Tuesday, March 13, 2007
POSTER SESSION I: EARLY SOLAR SYSTEM
6:30 p.m. Fitness Center

Miki J. Takigawa A. Tachibana S. Huss G. R.
The Birth Environment of the Solar System Inferred from a "Mixing-Fallback" Supernova Model **[#1493]**
The birth environment of the solar system was evaluated from abundances of short-lived radionuclides and a mixing-fallback supernova model. The solar system may have formed within several parsec from a massive star with >20 solar mass.

Ipatov S. I. Boss A. P. Myhill E. A.
Triggering Presolar Cloud Collapse and Injection of Short-lived Radioisotopes by a Supernova Shock Wave: Adaptive Mesh Refinement Calculations with the FLASH Code **[#1018]**
We are using the adaptive mesh refinement code FLASH in order to calculate improved hydrodynamical models of the interaction of a supernova shock wave with the presolar cloud, to learn if triggering of collapse and injection can occur simultaneously.

Ipatov S. I.
Growth of Eccentricities and Inclinations of Planetesimals Due to Their Mutual Gravitational Influence **[#1260]**
Mean eccentricities of identical gravitating planetesimals with a total mass equal to that of the Earth at diameters of 1000 km and 100 km can reach 0.1 and 0.01 in 10 million and 300 thousand revolutions of planetesimals around the Sun, respectively.

Sakamoto A. Abe Y.
The Gas Temperature in the Dissipating Solar Nebula: Effects on the Gas Capture by Planets **[#1556]**
We calculated gas temperature in the dissipating solar nebula in order to investigate influences of the dissipation of nebula gas on planets and their atmospheres.

Yasuda S. Nakamoto T. Miura H.
Three-Dimensional Thermo-Hydrodynamics Simulations: Chondrule Formation in the Shock-Wave Heating Model **[#1532]**
We have developed three-dimensional thermo-hydrodynamics simulation code to examine the destination of the chondrule precursors in the shock-wave heating model and confirmed that our code is good agreement with droplet deformation experiment.

Desch S. J. Ciesla F. J. Morris M. A.
The Effect of Line Cooling in Chondrule-forming Shocks **[#1887]**
We calculate the cooling rate of gas in chondrule-forming shocks due to emission by vibrationally excited water molecules. We find chondrules are rapidly brought to their crystallization temperatures but then cool no faster than ~ 10^2 K/hr.

Delaney J. S.
The PhotoNebula: Photochemical Effects on the Mineralogy and Petrology of Solar System Bodies and Meteorites **[#2342]**
Photochemical excitation must be considered when assessing redox processes in meteorites.

Duprat J. Tatischeff V.
Energetic Constraints on Irradiation-induced Production of Short-lived Radionuclei in the Early Solar System **[#1680]**
We computed upper limits on the *in situ* production yields of short-lived radionuclei in various irradiation scenarios. Using energetic constraints we show that, except for ^{10}Be and ^{41}Ca, irradiation cannot account for the meteoritic data.

Ikeda Y. Nagahara H. Ozawa K. Tachibana S.
Experimental Condensation of Metallic Iron at Controlled Supersaturation **[#2403]**
Condensation experiments of metallic iron were performed at 1235 K and supersaturation ratio S ~ 20–30. Estimated condensation coefficient is close to unity. This result indicates that condensation of metallic iron proceeded with an ideal rate at S > 20.

Mittlefehldt D. W. Wilson T. L.
Quantum Effects in Cosmochemistry: Complexation Energy and Van Der Waals Radii **[#2194]**
The complexation energy required for formation of endohedral carbon cages $Q@C_{60}$ is a quantum effect that may be relevant to the abundance of planetary noble gases in cosmochemistry. Its value for noble gases Q=He, Ne, Ar, Kr, and Xe is presented.

Fukui T. Kuramoto K.
Oxygen Isotopic Evolution of the Early Solar Nebula and Its Implication for Chondritic Constituents **[#1552]**
A numerical simulation of time-dependent oxygen isotopic evolution of an accreting protoplanetary disk is performed to connect the isotopic composition and chronology of chondrules and CAIs with dynamical evolution of the solar nebula.

Kita N. T. Ushikubo T. Fu B. Spicuzza M. J. Valley J. W.
Analytical Developments on Oxygen Three Isotope Analyses Using a New Generation Ion Microprobe IMS-1280 **[#1981]**
We achieved subpermil precisions on oxygen three isotope measurements for beam spots of 5–20 μm for meteorite samples. Analytical conditions, reproducibility, establishment of oxygen isotope standards and matrix correction methods are described.

Nakashima D. Ott U. Hoppe P. El Goresy A.
Search for Extinct Chlorine-36 in Vigarano CAIs **[#1109]**
Using the NanoSIMS, we have searched for ^{36}S excesses due to decay of short-lived ^{36}Cl ($T_{½}$ = 0.3 My) in sodalite from two coarse-grained Vigarano CAIs, no evidence was found.

Simon J. I. Young E. D.
Evaporation and Mg Isotope Fractionation: Model Constraints for CAIs **[#2424]**
We model the difference between the observed chemical and isotopic compositions of CAIs and the equilibrium condensation models. We use model results to make quantitative constraints on the evolution of the protoplanetary disk.

Moynier F. Yin Q.-Z. Jacobsen B.
Dating Stage-I of Planet Formation Via ^{53}Mn-^{53}Cr Chronometry **[#1401]**
We measured Cr isotopes in carbonaceous chondrites. The $^{53}Cr^*$ vs. $^{55}Mn/^{52}Cr$ trend constrains the global nebular wide Mn/Cr fractionation, chondrule formation and the Stage I planetary accretional timescale to within –0.91 to +1.17 Ma at 4568 Ma ago.

Moynier F. Yin Q.-Z. Jacobsen B.
Chromium Stable Isotope Fractionation in the Early Solar Nebula **[#1406]**
We find Cr in carbonaceous chondrites is isotopically heavier in the order CI, CM, CO, CV and CK. This trend suggests that volatility controlled isotopic fractionation in the early solar nebula and/or mixing between two isotopic distinct components.

Fujii T. Moynier F. Yin Q.-Z.
Mass-Independent Isotope Fractionation of Chromium in Ligand Exchange Reaction and Redox Reaction **[#1213]**
We conducted laboratory experiments of Cr isotope fractionation, and found the mass-independent isotope fractionation in chemical reactions. This may affect interpretations of isotopic anomalies created in the early solar nebula processes.

Jacobsen B. Yin Q.-Z. Hutcheon I. D. Phinney D. L.
Revisiting the ^{53}Mn-^{53}Cr Isotopic Systematics in Phosphates Minerals in IIIAB Iron Meteorites: Implications for the Fine Structure Constant Variation **[#1497]**
New Mn-Cr isotope data on phosphate minerals in the Grant IIIAB iron meteorite places new constraint on the uncertainty for the ^{187}Re decay constant and leads to the "fine structure constant" variations at 3.3×10^{-16}/y over the last 4.567 Ga.

Goswami J. N. Mishra R. Rudraswami N. G.
^{60}Fe and ^{26}Al Records in Chondrules from Unequilibrated Ordinary Chondrites of Low Petrologic Type **[#1943]**
A study of Al-Mg and Fe-Ni isotope systems in selected chondrules from two UOCs, Semarkona (LL3.0) and QUE 97008 (L3.05) showed resolved excess in both ^{26}Mg and ^{60}Ni and suggest that the solar system initial ^{60}Fe/^{56}Fe could be $> 10^{-6}$.

Jagoutz E. J. Jotter R. J. Kubny A. K. Varela M. V.
^{247}Cm in D'Orbigny Meteorite **[#1652]**
In two pyroxene concentrates of D'Orbigny evidence for ^{247}Cm is found: 1. excess ^{207}Pb; 2. excess ^{235}U.

Kleine T. Touboul M. Palme H. Zipfel J. Halliday A. N.
Cosmochemical Fractionation of Hf and W in the Solar Nebula: Evidence from W Isotopes in Chondrites **[#2362]**
We present new Hf-W data for bulk ordinary chondrites that constrain the timing of metal-silicate separation among the parent material of chondrite parent bodies.

Qin L. Dauphas N. Wadhwa M. Markowski A. Gallino R. Janney P. E.
Tungsten Nuclear Anomalies in Iron Meteorites and Implications for Hf-W Chronology **[#1771]**
Tungsten nuclear anomalies inherited from neutron capture processes in stars are present in IVB iron meteorites.This will impact the Hf-W chronology in these meteorites.

Touboul M. Kleine T. Bourdon B. Irving A. J. Zipfel J.
Hf-W Evidence for Rapid Accretion and Fast Cooling of the Acapulcoite Parent Body **[#2317]**
We applied the Hf-W chronometer to three acapulcoites. Our new data suggest that acapulcoites derive from a planetary body that accreted in a narrow time interval between the accretion of the parent bodies of differentiated asteroids and chondrites.

Andreasen R. Sharma M.
Decoupling of Barium and Lanthanide r-Process Nuclide Sources: Constraints on the Origin of Terrestrial ^{142}Nd Anomalies **[#2242]**
High-precision Sr and Ba isotopic compositions were obtained for Allende (CV3), Murchison (CM2), Saint Severin (LL6), and Juvinas (eucrite) to address the question of nucleosynthetic (*s*-, *r*-, *p*-process) variations in the solar nebula.

Goncharova L. A. Ivliev A. I. Kalinina G. V. Kashkarov L. L. Polukhina N. G. Rusetskii A. S. Starkov N. I. Tsarev V. A. Wladimirov M. S.
Charge Spectrum of the Cosmic Ray Heavy Nuclei Determination: (I) the First Results of the "Olympiya" Project Investigation **[#1575]**
This work is based on the solid-state track detector technique, where radiation damages produced by penetrating galactic cosmic ray (GCR) nuclei in the olivine crystals from meteorites. Preliminary results of the GCR VVH-group track-forming nuclei charge (Z) are presented.

Masarik J. Reedy R. C.
Production Rates of Cosmogenic Nuclides and Galactic-Cosmic-Ray Spectra **[#1193]**
Production rates calculated for four cosmogenic nuclides using GCR proton spectra from Castagnoli-Lal (1980) and Webber-Higbie (2003) vary by up to ~1.2 and tend to be further from unity for larger objects and depths.

Reedy R. C.
Proton Cross Sections for Producing Cosmogenic Radionuclides **[#1192]**
Cross sections as a function of energy have been compiled and evaluated for the proton reactions making ^{10}Be, ^{14}C, ^{26}Al, ^{36}Cl, ^{41}Ca, and ^{53}Mn from their main target elements.