

Wednesday, March 19, 2003
IDPs: FROM COMETS AND ASTEROIDS TO AEROGEL
1:30 p.m. Salon A

Chairs: A. J. Westphal
M. Landgraf

Rietmeijer F. J. M. * Pfeffer M. A. Chizmadia L. Macy B. Fischer T. P. Zolensky M. E.
 Warren J. L. Jenniskens P.

Leonid Dust Spheres Captured During the 2002 Storm? [#1358]

We present chemical analyses of small spheres collected in the lower stratosphere during a narrow window of opportunity at the time of the November 2002 Leonid Meteor Storm. We discuss extreme kinetic fractionation for the compositions of this deeply penetrated comet debris.

Landgraf M. * Krueger H. Altobelli N. Gruen E.

Transparency of the Inner Heliosphere to the Interstellar Dust Stream During Solar Maximum: Ulysses Measurements and Modelling [#1306]

The Ulysses dust detector has detected an increased flux of interstellar dust grains since early 2000. This elevated flux is observed up to the most recent data end-2002. Only relatively small dust grains with high charge to mass ratios can explain the observations.

Floss C. * Stadermann F. J.

Complementary Carbon, Nitrogen and Oxygen Isotopic Imaging of Interplanetary Dust Particles: Presolar Grains and an Indication of a Carbon Isotopic Anomaly [#1238]

We report NanoSIMS measurements of C, N and O isotopes in two unusual IDPs. Both have bulk enrichments of ^{15}N , as well as ^{15}N hotspots. One of these hotspots is, furthermore, depleted in ^{13}C . Each IDP also contains a ^{17}O -rich presolar grain.

Dai Z. R. * Bradley J. P. Brownlee D. E. Joswiak D. J.

The Petrography of Meteoritic Nano-Diamonds [#1121]

The carrier of nano-diamonds in thin-sections of meteorites and interplanetary dust particles (IDPs) is a disordered (amorphous) carbonaceous material, suggesting that nano-diamonds are associated with an (amorphous) organic carrier rather than a (graphitic) inorganic carrier.

Stephan T. * Leitner J. Floss C. Stadermann F. J.

TOF-SIMS Analysis of Isotopically Anomalous Phases in Interplanetary Dust and Renazzo [#1343]

We used TOF-SIMS to identify carriers of D and ^{15}N in one IDP and in Renazzo matrix. Organic material closely connected to Mg-rich, Fe-poor anhydrous minerals seems to be the most plausible carrier of isotopically anomalous matter in these samples.

Mukhopadhyay S. * Nittler L. R.

D-rich Water in Interplanetary Dust Particles [#1941]

We have investigated the carrier phase(s) of D excesses in IDPs and report the first positive identification of a D-rich hotspot that is not associated with organic matter.

Aléon J. * Arpigny C. Robert F. Jehin E. Manfroid J. Hutsemékers D. Zucconi J.-M. Schulz R.
 Stüwe J. A. Sangély L. Chaussidon M. Marty B. Engrand C.

Cometary Organic Macromolecules in Interplanetary Dust Particles? [#1308]

Based on the determination of N concentrations in D-rich molecules in IDPs and new $^{14}\text{N}/^{15}\text{N}$ ratios in comets, it is proposed here that organic chemistry of IDPs may provide a direct link with comets.

Flynn G. J. * Keller L. P. Wirick S. Jacobsen C.

A Preliminary Assessment of the Organic Content of Interplanetary Dust Particles [#1652]

We compared the strength of the C = O absorption in IDPs with that in Murchison residue and the aliphatic C-H₂ absorption to that in a 1% paraffin and 99% clay mixture. On average, anhydrous and hydrated IDPs have percent-level aliphatic and carbonyl.

Westphal A. J. * Snead C. Dominguez G. Bradley J. P. Zolensky M. E. Flynn G. Brownlee D.

An Extraction and Curation Technique for Particles Captured in Aerogel Collectors [#1826]

We present a technique for curation of particles captured in aerogel which will preserve the entire particle track, and will allow for elemental analysis the terminal particle residue and any particle residues located along the track.

Engrand C. * Gounelle M. Zolensky M. E. Duprat J.

About Tagish Lake as a Potential Parent Body for Polar Micrometeorites ; Clues from Their Hydrogen Isotopic Compositions [#1688]

It was suggested that Tagish Lake could represent the parent body of Antarctic micrometeorites (AMMs). We measured their hydrogen isotopic compositions and our results suggest that this meteorite and the AMMs could not derive from the same parent body.

Toppani A. Marty B. * Zimmermann L. Libourel G.

Simulation of Nitrogen and Noble Gases Release During Atmospheric Entry of Micrometeorites [#2028]

In order to evaluate the delivery of extraterrestrial volatiles to the Earth atmosphere by micrometeorites, noble gases and nitrogen were analysed in a set of flash-heated Orgueil material.

Genge M. J. *

Primary Variations in Micrometeorites with Entry Velocity [#1151]

Certain petrological features of micrometeorites can be used to correlate entry heating effects between different particle types allowing their distribution with entry velocity to be analysed.

Keller L. P. * Flynn G. J.

Far-IR Spectroscopy of Interplanetary Dust, Circumstellar Silicate Analogs, and Aerogel: A Prelude to Stardust Samples [#1903]

Far-IR spectra of IDPs show absorption features from crystalline silicates similar to those observed in spectra of comets and young stars by the Infrared Space Observatory. We also demonstrate the application of far-IR spectroscopy to the non-destructive, *in situ*, analysis of particles in aerogel.