Wednesday, March 12, 2008
EXCAVATING A COMET
1:30 p.m. Crystal Ballroom A

Chairs: **T. Stephan**
H. A. Ishii

1:30 p.m. Brownlee D. E. * Joswiak D. J. Matrajt G. Bradley J. P. Ebel D. S.
Ultra-Refractory Attogram Inclusions in Comet Dust — First Condensates? **[#1978]**
Attogram inclusions of Ti,V nitrides, and refractory metal have been found in a cometary CAI collected by Stardust. The inclusion properties are consistent with first nebular condensates from a hot region of the solar nebula with C/O ~ twice solar.

1:45 p.m. Joswiak D. J. * Brownlee D. E. Matrajt G.
Surprisingly High Abundance of Na and Ca-rich Pyroxenes in Stardust Tracks **[#2177]**
A high percentage (~50%) of 15 Stardust tracks studied contain Na- and Cr-rich high calcium pyroxenes. The Na and Cr contents of these pyroxenes are up to more than four times higher than their closest analogue pyroxenes from OC and R chondrites.

2:00 p.m. Leroux H. * Rietmeijer F. J. M. Jacob D. Roskosz M.
Evidence for Hot Chemistry Under Reduced Conditions in the Thermally Modified Stardust Samples **[#1292]**
The thermally modified samples of Stardust display evidence for chemical reactions at high T. These reactions include a redox process between ferromagnesian silicates and carbonaceous material as well as sulfur redistribution in the impact melts.

2:15 p.m. Rietmeijer F. J. M. *
Time, Temperatures, and Pressure Indicated by Metastable Iron-Sulfide Nanophases in Melted Stardust Aerogel **[#1188]**
Chemically zoned subsulfur FeS nanophases in melted aerogel have discrete deep metastable eutectic compositions. The 20 wt% S bulk composition defines pressure. Zoning developed instantaneously in the melt or <10 milliseconds between 700° and 1000°C.

2:30 p.m. Ishii H. A. * Brennan S. Bradley J. P. Pianetta P. Kearsley A. T. Burchell M. J.
Sulfur Mobilization in Stardust Impact Tracks **[#1561]**
Synchrotron XRF traverses across Stardust and analogue aerogel impact tracks show order of magnitude broader profiles for S than Fe indicating decoupling of volatile from refractory components and underreporting of S in previous abundance estimates.

2:45 p.m. Brennan S. * Ishii H. A. Pianetta P. Bradley J. P.
X-Ray Microscopy and Tomography of Stardust Terminal Particles **[#2141]**
We have used a full-field imaging X-ray microscope to image the terminal particle in a Stardust deceleration track in-silico using energies above and below the Fe K-edge to create energy-dependent tomographic reconstructions.

3:00 p.m. Nakamura T. * Noguchi T. Tsuchiyama A. Ushikubo T. Kita N. T. Valley J. W. Zolensky M. E. Kakazu Y. Sakamoto K. Mashio E. Uesugi K. Nakano T.
Mineralogy, Three Dimensional Structure, and Oxygen Isotope Ratios of Four Crystalline Particles from Comet 81P/Wild 2 **[#1695]**
The range of oxygen isotope ratios (–45 to +5 — nearly along the CCAM line) and major and minor element concentrations of silicates in the four igneous particles are very similar to those of silicates in chondrules in carbonaceous chondrites.

3:15 p.m. Stadermann F. J. * Floss C.
Abundance of Presolar Grains in Comet Wild 2 and Implications for Transport and Mixing in the Solar Nebula **[#1889]**
We have found additional oxygen-anomalous presolar grains in the cometary samples and can make comparisons with the abundances of such grains in other types of extraterrestrial materials.

3:30 p.m. Wopenka B. Matrajt G. * Bajt S. Joswiak D. J. Brownlee D. E.
Carbonaceous Phases Characterized in Two Individual Stardust Particles: FTIR and Raman Spectra of Febo and Ada **[#1827]**
Using infrared and Raman spectroscopies, we have characterized the carbonaceous phases found in two Stardust particles called Febo and Ada. We have found that the organic molecules are different in these two particles.

3:45 p.m. Pepin R. O. * Marty B. Palma R. L. Zimmermann L. Schlutter D. J. Burnard P. G. Westphal A. J. Snead C. J. Bajt S. Becker R. H. Simones J. E.
Helium and Neon in a Stardust Track Wall **[#1467]**
Materials trapped and preserved in comets date from the earliest history of the solar system. Here we present and discuss recent measurements of light noble gases carried in a particle captured from comet Wild 2 by the Stardust mission.

4:00 p.m. Schmitz S. * Brenker F. E. Vincze L. Vekemans B. Burghammer M. Riekel C.
CAI-like Fragments Detected in Wild 2 Cometary Impact Track C 2012, 110 **[#1137]**
Here we present the first results of a second candidate for a CAI-like fragment from Stardust mission material that was detected during high resolution S-XRF. We suppose that some of the mineral phases involved might be hibbonite or gehlenite.

4:15 p.m. De Gregorio B. T. * Bassim N. D. Cody G. D. Nittler L. R. Stroud R. M. Zega T. J.
TEM and STXM Observations of Organic (and Some Inorganic) Stardust Particles from Comet 81P/Wild 2 **[#2139]**
Coordinated transmission electron microscopy and scanning transmission X-ray microscopy of several Stardust particles reveal a wide variety of morphology and composition of cometary organic matter.

4:30 p.m. Stephan T. * van der Bogert C. H.
TOF-SIMS Analysis of Wild 2 Cometary Mineral Grains Captured by Stardust **[#1508]**
Compact mineral grains survive impact into Stardust aerogel as terminal particles while the more friable, fine-grained material intermingles with aerogel and stops along the tracks. For a comprehensive study, all track material has to be analyzed.

4:45 p.m. Westphal A. J. * Brownlee D. E. Fakra S. Gainsforth Z. Joswiak D. J. Marcus M. A. Snead C. J. Ogliore R. C.
Oxidation State of Iron in the Jupiter-Family Comet Wild 2 **[#2133]**
We report synchrotron-based X-ray microprobe measurements of the relative concentrations of reduced and oxidized iron in the first bona fide sample of a comet, the Jupiter-family comet Wild 2, and compare them with both meteorite groups and CP-IDPs.