

Monday, July 27, 2015
PRESOLAR GRAINS AND ISOTOPIC ANOMALIES
8:45 a.m. Stanley Hall Room 105

Chairs: Thomas Zega
 Nan Liu

- 8:45 a.m. Smith R. L. * Blake G. A. Boogert A. C. A. Pontoppidan K. M. Lockwood A. C.
[Investigating Protoplanetary Carbon Reservoirs and Molecular Inheritance Along a Galactic Gradient](#) [#5385]
 Our large suite of high-resolution observations toward massive YSOs along a Galactic gradient suggest that CO₂ may not originate from CO, and that massive YSOs may follow different evolutionary paths for carbon than their low-mass counterparts.
- 9:00 a.m. Nittler L. R. * Wang J. Liu N. Alexander C. M. O'D.
[An Extremely ¹⁷O-Rich Silica Grain from the Orgueil Meteorite](#) [#5334]
 We report a 6 × 1 μm silica grain in the Orgueil chondrite with highly enriched ¹⁷O, moderately enriched ¹⁸O, and isotopically normal Si and S. Its origin is ambiguous, but may be related to unusual silica grains previously reported in Murchison.
- 9:15 a.m. Nguyen A. N. * Keller L. P. Messenger S. Rahman Z.
[Identification of Highly Fractionated ¹⁸O-Rich Silicate Grains in the Queen Alexandra Range 99177 CR3 Chondrite](#) [#5386]
 Silicate grains with ~5% ¹⁸O enrichment are found in the QUE 99177 meteorite. TEM analysis of one grain indicates an aggregate of pyroxene grains and olivine. The grains could have formed from a fractionated ¹⁶O-poor gas reservoir.
- 9:30 a.m. Leitner J. * Hoppe P. Metzler K. Haenecour P. Floss C. Vollmer C.
[The Presolar Grain Inventory of CM Chondrites](#) [#5178]
 CM chondrites contain ~22 ppm of O-anomalous presolar grains on average. A presolar silicate/oxide ratio of 1, and an average grain size of 370 nm indicate preferential destruction of silicates and of smaller presolar grains in general.
- 9:45 a.m. Haenecour P. * Floss C. Wang A. Gyngard F. Amari S. Jadhav M.
[A Unique Presolar Graphite in the CO3.0 Chondrite LAP 031117](#) [#5006]
 We report on the first definitive in situ identification of two presolar graphite grains from the CO3.0 chondrite LAP 031117, including an extremely ¹³C-rich grain, with one of the lowest ¹²C/¹³C ratios (2.04 ± 0.02) measured in presolar graphite.
- 10:00 a.m. Meyer B. S. * Clayton D. D.
[Sizes of Carbon Grains Condensing in SNII Shells](#) [#5318]
 We compute the sizes of carbon dust grains that form in the outflows from exploding massive stars (SNII). The resulting size spectrum depends on the competition between grain seed formation and free C depletion by capture on the growing dust grains.
- 10:15 a.m. Heck P. R. Jadhav M. * Gyngard F. Busemann H. Maden C. Wieler R.
[Presolar Neon-22 in Individual Graphitic Supernova Spherules from Orgueil](#) [#5332]
 New Ne data of presolar low-density graphite from Orgueil indicates a supernova origin. We find that extensive sputtering in the NanoSIMS, e.g. for isotope analysis of trace elements, leads to gas loss due to erosion of noble gas-containing material.
- 10:30 a.m. Hoppe P. * Pignatari M. Zinner E.
[Presolar SiC X Grains with Low ²⁹Si/³⁰Si Ratios: Implications for Supernova Models](#) [#5015]
 C, N, and Si isotope data of presolar SiC X grains with low ²⁹Si/³⁰Si ratios are compared with new supernova model predictions that consider ingestion of H into the He shell before the explosion.

- 10:45 a.m. Stephan T. * Trappitsch R. Davis A. M. Pellin M. J. Rost D. Savina M. R. Jadhav M. Kelly C. H.
[Isotopic Composition of Presolar Silicon Carbide Grains Analyzed with CHILI](#) [#5257]
Twenty-two presolar SiC grains were analyzed for Sr, Zr, and Ba isotopes with the Chicago Instrument for Laser Ionization. Most grains showed isotope patterns consistent with formation in AGB star like observed previously. One grain is a supernova grain.
- 11:00 a.m. Liu N. * Nittler L. R. Wang J. Alexander C. M. O'D.
[Isotopic Analysis of Presolar SiC Grains of Possible Nova Origin](#) [#5315]
We study isotopic compositions of multielements in presolar SiC grains of possible nova origin and investigate the nucleosynthetic and mixing processes in their parent stars.
- 11:15 a.m. Lyon I. C. * Henkel T. Clarke A.
[High Spatial Resolution Isotope Ratio Imaging and 3D Reconstruction of Presolar SiC Grains](#) [#5297]
Presolar SiC grains have been analysed with a new NanoSIMS for isotope ratio measurements of C, N and Si. High spatial resolution imaging suggests that nitrogen isotope heterogeneity within the grains may lead to anomalous results in the literature.
- 11:30 a.m. Trappitsch R. * Leya I.
[Cosmogenic Production Rates in Presolar SiC Grains](#) [#5068]
We present a physical model for cosmogenic production rates and recoil losses of He, Li, and Ne isotopes in presolar SiC grains and reevaluate previous data using our new calculations.
- 11:45 a.m. Stroud R. M. * Alexander C. M. O'D.
[Heteroatom Distributions in Meteoritic Nanodiamond Residues](#) [#5302]
Single-atom sensitivity electron microscopy reveals the distribution of N, O, Si, S and other impurity atoms in nanodiamond residues.