Tuesday, July 28, 2015
FORMATION OF CHONDRULES AND CHONDRITE PRECURSORS
1:30 p.m. Stanley Hall Room 105

Chairs: **Denton Ebel**
Steven Desch

1:30 p.m. Barth M. I. F. * Harries D. Langenhorst F.
Microstructural Characteristics of Polycrystalline Sulfide-Assemblages in Acfer 094 **[#5046]**
Concentric polycrystalline sulfide-assemblages in Acfer 094 provide insights into early solar system metal-gas interactions, that may have occurred under highly variable sulfide and oxide formation conditions.

1:45 p.m. Yamamoto D. * Tachibana S.
Crystallization of Amorphous Forsterite Promoted by Water Vapor **[#5247]**
We found that crystallization of amorphous forsterite is promoted in the presence of water vapor, implying that water vapor may act as a catalyst for crystallization of amorphous silicates in protoplanetary disks.

2:00 p.m. Metzler K. * Pack A.
Chondrules in LL3 Cluster Chondrites: Evidence for Interaction of Chondrule Melts with Nebular Gas **[#5118]**
Cluster chondrites probably formed by hot chondrule accretion. They show evidence for interaction of chondrule melts with surrounding gas, namely oxygen isotope exchange and chemical modification of (Type I) chondrules due to open system behaviour.

2:15 p.m. Ebert S. * Bischoff A.
Formation of Na-Rich Chondrules by Melting of Na-Rich and Condensed (Ultra)-Refractory Precursors **[#5062]**
We analyzed 33 Na-rich chondrules (Na2O >4.0 wt%) from 15 different chondrites. These chondrules must have formed by melting of precursors including Na-rich materials (like nepheline) as well as condensed (ultra)-refractory components.

2:30 p.m. Rubin A. E. * Baecker B. Wasson J. T.
Overgrowth Layers on Olivine Phenocrysts in High-FeO Semarkona Chondrules Revealed by P, Fe, and Cr X-Ray Maps: Evidence for Multiple Melting of Chondrules **[#5033]**
Olivine phenocrysts in FeO-rich chondrules exhibit multiple overgrowth layers, reflecting distinct heating events. The layers are evident in P, Fe, and Cr X-ray maps. Normal zoning in Fe, Cr, and Ca is simulated by diffusion caused by chondrule reheating.

2:45 p.m. Ebel D. S. * Crapster-Pregont E. J. Lobo A.
Hierarchical Accretion: Evidence from Compositional Diversity of CO and Ordinary Chondrite Inclusions **[#5155]**
Element abundances in chondrules in CO and LL3 chondrite show much higher variability in CO than in LL3. This supports a hierarchical accretion model and complementarity. Big LL3 chondrules could form by accretion and melting of small CO components.

3:00 p.m. Crapster-Pregont E. J. * Towbin W. H. Ebel D. S.
Insights on Chondrule Formation from Electron Backscattered Diffraction of Chondrule Metal Layers in Acfer 139 (CR2) **[#5129]**
Chondrule formation and deformation history can be derived from metal layer characteristics using EBSD and simultaneously collected EDS.

3:15 p.m. Weisberg M. K. * Ebel D. S. Kimura M.
Metal-Rich Nodules in EL3 Chondrites and Almahata Sitta EL3 Clast MS-177 **[#5312]**
Metal-rich nodules in Almahata Sitta EL3 clast MS-177 and other EL3s may be aggregates of condensates and/or phases that crystallized in a metallic (chondrule-like) melt.

3:30 p.m. Simionovici A. S. * David G. Lemelle L. Boyet M. Gillet Ph. Rivard C. El Goresy A.
Dual Energy Nano-XRF Quantification in EL-3 Fragments of the Almahata Sitta TC3 Asteroid **[#5230]**
We studied idiomorphic sinoite crystals in MS-17/177 fragments of A-S TC3 asteroid by dual energy XRF nano-imaging at ESRF (Grenoble, France), down to O/N and confirm previous findings favoring the CaS-Si_2N_2O condensation sequence scheme.

3:45 p.m. Tenner T. J. * Nakashima D. Ushikubo T. Weisberg M. K. Kita N. T.
SIMS Al-Mg Chronology of CR Chondrite Chondrules: Links with Mg# and O Isotopes **[#5325]**
When did chondrules form? / Al-Mg isotopes / Unlock the secrets.

4:00 p.m. Roth A. S. G. * Metzler K. Hofmann B. Baumgartner L. P. Leya I.
Cosmic-Ray Exposure Ages of Chondrules **[#5224]**
Chondrules might have been exposed to energetic particles prior to accretion. If so, they should show excess of cosmogenic noble gases and cosmic ray tracks relative to the rest of the meteorite. Here we report new data for tracks and exposure ages.

4:15 p.m. Grossman L. * Fedkin A. V.
Dust Enrichment: Less than Meets the Eye **[#5126]**
Massive dust enrichment of nebular regions produces oxidizing conditions at high temperature but reduction of FeO occurs upon cooling, unless the dust contains water.

4:30 p.m. Desch S. J. * Turner N. J.
High-Temperature Ionization of Dusty Gases and Implications for Chondrule Formation in Current Sheets **[#5377]**
We consider how hot nebular gas is ionized, including a new effect: thermionic emission from dust grains. We analyze how the short-circuit instability would behave. We find it difficult to initiate and not consistent with chondrule formation.

4:45 p.m. Sanders I. S. * Scott E. R. D.
Were Chondrules Made by the 'Splashing' of Molten Planetesimals? **[#5180]**
We discuss recent arguments against the idea that most chondrules were made in dense impact plumes created by low-speed collisions involving substantially molten planetesimals.

5:00 p.m. Richardson M. L. A. Morris M. A. *
Chondrule Formation from Ejecta Melts with Adaptive Mesh Refinement **[#5134]**
We discuss collisional ejecta as a progenitor of CH/CB chondrules. We present our method of mapping from Smooth Particle Hydrodynamics to Adaptive Mesh Refinement, and discuss new challenges that arise during its implementation on planetary scales.

5:15 p.m. Gaidos E. * Yin Q.-Z.
Chips Off the Old Block: Enstatite Chondrites as Samples of the Proto-Earth **[#5145]**
We link enstatite chondrites (EC) formation with the evolution of the early solar system and propose that EC formed when proto-earth material equilibrated with oxygen-poor gas from which solids of carbonaceous chondrite-like composition were removed.