

Thursday, March 13, 2008
SOLAR NEBULA SHAKE AND BAKE: MIXING AND ISOTOPES
8:30 a.m. Crystal Ballroom B

Chairs: **B. S. Meyer**
J. R. Lyons

- 8:30 a.m. Meyer B. S. * The L.-S. Johnson J.
Nuclear Effects of Supernova-Accelerated Cosmic Rays on Early Solar System Planetary Bodies [#2194]
 The solar system apparently formed in the neighborhood of massive stars. Supernova explosions of these stars accelerate cosmic rays to 100s of TeVs. These cosmic rays could accelerate the β decay of certain radioactive species in meteorite parent bodies.
- 8:45 a.m. Gounelle M. * Meibom A. Hennebelle P.
The Unlikely Formation of the Sun in an Orion-like Setting [#1601]
 We calculate the probability of injection of SRs by a nearby SN into a young protoplanetary disk to be of a few per mil. We simulate the formation of molecular clouds via turbulent converging flows to estimate the expected abundance of ^{60}Fe in the early solar system.
- 9:00 a.m. Young E. D. * Gounelle M. Smith R. Morris M. R. Pontoppidan K. M.
Solar System Oxygen Isotope Ratios Result from Pollution by Type II Supernovae [#1329]
 New infrared absorption measurements of oxygen isotope ratios in CO from two young stellar objects suggest that the solar system was polluted by type II supernovae ejecta from an earlier generation of star formation.
- 9:15 a.m. Boss A. P. *
Cometary Refractories, Crystalline Silicates, Short-lived Radioactivities, Stable Oxygen Isotopes, and the Solar Nebula [#1021]
 Mixing in a marginally gravitationally unstable disk can explain refractories in comets, crystalline silicates in outer disks, homogeneity of short-lived radioisotopes, and stable oxygen isotope anomalies.
- 9:30 a.m. Ciesla F. J. *
Enhancements of Water Near the Snowline: Two-Dimensional Considerations [#1046]
 I am examining the 2D dynamics of water ice and vapor in the solar nebula. I find that larger enhancements of water vapor can be achieved through the inward drift of icy bodies across the snowline than previously realized.
- 9:45 a.m. Chakraborty S. * Ahmed M. Jackson T. L. Thiemens M. H.
Experimental Test of Isotope Self-Shielding in VUV Photodissociation of CO [#1145]
 Through new oxygen isotope data from VUV photodissociation experiments, it was demonstrate that an anomalously enriched atomic oxygen reservoir is possible to generate through CO photodissociation, without requiring isotopic self-shielding.
- 10:00 a.m. Lyons J. R. * Boney E. Marcus R. A.
Self-Shielding at the X-Point in the CO E(1)-X(0) Band of CO [#2265]
 Photochemical calculations for one band of CO demonstrate that self-shielding can occur for X-point conditions, but the magnitude of the resulting isotope anomaly is significantly reduced compared to self-shielding at lower temperatures.
- 10:15 a.m. Dauphas N. * Cook D. L. Sacarabany A. Frohlich C. Davis A. M. Wadhwa M. Pourmand A. Rauscher T. Gallino R.
Iron-60 Injection in the Protosolar Nebula: How Early and How Well Mixed? [#1170]
 Iron and nickel isotopic analyses of meteorites indicate that ^{60}Fe must have been injected into the protosolar nebula and mixed at the 10% level before formation of planetary bodies.

- 10:30 a.m. Regelous M. Elliott T. * Coath C. D.
Mass Independent Ni Isotopic Variations in Chondritic and Iron Meteorites [#2479]
We report small Ni isotopic variations in chondritic and iron meteorites (<30 ppm). The range in both meteorite types largely overlap, which is counter to recent measurements but implies very low initial $^{60}\text{Fe}/^{56}\text{Fe}$ carbonaceous chondrites.
- 10:45 a.m. Upadhyay D. * Mezger K.
Nucleosynthetic and Neutron Capture-induced Sm Isotope Anomalies in Chondrites [#1262]
Sm isotopes produced by *s*- and *r* process were homogeneously distributed while those produced by the *p*-process were heterogeneously distributed in the solar nebula. This poses a challenge for the use of the ^{146}Sm - ^{142}Nd short-lived chronometer.
- 11:00 a.m. Huang S. * Humayun M.
Osmium Isotope Anomalies in Group IVB Irons: Cosmogenic or Nucleosynthetic Contributions [#1168]
We report small Os isotope anomalies in Group IVB irons that are consistent with a cosmogenic origin, not a nucleosynthetic origin, and discuss the implications.
- 11:15 a.m. Ranen M. C. * Jacobsen S. B.
Three Component Mixing in the Protoplanetary Disk: The Isotopic Evidence [#1954]
We present correlations in variations between ^{142}Nd with ^{17}O , ^{54}Cr , and ^{135}Ba among various planetary bodies including new Ba isotope measurements in a CAI. This further demonstrates incomplete mixing of the solar nebula.
- 11:30 a.m. Qin L. * Alexander C. M. O'D. Carlson R. W. Horan M.
The Distribution of Nucleosynthetic Barium and Chromium Isotope Anomalies in Meteoritic Samples [#2078]
Ba isotope in Allende (CV) indicates a small excess of *r*-process component. Allende and Murchison (CM) show excesses in ^{54}Cr , but no anomaly in ^{53}Cr . Acid residues of E-chondrites show small or no anomaly in ^{54}Cr , in contrast to C- and OC-chondrites.