CSUN | CALIFORNIA STATE UNIVERSITY NORTHRIDGE

Interdisciplinary Research Institute for the Sciences (IRIS) Seminar

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Planet formation: solving the riddle of our origins

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Abstract:
Planet formation is simultaneously one of the oldest and one of the newest concerns of human inquiry. “How did the Earth come to be?” is a question that almost invariably appears in the cosmogonies of the ancients. They not always had a clear idea of what “Earth” meant, but this is a question that, in one form or another, virtually every society in recorded history has at some point asked itself. Modern science points to a scenario where during the first million years of its infancy, the Solar System was embedded in gas (the Solar Nebula) and home to a myriad of hydrodynamical processes, which brought about turbulence. Meanwhile, microscopic dust grains embedded in the Nebula were growing larger and larger, eventually producing pebbles and rocks. Turbulence has a positive effect on these small solids, concentrating them into transient high pressure regions for long enough to achieve gravitational collapse into km-sized bodies, forming the first planetesimals. Giant storm systems in the disk, similar to Jupiter's Great Red Spot, existed in quiescent zones of the Nebula. These are even more prone to collecting solid material, producing the first terrestrial planets and cores of giant planets. In this talk I will discuss the state-of-the-art and recent advances in the field of planet formation, as well as how recent high resolution observations of Extrasolar Nebula -- the cradles of exoplanets -- taken with the Atacama Large Millimeter Array (ALMA) can help solve this ancient problem.