Physics & Space Science Department present:

"The Grand Tack: Jupiter's migration to 1.5 AU, and how it shaped the inner solar system"

A persistent difficulty in terrestrial planet formation models is creating Mars analogs with the appropriate mass: Mars is typically an order of magnitude too large in simulations. A recent study found that a small Mars can be created if the planetesimal disk from which the planets form has an outermost edge at 1.0 AU. However, that work and no previous work, can explain such a truncation of the planetesimal disk and preserve the asteroid belt. We show that gas-driven migration of Jupiter inward to 1.5 AU, before its subsequent outward migration, can truncate the planetesimal disk and repopulate the asteroid belt. The same process that scatters material into the Asteroid Belt also sends primitive asteroids onto orbits that cross the still-forming terrestrial planets, providing a mechanism to deliver water-rich material throughout the accretion of the Earth. This dramatic migration history of Jupiter suggests that the dynamical behavior of our giant planets, characterized by dramatic radial migration, was more similar to that inferred for extra-solar planets than previously thought.

Friday, February 7th, 2014

4:00-5:00 P.M.

OPS Room 140

Dr. Kevin Walsh
Southwest Research Institute

Meet & Greet

with Dr. Walsh from 3:00-4:00 P.M. in OPS Room 140