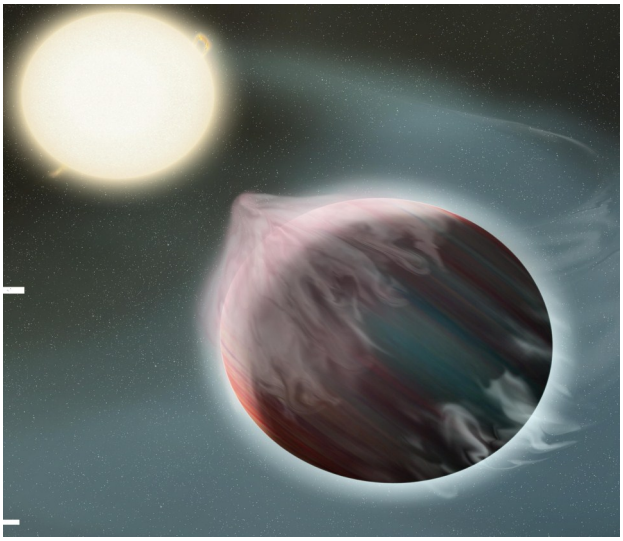
Physics & Space Sciences department presents:

The Exoplanet Revolution



The discoveries of hundreds (and perhaps thousands) of exoplanets have completely revised conventional thinking in planetary science and astrophysics. In particular, the orbital architectures of exoplanetary systems reveal an unexpected history of dynamical violence. For example, exoplanets have been discovered orbiting within only a few stellar radii of their host stars. These planets probably arose from multi-planet gravitational interactions that scattered the planets from where they formed (several AU from the star) to near their current orbits. Moreover, tidal interactions with their host stars likely cause these planets spiral into their stars in just a few billion years. As the gas giants close to their stars spiral in, the stellar tidal gravity strips their atmospheres and strands the rocky/icy cores hidden deep within their interiors in very short-period (~ few hours) orbits. Transits of these fossil cores may be seen in data from the planet-hunting Kepler mission, and characterization of this new class of planets will shed light on planet formation. Kepler data also reveal other subtle astrophysical signals that can be used to characterize planetary systems: tiny tidal oscillations (i.e. ellipsoidal variations) induced in the host stars by short-period planets can constrain planetary masses, and eclipses (as the planets are occulted by their stars) provide information on the planets' meteorology. In this presentation, I will review recent results in exoplanetary astronomy and discuss how my own research, combining theory and observation, has helped revise thinking about planet formation, evolution, and habitability.

Dr. Brian Jackson
Carnegie Dept. of Terrestrial Magnetism, Washington DC

Wednesday, February 13, 2013
4:00—5:00 PM
OPS Room 140

Students: Come meet Dr. Jackson Wednesday from 3:00 – 4:00 pm in Room 140.