Thursday, March 13, 2008
POSTER SESSION II: COMET DUST
6:30 p.m. Fitness Center

Westphal A. J. Allen C. C. Bastien R. Borg J. Brenker F. Bridges J. C. Brownlee D. E. Butterworth A. L. Floss C. Flynn G. J. Frank D. Gainsforth Z. Gruen E. Hoppe P. Kearsley A. T. Leroux H. Nittler L. R. Sandford S. A. Simionovici A. Stadermann F. J. Stroud R. M. Tsou P. Tyliczszak T. Warren J. Zolensky M. E. Stardust@home Dusters
Preliminary Examination of the Interstellar Collector of Stardust **[#1855]**
We describe the Stardust Interstellar Preliminary Examination (ISPE), which will use non-destructive, non-invasive techniques to identify and characterize candidate interstellar impacts in the Stardust aerogel and foil collectors.

Kearsley A. T. Westphal A. J. Burchell M. J. Zolensky M. E. Stardust@home Dusters
Aluminium Foils of the Stardust Interstellar Collector; the Challenge of Recognising Micrometer-sized Impact Craters Made by Interstellar Grains **[#1668]**
Preliminary Examination of Al foils from the Stardust interstellar collector will need exhaustive high resolution SEM and Auger microscopy. Craters from spacecraft ejecta should be recognised before selection of impact features for further analysis.

Butterworth A. L. Tyliszczak T. Gainsforth Z. Ogliore R. Snead C. J. Westphal A. J.
Scanning Transmission X-Ray Microscopy as a Tool for Analysis of Interstellar Dust Captured in Aerogel **[#2283]**
Non-destructive elemental mapping and characterization of interstellar dust in aerogel picokeystones.

Flynn G. J. Lanzirotti A. Sutton S. R.
Elemental Compositions of Large Cluster IDPs **[#1146]**
The enrichment of moderately-volatile elements, seen in ~10-μm IDPs, is significantly reduced in these five large, cluster IDPs, suggesting large sulfide and anhydrous silicate grains are present in the IDP parent and affect the bulk composition.

Matzel J. Dai Z. R. Teslich N. Hutcheon I. D. Weber P Bradley J. P.
Chemically and Isotopically Anomalous Presolar Interstellar GEMS? **[#2525]**
We are investigating the predicted correlation between Mg/Si and isotope anomalies by measuring the chemical and isotopic compositions of individual GEMS.

Ohsumi K. Hagiya K. Mikouchi T. Zolensky M. E.
Synchrotron X-Ray Diffraction Studies of Olivine from Comet Wild 2 **[#1808]**
We report crystal structure analyses of olivine from the coma of Comet Wild 2.

Jacob D. Stodolna J. Leroux H.
TEM Investigation of Pyroxenes Microstructure in Comet 81P/Wild 2 Terminal Particles **[#1684]**
We report a TEM examination of three terminal particles collected from the Wild 2 comet. They are coarse-grained Ca-poor pyroxenes with compositions and structures ranging from orthorhombic enstatite to monoclinic pigeonite.

Roskosz M. Watson H. C. Leroux H.
What was the Thermal History of Cometary Dust Particles During their Collect by the NASA's Stardust Spacecraft? **[#1580]**
We model the thermal history of cometary dust particules after their impact in Stardust targets based on TEM observations and concentration profiles measured at the interface between a molten MgO-rich dust and the embedding molten aerogel.

Wozniakiewicz P. J. Kearsley A. T. Burchell M. J. Bland P. A. Ishii H. A. Dai Z. R. Teslich N. Collins G. S. Bradley J. P. Russell S. S. Cole M. J. Lee M.
Constraining the Effects of Capture-Heating on Chemistry and Structure of Cometary Sulphides Under Stardust Encounter Conditions **[#1791]**
We are investigating the effect of capture-heating on iron sulphides impacted into Al foils to aid interpretation of Stardust residues. We find melting, S-loss, and recrystallisation of phases produced by target-impactor mixing.

Bridges J. C. Changela H. G. Carpenter J. D. Franchi I. A.
Iron Oxide Grains in Stardust Track 121 Grains as Evidence of Comet Wild 2 Hydrothermal Alteration **[#2193]**
Stardust Track 121 terminal grains contain Fe-oxide. These are consistent with the presence of hydrothermal alteration on the Comet Wild 2 parent body.

Foster N. J. Burchell M. J. Creighton J. A. Cole M. J.
Magnetite or Hematite? The Iron-Oxides Returned by Stardust **[#1759]**
Two Stardust samples were examined; a section of C2044,0,41 and C2005,2,121,2,0 have both shown strong Raman signals of hematite. However, the origin of this hematite is unclear and we show it may be due to heating of magnetite.

van der Bogert C. H. Stephan T.
Comparison of Capture-Melted and Unmelted Stardust Cometary Particles: Preliminary TEM Analyses **[#1732]**
Differences between capture-melted and terminal particles may result from primary differences in their structure and composition and/or from the effects of the capture process itself. We present comparative TEM analyses for both types of particles.

Rost D. Henkel T. King A. Lyon I. C.
Analysis of Organic Compounds from Stardust Samples Using C_{60}-ToF-SIMS **[#2110]**
Surfaces of flight aerogel exposed to the cometary particle flux as well as unexposed have been analyzed with latest technology ToF-SIMS, utilising a beam of 40kV C_{60} ions, most suitable to measure heavy organic compounds at high lateral resolution.

Elsila J. E. Stern J. C. Glavin D. P. Dworkin J. P.
Compound-Specific Isotope Analysis of Amino Acids for Stardust-returned Samples **[#2004]**
Analysis of Stardust-returned samples has revealed the presence of amines and amino acids, but their origin is undetermined. We report progress towards the compound-specific isotope analysis of these amino acids to determine if they are cometary.

Greenberg M. Ebel D. S.
Nondestructive 3D Confocal Laser Imaging of Stardust Tracks in Aerogel and Deconvolution Techniques **[#1800]**
We present greatly improved Laser Confocal Scanning Microscopy (LCSM) and deconvolution methods for nondestructive 3D imaging of whole Stardust tracks and subregions. LCSM resolution of 70 nm/pixel edge is shown, and 40 nm/pixel edge is possible.

Jones S. M. Flynn G. J. Frank D. Westphal A. J.
Non-Silicate Aerogels as a Next Generation Hypervelocity Particle Capture Material **[#1445]**
The results presented indicate that non-silicate aerogels could be used in conjunction with silicate aerogel to increase the science return of future Stardust-like sample capture and return missions.

Lisse C. M. Cheng A. F. Chabot N. L. Dello Russo N. Satcher J. H. Zolensky M. E. Cintala M. J. Glavin D. P. Sandford S. A.
Development of Improved Aerogels for Spacecraft Hypervelocity Capture **[#2298]**
We report on progress to date of an aerogel technology development and test program, to develop improved aerogel capture media for spacecraft capture of dust particles, utilizing silica, tantala, and alumina based aerogels with lower densities and organic impurity levels.

Cook D. L. Emge T. Herzog G. F. Flynn G. J. Lanzirotti A. Sutton S. R.
XRD Analyses of Small Grains Using Synchrotron Radiation: Potential Application to Samples Returned by Stardust **[#2483]**
We used synchrotron radiation to perform XRD analysis on small grains of San Carlos olivine and samples of Murchison and Tagish Lake that had been pressed into indium foil. The effects of foils of varying thickness were also investigated.

Dai Z. R. Bradley J. P. Jiang B. Teslich N.
The First 300 keV Double Cs-Corrected and Monochromated SuperSTEM: Applications in Minerals and Extraterrestrial Materials **[#2223]**
A FEI high-base Titan 80–300 (scanning) transmission electron microscope (S/TEM)has been installed at LLNL. It is the first 300 kV analytical superSTEM that combines double Cs correctors and monochromator in one. Some preliminary results will be shown.

Lederer S. M. Cintala M. J. Olney R. D. Keller L. P. Nakamura-Messenger K. Zolensky M. E.
Collisional Processing of Olivine and Pyroxene in Cometary Dust **[#2316]**
Laboratory impacts into olivine and pyroxene targets show that detectable infrared spectral changes result from collisions below 3 km/s. Telescopic spectra of cometary dust thus could shed light on the collisional histories of cometary nuclei.