Prospects for Unseen Planets Beyond Neptune

Abstract: Recent studies have appealed to anomalies in the orbital distribution of distant Kuiper belt objects to argue for the existence of a roughly Earth-size planet orbiting at about three times Neptune’s distance and a roughly Neptune-size planet orbiting at about twenty times Neptune’s distance. I will review the dynamical structure of the Kuiper belt and the case for the existence of such unseen planets in the distant solar system.

Bio: Renu Malhotra is Louise Foucar Marshall Science Research Professor and Regents Professor of Planetary Sciences at The University of Arizona in Tucson, where she directed the Theoretical Astrophysics Program during 2011-2016. She was born in New Delhi and grew up in Hyderabad, India. She earned her M.S. in Physics from the Indian Institute of Technology in Delhi in 1983, and her Ph.D. in Physics from Cornell University in 1988. She did post-doctoral research at Cornell and at Caltech, and worked as a staff scientist at the Lunar and Planetary Institute in Houston. Her work in planetary dynamics has spanned a wide variety of topics, including extra-solar planets and debris disks around nearby stars, the formation and evolution of the Kuiper belt and the asteroid belt, the orbital resonances amongst the moons of the giant planets, and the meteoritic bombardment history of the planets. She has revolutionized our understanding of the history of the solar system by using the orbital resonance between Pluto and Neptune to infer large-scale orbital migration of the giant planets and to predict the existence of the "Plutinos" and other small planets in resonance with Neptune. She is an elected member of the National Academy of Sciences and of the American Academy of Arts and Sciences, and has been the recipient of honors and awards from the American Astronomical Society, the International Astronomical Union, the Harvard-Smithsonian Astrophysical Observatory, Cornell University, The University of Arizona, and the IIT-Delhi.

Thursday, February 6, 2020
AME Lecture Hall, Room S212
Refreshments and socializing at 3:45 pm outside S212