominent is only possible if the atmosphere of GJ 1214b has a hydrogen/helium dominated atmosphere enveloping a rocky core. If that is the case, GJ 1214b, the first super-Earth we can readily characterize, would arguably be better described as a sub-Neptune.