

**Monday, March 15, 2004**  
**ORIGIN OF PLANETARY SYSTEMS**  
**8:30 a.m. Salon C**

**Chairs: F. J. Ciesla**  
**D. S. Ebel**

- 8:30 a.m. Boss A. P. \*  
*Convective Cooling of Protoplanetary Disks and Rapid Giant Planet Formation* [#1124]  
Convective cooling is shown to be a self-consistent mechanism for cooling the midplanes of protoplanetary disks, thereby allowing disk instabilities in marginally gravitationally unstable disks to form dense clumps that could become giant planets.
- 8:45 a.m. Mosqueira I. \* Estrada P. R.  
*When Push Comes to Shove: Gap-opening, Disk Clearing and the In Situ Formation of Giant Planets* [#1432]  
In this study, we investigate the in situ formation of giant planets and its consequences for disk evolution.
- 9:00 a.m. Ouellette N. Desch S. J. \*  
*Late Injection of Radionuclides into Solar Nebula Analogs in Orion* [#2116]  
We propose a scenario in which the solar nebula acquired its short-lived radionuclides during its protoplanetary disk stage, when it resided near a supernova.
- 9:15 a.m. Haghhighipour N. \*  
*Growth of Dust Particles and Accumulation of Centimeter-sized Objects in the Vicinity of a Pressure-enhanced Region of a Solar Nebula* [#2001]  
The results of a study of the effects of gas-drag and pressure gradients on the growth of dust grains and accumulation of centimeter-sized objects in the vicinity of a local pressure maximum of a nebula are presented, and their implications for faster formation of larger bodies are discussed.
- 9:30 a.m. Love S. G. \* Pettit D. R.  
*Fast, Repeatable Clumping of Solid Particles in Microgravity* [#1119]  
In Space Station microgravity experiments, we found that mm-sized solid particles of several compositions rapidly and repeatably coalesced into durable cm-scale clumps. An analogous process, presumably electrostatic in nature, may function in the early stages of planet formation.
- 9:45 a.m. Ebel D. S. \* Joung M. K. R. Mac Low M.-M.  
*Chondrule Formation by Current Sheets in Protoplanetary Disks* [#1971]  
We numerically explore where, when and if magnetorotational instability in protoplanetary disks can produce current sheets that could form chondrules. Results are tested against astronomical, meteoritic, thermodynamic, and experimental evidence.
- 10:00 a.m. BREAK
- 10:15 a.m. Ciesla F. J. \* Laurretta D. S. Hood L. L.  
*Radial Migration of Phyllosilicates in the Solar Nebula* [#1219]  
We study the radial migration and subsequent dehydration of small phyllosilicate bodies in the solar nebula. We propose that the migration of such bodies and incorporation into planetesimals could explain the presence of water on Earth and a young Mars.

- 10:30 a.m. Weidenschilling S. J. \* Marzari F. Davis D. R.  
*Accretion of the Outer Planets: Oligarchy or Monarchy? [#1174]*  
Timescale for runaway growth is shortened if accretion is seeded by a large body in a swarm of small planetesimals. Bodies of mass  $\sim 10^{25}$  g scattered from the Jupiter-Saturn region are effective in nucleating formation of Uranus and Neptune.
- 10:45 a.m. Kortenkamp S. J. \*  
*Resonant Capture of Irregular Satellites by a Protoplanet [#1771]*  
Scattering of planetesimals by a protoplanet can trap some planetesimals in an unusual co-orbital resonance. These resonant planetesimals can have deep encounters with the protoplanet that lead to capture by, or impact with, the protoplanet.
- 11:00 a.m. Estrada P. R. \* Mosqueira I.  
*On the Final Mass of Giant Planets [#1854]*  
We investigate the factors that control the final mass of the giant planets.
- 11:15 a.m. Sharp A. G. Moses J. I. \* Friedson A. J. Fegley B. Jr. Marley M. S. Lodders K.  
*Predicting the Atmospheric Composition of Extrasolar Giant Planets [#1152]*  
We show how photochemistry and other disequilibrium processes affect the composition and chemistry of extrasolar giant planets. The results are highly sensitive to the planet's distance from its central star.
- 11:30 a.m. Zaranek S. E. \* Parmentier E. M. Elkins-Tanton L. T.  
*Overturn of Unstably Stratified Fluids: Implications for the Early Evolution of Planetary Mantles [#1642]*  
Numerical models are used to characterize the overturn of an initially unstable density stratification predicted from the fractional crystallization of a magma ocean. Results are applied to understanding subsequent evolution of planetary mantles.
- 11:45 a.m. Machida R. \* Abe Y.  
*The Evolution of an Impact-generated Partially-vaporized Circumplanetary Disk [#1719]*  
The impact-generated circumplanetary disk is a partially-vaporized one. The disk evolution is controlled by the initial gas fraction: only in the dust-rich disk, the moon formation occurs through the gravitational instability of the dust layer.