Thursday, March 10, 2011
POSTER SESSION II: PRIMITIVE METEORITES II:
CARBONACEOUS CHONDRITES AND NEW MINERALS
6:00 p.m. Town Center Exhibit Area

Nakato A. Nakamura T. Noguchi T. Ahn I. Lee J. I.
The Thermal Evolution of the Primitive Hydrous Asteroids recorded in Dehydrated Carbonaceous Chondrites **[#1725]**
We studied about 40 carbonaceous chondrites to understand the variety of thermal evolution in the primitive asteroids. Based on our results, degree of heating and aqueous alteration vary among chondrites reflected a wide variation of dehydrated asteroids.

Ostrowski D. R. Sears D. W. G.
Comparison of Spherules of Heated Phyllosilicate-Evaporite Mixtures to Spherules in CI and CR Chondrites **[#1209]**
Spherules have been generated in lab samples for asteroid spectral comparison that is studied for similarities to the spherules in CI and CR chondrites. Lab spherules are hollow and are more similar to rounded voids in the carbonaceous chondrites.

Gyollai I. Nagy Sz. Bérczi Sz. Gucsik A.
Comparison of Aqueous Alteration of Two CV3 (Kaba and Yamato-86751) Chondrites **[#1039]**
The Kaba meteorite has more pervasive aqueous alteration inside their chondrules; the Y-86751 CV3 chondrite has more altered matrix with flow structure, but much better preserved chondrules.

Dunn T. L.
Nickel Abundance of Olivine and Magnetite in CV and CK Chondrites: Evidence for a Continuous Metamorphic Sequence? **[#2043]**
We examine the suggestion that the CK and CV chondrites were derived from a single, thermally stratified asteroid by using NiO content in magnetite to look for a continuous metamorphic sequence between the two groups.

Runyon S. E. Dunn T. L.
Using Magnetite Compositions to Examine a Possible Genetic Relationship Between the CV and CK Chondrites **[#2114]**
Magnetite compositions of equilibrated CK 4–6 chondrites, unequilibrated CK3 chondrites and CV chondrites are evaluated as indicators of a possible genetic link between CV chondrites and CK chondrites.

Isa M. Shirai N. Ebihara M. Kubuki S. Yamaguchi A.
Chemical Characteristics for CK Carbonaceous Chondrite **[#1876]**
Bulk chemical compositions for 16 CK chondrites were determined. Based on their chemical compositions, we discuss about relationship among CK, CV and CO and thermal metamorphism on CK chondrites.

Chaumard N. Devouard B. Zanda B. Devidal J.-L.
Metamorphosed Calcium-Aluminum-Rich Inclusions in the Tanezrouft 057 CK4 Carbonaceous Chondrite **[#1924]**
CAIs in TNZ 057, a CK4 chondrite, are abundant (ca. 9.1 area%) and show evidence of modification by successive nebular and parent body (mainly metamorphic) processes. These observations confirm the close relationship between CV and CK chondrites.

Maldonado E. M. Brearley A. J.
Exsolution Textures in Pyrrhotite and Alteration of Pyrrhotite and Pentlandite in the CM2 Chondrites Crescent, Mighei and ALH 81002 **[#2271]**
Coarse-grained pyrrhotite-pentlandite grains in CM2 chondrites show a variety of exsolution textures formed during cooling. They also exhibit evidence of secondary replacement.

Bartoschewitz R. Ott U. Herrmann S.
Noble Gas Record of the Anomalous CM Dhofar 1434 **[#1661]**
Noble gases of the anomalous CM chondrite Dho1434 were analyzed. The results are presented in view of cosmic ray exposure age, gas retension age, and abundance of presolar phases.

Ireland T. J. Dauphas N.
Characterization of the Rare Earth Elements in Murchison Leachates: Relative Abundances and Future Prospects **[#1530]**
We present rare earth element (REE) data for six leachates from the Murchison CM2 chondrite, and present some preliminary experimental data for separating the REE from each other using Ln-resin (HDEHP).

Zolensky M. Frank D. Le L.
Olivine and Pyroxene Compositions in Fine-Grained Chondritic Materials **[#1898]**
We report new analyses of olivine and low-Ca pyroxene in Wild 2 grains and matrix in chondritic meteorites.

Blinova A. Zega T. J. Herd C. D. K. Stroud R. M.
A TEM Study of Pristine Matrix from the Tagish Lake Meteorite **[#2517]**
This is a continuation of work on the mineralogy and petrology of prominent variations in pristine samples of the Tagish Lake meteorite. Here we present TEM observations of pristine matrix in these specimens.

Bunch T. E. Irving A. J. Wittke J. H. Rumble D. III Hupé G.
Petrology and Extreme Oxygen Isotopic Composition of Type 3.00 Carbonaceous Chondrite Northwest Africa 5958: A Unique, Primitive, ^{16}O-Rich Early Solar System Sample **[#2343]**
We describe a highly unequilibrated, ungrouped carbonaceous chondrite with bulk oxygen isotopic composition one-sixth of the way toward the solar value.

Ireland T. R. Law P. Zolensky M.
Micro-Scale Distributions of Major and Trace Elements in Chondrites **[#1623]**
The returned Itokawa samples will be compared to chondrites. But we need a lot more information at the scale of the grains for comparison. Chondrite matrices are examined for scale of homogeneity and composition.

Ash R. D. Walker R. J. Puchtel I. S. McDonough W. F. Irving A. J.
The Trace Element Chemistry of Northwest Africa 5958, a Curious Primitive Carbonaceous Chondrite **[#2325]**
NWA 5958 is a primitive, carbon-rich carbonaceous chondrite which exhibits refractory and volatile trace element chemistry indistinguishable from CI chondrite, but whose oxygen isotopic composition suggests it has not seen hydrous alteration.

Gucsik A. Endo T. Nakazato E. Nishido H. Ninagawa K. Kayama M. Bérczi Sz. Nagy Sz. Ábrahám P. Kimura Y. Gyollai I. Simonia I. Rózsa P. Posta J. Nagy M. Mihályi K. Apai D. Futó P.
Cathodoluminescence Characterization of the Forsterite in Kaba Meteorite: An Astromineralogical Application **[#1157]**
A combined CL and SEM study implies that the aqueous alteration on the Kaba forsterite might eliminate intrinsic structural defects progressively from the rim of the grain to the core, accompanied by the migration of diffusible ions of Mn, Cr, and Fe to the rim.

Nakamura-Messenger K. Clemett S. J. Rubin A. E. Choi B.-G. Zhang S. Rahman Z. Oikawa K. Keller L. P.
New Titanium Monosulfide Mineral Phase in Yamato 691 Enstatite Chondrite **[#1407]**
Here we report a new mineral from Yamato 691 (EH3), ideally stoichiometric Ti1S1, a simple two-element mineral phase, yet with a very unique crystal structure that has not been observed previously in nature.

Ma C. Tschauner O. Beckett J. R. Kiefer B. Rossman G. R. Liu W.
Discovery of Panguite, a New Ultra-Refractory Titania Mineral in Allende **[#1276]**
We report here the discovery of panguite (Ti^{4+},Al,Sc,Mg,Zr,Ca)1.8O3, a new titania mineral in Allende, and discuss implications of this phase for processes very early in the history of our solar system.

Guan Y. Bindi L. Eiler J. M. Hollister L. MacPherson G. J. Steinhardt P. J. Yao N.
Oxygen Isotope Evidence for the Extra-terrestrial Origin of the First Natural Quasicrystal **[#2648]**
SIMS oxygen-isotopic data indicate that the first naturally occurring quasicrystal is associated with a diverse assemblage of high-temperature refractory chondritic minerals (silicates and oxides) formed in the early solar system.

Riedo A. Fernandes V. A. S. M. Yakovleva M. Tulej M. Wurz P.
A Miniaturized Laser Ablation Mass Spectrometer for Space Research **[#1880]**
In this abstract we present current performance of our miniaturized Laser Ablation Time-of-Flight Mass Spectrometer (LMS) to be used for *in situ* planetary missions and laboratory elemental and isotopic analyzes.

Henkel T. Wong R. Longobardo A. Lockyer N.
Advances in the Analysis of Tiny Samples like Presolar Grains **[#2305]**
Every atom counts when analyzing tiny samples. Using femtosecond lasers for post-ionization of sputtered neutrals simplifies and improves elemental quantification and has the potential to boost the efficiency with which the samples are analysed.

Getty S. A. Brinckerhoff W. B. Cornish T. J. Merrill Floyd M. A. Ecelberger S. A. Callahan M. P. McAdam A. Elsila J. E. Eigenbrode J. L. Arevalo R. D.
Miniature Two-Step Laser TOF Mass Spectrometer with Reversible Ion Polarity **[#2490]**
We present details of the initial development of a two-step laser TOF mass spectrometer (L2MS) for enhanced *in situ* analysis of planetary samples for particular classes of organic compounds.

Klingelhöfer G. Morris R. V. Blumers M. Bernhardt B. Graff T.
The 2010 ILSO-ISRU Field Test at Mauna Kea, Hawai'i: Results from the Miniaturized Mössbauer Spectrometers MIMOS II and MIMOS IIA **[#2810]**
The 2010 ILSO-ISRU Moon analogue field test on the Mauna Kea volcano in Hawai'i was coordinated by NORCAT in collaboration with the Canadian Space Agency, the German Aerospace Center, and NASA.

Alp E. E. Yan L. Cramer S. P. Zhao J. Y. Toellner T. S. Friedrich J. M. Boesenberg J. Alsmadi A. Sturhahn W.
A Mössbauer Microscope for Mineralogy in the Synchrotron Age **[#1911]**
We demonstrate a new microscope that has unique sensitivity to iron containing meteorites and minerals, using Mössbauer effect, with a resolution of a few micrometers.

Shanmugam M. Acharya Y. B. Goyal S. K. Murty S. V. S.
Alpha Particle X-Ray Spectrometer (APXS) On-Board Chandrayaan-2 Rover **[#1232]**
Alpha Particle X-ray Spectrometer (APXS) for ISRO's Chandrayaan-2 rover, slated for launch in 2013.

Kobayashi M. Miyachi T. Nakamura M. H.
Cosmic Dust Detector Capable of Measuring Hypervelocity Speed Using Piezoelectric PZT **[#2389]**
We propose a cosmic dust detector capable of measuring hypervelocity speed (higher than about 7 km/s) using Piezoelectric PZT. The dust detector can observe the momentum and the speed and as a result the mass can be also derived.

Horanyi M. Sternovsky Z. Gruen E. Kempf S. Srama R. Postberg F.
LDEX+: Lunar Dust Experiment with Chemical Analysis Capability to Search for Water **[#1656]**
The LDEX+ instrument extends the capabilities of the currently developed Lunar Dust Experiment (LDEX) of the upcoming Lunar Atmosphere and Dust Environment Explorer (LADEE) mission to measure the chemical composition of the impacting particles in addition to their mass.

Clark P. E. Dunlop D.
SPACE (Surface Payloads and Advanced Concepts for Exploration) Open Access Database/Spreadsheet Tool and Working Group **[#1112]**
An extensive open–source spreadsheet representing design, development history, applications, require-ments, and operating characteristics of potential pay-loads and advanced concepts to support a broad range of applications is being made available.

Clark P. E. Millar P. S. Yeh P. S. Beaman B. Brigham D. Feng S.
Instrument Packages for Cold, Dark, High Radiation Environments **[#1111]**
We are developing a small cold temperature in-strument package concept that integrates cold tempera-ture power system and radhard ULT ULP electronics into a 'cold temperature surface operational' version of a planetary surface instrument package.

Grimm R. E. Stillman D. E.
Progress in Prospecting for Near-Surface H_2O on the Moon and Mars with Dielectric Spectroscopy **[#2550]**
A broadband relaxation is the principal low-frequency dielectric signature of low-abundance H_2O.

Miller R. S. Souza A. N. Lawrence D. J. Bussey B. J.
Hydrogen at the Lunar Poles: Search Strategies and Tradeoffs for a Surface-Based Neutron Spectrometer **[#2002]**
We report initial results of performance and survey strategies for a neutron telescope capable of addressing the lunar-polar hydrogen exploration challenge.

Hardgrove C. J. Moersch J. E.
Geochemical Effects on Neutron Die-Away: Implications for the Mars Science Laboratory Dynamic Albedo of Neutrons Experiment **[#2135]**
We have shown that strong reductions in the total number of thermal neutrons as well as shifts in arrival times may allow DAN, on-board the MSL rover Curiosity, to detect evaporitic Cl-rich deposits, Fe concretions or hydrothermal Si-rich materials.

Peplowski P. N. Hepplewhite P. D. Feldman W. C. Lawrence D. J. Hibbitts C. A.
Considerations for the Operation of a ^{3}He Proportional Counter in the Ganymede Radiation Environment **[#1481]**
Simulations of the response of a neutron spectrometer in the Ganymede radiation environment are presented. The results are used to identify instrument modifications required as well as to quantify its ability to map water ice deposits on the surface during the JGO mission.

Parsons A. Bodnarik J. Burger D. Evans L. Floyd S. Lim L. McClanahan T. Namkung M. Nowicki S. Schweitzer J. Starr R. Trombka J.
Planetary Geochemistry Techniques: Probing In-Situ with Neutron and Gamma Rays (PING) Instrument **[#2379]**
The Probing *in situ* with Neutrons and Gamma rays (PING) instrument uses a pulsed neutron generator and neutron and gamma-ray detectors to measure the surface and subsurface elemental composition of planetary bodies without the need for drilling.

Mokrousov M. I. Mitrofanov I. G. Kozyrev A. S. Litvak M. L. Malakhov A. V. Sanin A. B. Tretyakov V. Vostrukhin A. Golovin D. Varenikov A.
Nuclear Instruments for Planetary Science **[#1782]**
The discussion about neutron and gamma spectrometry instruments is presented.

Kobayashi S. Mitani T. Takashima T. Karouji Y. Hasebe N.
The Lunar Geochemical Analysis by a Gamma-Ray Spectrometer for Next Lunar Explorations **[#1721]**
The sensitivity of a gamma-ray spectrometer using a LaBr3 detector has been estimated for the geochemical analysis (K, Th, U) of the central peak of a crater on the Moon. This study is for a future lunar mission to explore Procellarum KREEP Terrain.

Reedy R. C.
Background Peaks in Bismuth Germanate: Nuclear Reactions with Bismuth **[#2317]**
Cross sections for nuclear reactions of neutrons and protons with Bi were evaluated and used to estimate relative production rates in BGO detectors in space. The largest production is by (n,x) reactions. High-energy reactions can make many nuclides.

Ciarletti V. Clifford S. Vieau A. J. Lustrement B. Hassen Khodja R. Cais P.
Results from the First Field Tests of the WISDOM GPR (2018 ExoMars Mission) **[#2613]**
Results from the first field tests of the WISDOM GPR (2018 ExoMars Mission) on Mount Etna.

Hill K. S. Hansford G. M. Vernon D. Talboys D. L. Ambrosi R. M. Bridges J. C. Hutchinson I. B.
The Mars-XRD Instrument for ExoMars: Combined X-Ray Diffraction and Fluorescence Measurements **[#2107]**
Mars-XRD is a combined X-ray diffractometer and fluorescence spectrometer to analyse the mineralogy and chemical composition of Mars. We present our initial investigation into its ability to identify minerals under representative conditions.

Sarrazin P. Taylor G. J. Blake D. Vaniman D. Bish D.
XTRA: Extraterrestrial Regolith Analyzer **[#2280]**
XTRA is an XRD/XRF instrument for mineralogiocal analysis of regolith on air-less bodies. Very compact and light weight, it will be suitable for missions to the Moon, Mercury, or asteroids on landers fitted with basic sample acquisition capabilities.

Young K. E. Evans C. Allen C. Mosie A. Hodges K. V.
In-Situ XRF Measurements in Lunar Surface Exploration Using Apollo Samples as a Standard **[#2121]**
We present handheld XRF data on 22 Apollo samples. We also discuss the development of 3 different deployment modes for this instrument.

Allwood A. C. Wade L. A. Hodyss R.
Micro-XRF: Fast, High Spatial Resolution Analysis of Rock and Soil Elemental Chemistry In Situ **[#2725]**
We are developing a Micro-XRF instrument for high-resolution measurements of rock chemistry, which will provide crucial information about the relationship of composition to texture.

Speicher E. A. Dyar M. D. Gunter M. E. Lanzirotti A. Tucker J. M. Peel S. E.
Brown E. B. Delaney J. S.
Synchrotron Micro-XANES Analysis of Fe^{3+} in Oriented Amphiboles **[#2287]**
Micro-XANES was performed for iron analysis on oriented amphibole crystals with the X-ray beam polarized along the X, Y, and Z optical directions. Results provide Fe^{3+} calibration curves useful for data acquisition on oriented amphibole grains in thin sections.

Okada T.
Calibration Method Using a Solar X-Ray Monitor with a Standard Sample for Planetary Remote X-Ray Spectroscopy **[#1703]**
Planetary remote XRF spectroscopy should provide major elemental composition as precisely as possible. Uncertainty of solar X-ray monitoring is a crucial topic on this, and we propose onboard calibration method with a standard sample.

Okada T. Fukuhara T. Nakamura R. Sekiguchi T. Hasegawa S. Kitazato K. Taguchi M.
Imamura T. Hayabusa-2 Mid-Infrared Imager Team
Mid-Infrared Imager for Mapping Thermal Emission off the Surface of Near-Earth Asteroid 1999JU3 in Hayabusa-2 **[#1370]**
A mid-infrared imager is being prepared for Hayabusa-2 to map thermal emission off the surface of a C-class near-Earth asteroid 1999JU3 and investigate surface physical properties with an assessment for landing site selection.

Cloutis E. A. Hipkin V. J. Wennberg P. O. Wolff M. J. Stromberg J. M. Berard G. M. Mann P. MATMOS Team
ExoMars Trace Gas Orbiter MATMOS Instrument: Preliminary Strategy for Development of a Dust Spectral Library **[#1175]**
A library of spectral dust signatures, utilizing long path IR transmission, dust-covered IR transparent disks, and modeling of reflectance spectra, is being developed in support of data analysis for the 2016 ExoMars Trace Gas Orbiter MATMOS solar occultation FTIR instrument.

Pilorget C. Bibring J.-P. Berthe M.
MicrOmega: An IR Hyperspectral Microscope for the Phobos Grunt Lander **[#1930]**
MicrOmega IR is an ultra miniaturized near-infrared hyperspectral microscope dedicated to *in situ* analyses that has been developed in the framework of the Exomars mission. A demonstrator will be embarked on the Phobos Grunt mission.

Lucey P. G. Crites S. T.
Thermal Infrared Imaging Interferometer Performance for Planetary Applications **[#1335]**
Performance models of imaging interferometers using both cooled and uncooled arrays are tested against measurements to enable assessment for planetary applications.

Maturilli A. Helbert J. D'Amore M.
An Overview of the Planetary Emissivity Laboratory (PEL) at DLR in Berlin **[#1693]**
In the Planetary Emissivity Laboratory (PEL) at DLR we measure emissivity at high T under vacuum, low/moderate T under purging, bi-directional reflectance and transmission at room T under vacuum or purging, of planetary analogue materials from VIS to FIR.

Helbert J. Maturilli A.
Laboratory Emission Spectra at 500°C at the Planetary Emissivity Laboratory at DLR in Berlin — Challenges, Challenges and even more Challenges… **[#1794]**
For the last four years we are upgrading the Planetary Emissivity Laboratory at DLR in Berlin to obtain emissivity spectra at temperatures realistic for Mercury and Venus. Here we report about the challenges encountered in this effort.