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On behalf of the Meteoritical Society, we would like to thank the organizations whose generous sponsorships provided student travel grants, Postdoc travel grants and travel grants for scientists from countries with limited financial resources. These sponsoring organizations, and the recipients of the travel awards, are listed below.

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- If your institution participates in eduroam, you are able to connect securely with your eduroam ID and Wi-Fi key from your home institution. Please visit eduroam.org to see if your home institution offers this service.
- CalVisitor requires no username or password. Self-select the CalVisitor Wi-Fi network to get online.

Meeting Calendar

Sunday, July 26

12:00 p.m.	Foothill Recreation Room	Council Meeting
3:00 p.m.	Stanley Hall Atrium	Registration
6:00 p.m.	Haas School of Business, Auditorium	Opening Ceremony
6:30 p.m.	Haas School of Business, Bank of America Forum	Welcome Reception

Monday, July 27

8:30 a.m.	Stanley Hall Rm 105	Formal Opening
8:45 a.m.	Stanley Hall Rm 105	Presolar Grains and Isotopic Anomalies
8:45 a.m.	Sibley Auditorium	Developments in Advanced Techniques for Meteorite and Returned Sample Analysis
10:15 a.m.	Sibley Auditorium	Impact Cratering Processes: Glasses and Melts
1:30 p.m.	Stanley Hall Rm 105	Early Solar System Chronology — A Tribute Dedicated to Ian Hutcheon
1:30 p.m.	Sibley Auditorium	Impact Cratering Processes: Shattering, Shocking, Bombarding
7:30 p.m.	International House (I-House), Chevron Auditorium	Barringer Invitational Lecture

Tuesday, July 28

8:30 a.m.	Stanley Hall Rm 105	CAIs and Other Refractory Materials
8:30 a.m.	Sibley Auditorium	Asteroids and Comets: Remote Observations
10:15 a.m.	Sibley Auditorium	Isotopic, Chemical, and Experimental Studies of Lunar Samples
1:30 p.m.	Stanley Hall Rm 105	Formation of Chondrules and Chondrite Precursors
1:30 p.m.	Sibley Auditorium	Exposure History and Delivery of Meteorites from Asteroids, Mars, and the Moon, from Falls, Finds, and Recoveries
6:00 p.m.	HMMB Floors One, Two and Three	Poster Session

Wednesday, July 29

8:30 a.m.	I-House, Chevron Auditorium	Award Presentations and Award Talks
7:00 p.m.	The Campanile	Annual Banquet

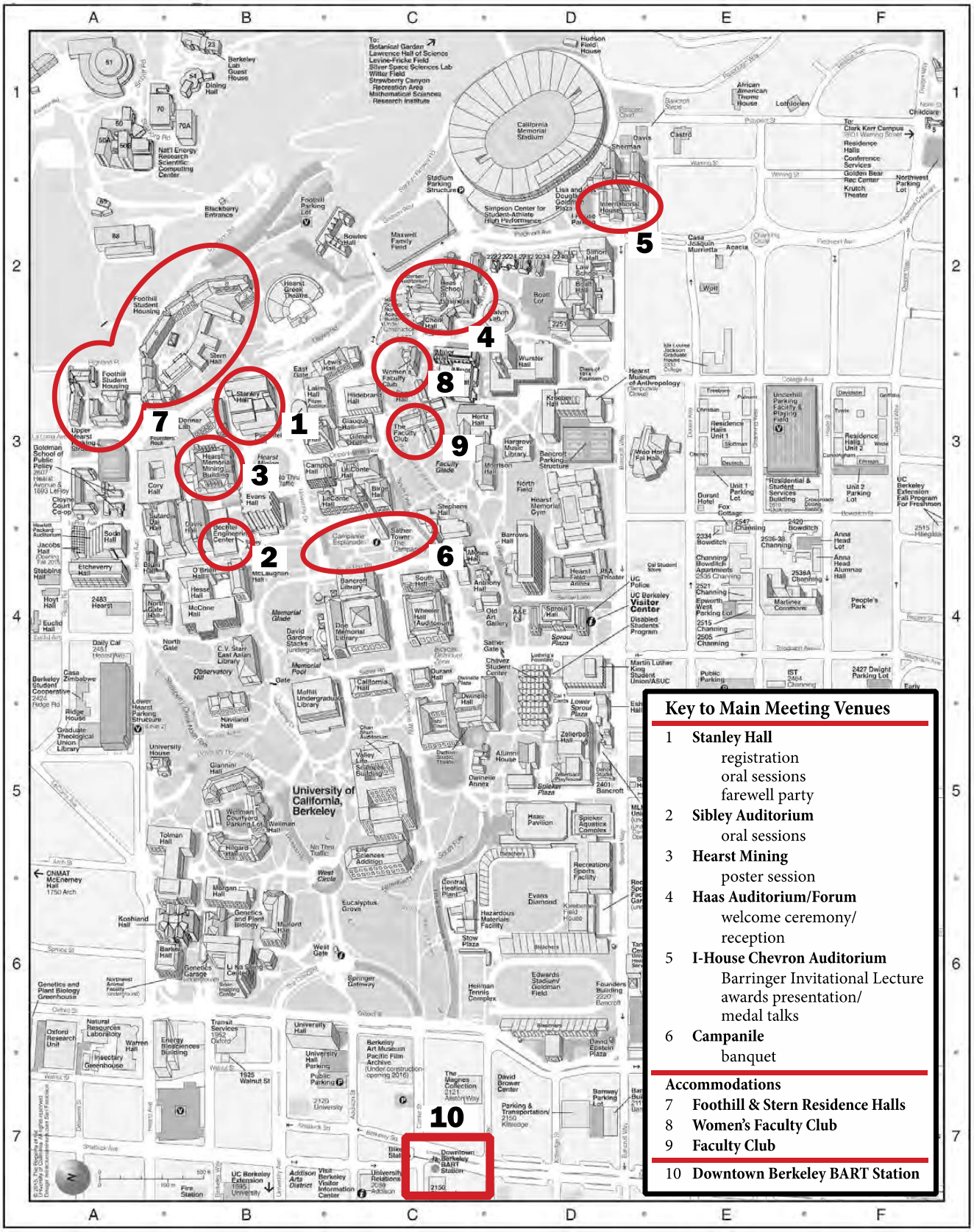
Thursday, July 30

8:30 a.m.	Stanley Hall Rm 105	Volatiles in the Solar System
8:30 a.m.	Sibley Auditorium	Achondrites: Early Planetary Processes and Evolution
11:45 a.m.	Stanley Hall Rm 105	Meteoritical Society Business Meeting
1:45 p.m.	Stanley Hall Rm 105	Carbonaceous Chondrites: Hydrous and Anhydrous
1:45 p.m.	Sibley Auditorium	Mars Exploration and Martian Meteorites: Petrology, Geochemistry, and Water-Rock Interaction

Friday, July 31

8:30 a.m.	Stanley Hall Rm 105	Microsample Analysis: IDPs, Micrometeorites, and Stardust
8:30 a.m.	Sibley Auditorium	Chondrites: Parent Bodies, Components, Alterations, and Impact Processes
1:30 p.m.	Stanley Hall Rm 105	Iron and Stony-Iron Meteorites: Composition, Isotopes, Shock, Ages – A Tribute Dedicated to Joe Goldstein
1:30 p.m.	Sibley Auditorium	Organic Matter in Meteorites: Sources, Distributions, and Evolution
4:30 p.m.	Stanley Hall Atriums and Patio	Farewell Party

UC Berkeley Meteoritical Society Places of Interest



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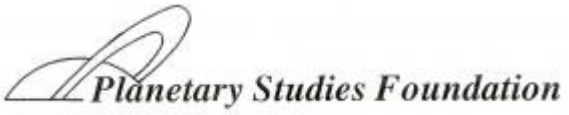

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Monday, July 27, 2015
PRESOLAR GRAINS AND ISOTOPIC ANOMALIES
8:45 a.m. Stanley Hall Room 105

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 CO_2 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 ^{17}O-Rich Silica Grain from the Orgueil Meteorite **[#5334]**
We report a 6 × 1 µm silica grain in the Orgueil chondrite with highly enriched ^{17}O, moderately enriched ^{18}O, 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 ^{18}O-Rich Silicate Grains in the Queen Alexandra Range 99177 CR3 Chondrite **[#5386]**
Silicate grains with ~5% ^{18}O 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 ^{16}O-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 ^{13}C-rich grain, with one of the lowest ^{12}C/^{13}C 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 ^{29}Si/^{30}Si Ratios: Implications for Supernova Models **[#5015]**
C, N, and Si isotope data of presolar SiC X grains with low ^{29}Si/^{30}Si 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.

Monday, July 27, 2015
DEVELOPMENTS IN ADVANCED TECHNIQUES FOR METEORITE AND RETURNED SAMPLE ANALYSIS
8:45 a.m. Sibley Auditorium

Chairs: **Derek Sears**
Barbara Cohen

8:45 a.m. Yesiltas M. * Sedlmair J. Hirschmugl C. J. Peale R. E.
Three-Dimensional FT-IR Tomography of Carbonaceous Chondrites **[#5043]**
We have applied three-dimensional synchrotron-based FT-IR spectro-microtomography technique to carbonaceous chondrites in order to obtain signatures and spatial distributions of organic matter as well as mineral species.

9:00 a.m. Sears D. W. G. * Ebel D. S. Wallace S. Friedrich J. M.
X-Ray Computed Tomography and the Radiation History of Meteorites **[#5156]**
In a blind test, five samples of Bruderheim were placed in a CT scanner and five kept as controls. The samples that were placed in the scanner received a radiation dose comparable to the dose received by meteorites during their cosmic ray exposure.

9:15 a.m. Friedrich J. M. * Glavin D. P. Rivers M. L. Dworkin J. P.
Effect of a Routine Synchrotron X-Ray Microtomography Scan on the Amino Acid Content of the Murchison CM Chondrite **[#5208]**
We conducted experiments to examine if exposure to synchrotron radiation during a typical µCT scan causes detectable changes in the amino acid content of a carbonaceous chondrite. We found a µCT scan caused no change in the amino acid content.

9:30 a.m. Caplan C. E. * Huss G. R. Hammer J. E. Ogliore R. C. Nagashima K.
Crystal Orientation Effects for Oxygen-Isotope Measurements of Magnetite and Chromite **[#5333]**
We measured the oxygen isotopic compositions of terrestrial magnetite and chromite to investigate instrumental mass fractionation due to crystal orientation.

9:45 a.m. Cohen B. A. *
The Potassium-Argon Laser Experiment (KArLE): In Situ Geochronology for Planetary Robotic Missions **[#5353]**
The Potassium (K) - Argon (Ar) Laser Experiment (KArLE) will make in situ whole-rock noble-gas geochronology measurements with 10% uncertainty or better for rocks 2 Ga or older, sufficient to resolve the absolute age of many planetary samples.

10:00 a.m. Sapers H. M. * Laquerre A. Hill P. J. A. Phaneuf M. W. Osinski G. R.
Large Area Imaging of Planetary Materials **[#5366]**
Astromaterials are extremely limited necessitating advanced non-destructive analytical techniques to maximize data collection. Large area imaging allows for contiguous image acquisition at resolutions as high as 100 nm for areas approaching 25 cm2.

Monday, July 27, 2015
IMPACT CRATERING PROCESSES: GLASSES AND MELTS
10:15 a.m. Sibley Auditorium

Chairs: **Wolf Uwe Reimold**
Christopher Hamann

10:15 a.m. Mohr-Westheide T. * Reimold W. U. Greshake A. Hoehnel D. Fritz J. Schmitt R. T. Salge T. Hofmann A. Oezdemir S. Schulz T. Koeberl C.
PGE Chemistry and Systematics of Some Archean Spherule Layers in the Barberton Mountain Land **[#5060]**
Comprehensive study of petrographic, mineralogical, and geochemical characteristics from a set of new samples of Archean spherule layers in the ICDP drill core BARB5 and drill core CT3 from the Barberton Greenstone Belt (BGB), South Africa.

10:30 a.m. Dos Santos E. * Scorzelli R. B. Rochette P. Devouard B. Gattacceca J. Moustard F. Cournède C.
A New Strewnfield of Splash-Form Impact Glasses in Atacama, Chile: A Mössbauer Study **[#5074]**
Recently, tektite-like glasses were discovered in the Atacama desert (Chile) and named atacamaites. The discovery of this new strewnfield allows us to extend the impact glass database and the understanding concerning these natural glasses.

10:45 a.m. Valenzuela M. * Blanco N. Tomlinson A. Roperch P. Devouard B. Gattacceca J. Rochette P.
Petrology and Magnetic Characterization of Molten Glass Samples Found at Northern Atacama Desert, Chile: Testing Their Impact Origin **[#5349]**
The discovery of molten glass deposits in Northern Chile on 2011 is pointing to an impact origin after other possibilities have been ruled out. We'll present a better characterization of the mineralogy and textures of the glasses.

11:00 a.m. Koeberl C. Wegner W. * Glass B. P.
Isotopic Compositions of Tektites from Belize **[#5320]**
Possible tektites from Belize, Central America, were analyzed for their Rb-Sr and Sm-Nd isotopic composition. They are unlike any other tektites and more similar to mantle compositions.

11:15 a.m. Hamann C. * Hecht L. Deutsch A.
Impact-Induced Devolatilization or Melting of Calcite? Or Both? Answers from MEMIN Experiments **[#5115]**
Calcite was experimentally shocked in a series of MEMIN hypervelocity impact and laser melting experiments. Evidence for the formation of calcite melts in both types of experiments is presented and discussed.

11:30 a.m. Walton E. L. * Dence M. R. Herd C. D. K.
Thermal Metamorphic Signature in Melt-Bearing Polymict Breccias from the Steen River Impact Structure, Canada **[#5123]**
Melt-bearing polymict breccias within drillcore from the Steen River impact structure are described which contain a matrix of clinopyroxene + feldspar + titanite + garnet + oxides formed by recyrstallization of a superheated clastic dust.

11:45 a.m. Wannek D. L. M. Reimold W. U. * Thirlwall M. Hansen B. T. Schulz T. Hoffmann M. Zaag P. T. Hauser N. Siegert S.
Are There Two Types of Vredefort Granophyre? **[#5066]**
The controversial scenario of a dike of Vredefort impact melt rock with a felsic and an intermediate phase is explored in Terms of petrographic, chemical, and isotopic data.

Monday, July 27, 2015
EARLY SOLAR SYSTEM CHRONOLOGY — A TRIBUTE DEDICATED TO IAN HUTCHEON
1:30 p.m. Stanley Hall Room 105

Chairs: **Gary Huss**
Jennifer Matzel

1:30 p.m. McKeegan K. D. * Liu M.-C.
A Devil in the Details: Matrix-Dependent $^{40}Ca^{42}Ca^{++}/^{42}Ca^{+}$ and Its Effects on Estimates of the Initial $^{41}Ca/^{40}Ca$ in the Solar System **[#5314]**
Ian Hutcheon established that the molecular ion interference $^{4}0Ca^{42}Ca^{++}/^{42}Ca^{+}$ on $^{41}K^{+}$ is strongly dependent on the mineral analyzed. Correction for this "matrix effect" led to a downward revision of the initial $^{41}Ca/^{40}Ca$ of the solar system.

1:45 p.m. Boss A. P. * Keiser S. A.
Supernova Shock Triggering and Injection into the Presolar Cloud: Effects of Rotational Axis Orientation **[#5001]**
New 3D hydrodynamical models show that a supernova shock wave can trigger the collapse of the presolar cloud and inject significant amounts of SNe isotopes regardless of the angle between the cloud's rotation axis and the shock propagation direction.

2:00 p.m. Bollard J. * Kawasaki N. Sakamoto N. Larsen K. Wielandt D. Schiller M. Connelly J. N. Yurimoto H. Bizzarro M.
Early Disk Dynamics Inferred from Isotope Systematics of Individual Chondrules **[#5211]**
We report U-corrected Pb-Pb ages and internal ^{26}Al-^{26}Mg isochrons of chondrules. The ^{26}Al-^{26}Mg ages are systematically younger from 0.7 to 3.1 Myr relative to the Pb-Pb ages, implying a reduced initial abundance of ^{26}Al in chondrule precursors.

2:15 p.m. Matzel J. * Jacobsen B. Simon J. I.
Aluminum-Magnesium Chronology of the Rim of a Murchison Type A CAI **[#5372]**
We measured the Al-Mg isotope systematics of anorthite, melilite, and spinel in the W-L rim of a Type A CAI and determined that the data fall along a slope corresponding to an initial $^{26}Al/^{27}Al$ of >2e-5.

2:30 p.m. Dunlap D. R. * Wadhwa M. Romaniello S. J. Souders A. K. Hines R.
^{26}Al-^{26}Mg Systematics of Ungrouped Achondrites: Implications for Timing of Planetesimal Differentiation **[#5317]**
High-precision ^{26}Al-^{26}Mg systematics are reported for anomalous eucrites SaU 493 and NWA 4470 and ungrouped primitive achondrites NWA 5297 and Tafassasset. We aim to understand the differentiation timescales for these unique achondrite parent bodies.

2:45 p.m. Yin Q.-Z. * Amelin Y. Koefoed P. Huyskens M. H. Sanborn M.
U-Pb Dating of the Allende CAI A63 1-C-1 **[#5088]**
High precision U-Pb absolute dating of Allende CAI A63 1-C-1 will be presented, together with Al-Mg and Mn-Cr ages we obtained with this CAI. The age reported here is subject to change pending final $^{238}U/^{235}U$ ratio measured on the same CAI.

3:00 p.m. Kita N. T. * Tenner T. J. Ushikubo T. Bouvier A. Wadhwa M.
Bullock E. S. MacPherson G. J.
Why Do U-Pb Ages of Chondrules and CAIs Have More Spread than Their ^{26}Al Ages? **[#5360]**
To test ^{26}Al homogeneity in the early solar system, we compare relative ^{26}Al ages of chondrules and CAIs with their absolute U-Pb ages. We will summarize the relevant data and discuss possible causes of discrepancies between the two chronometers.

3:15 p.m. Alexander C. M. O'D. *
The Closely Linked Timing of Chondrule and Chondrite Formation **[#5369]**
Chondrules from a single group formed over a very short time interval and shortly before accretion of their parent body.

3:30 p.m. Jilly-Rehak C. E. * Huss G. R. Nagashima K.
^{53}Mn-^{53}Cr Dating of Secondary Dolomite in a Renazzo (CR Chondrite) Dark Inclusion **[#5136]**
Mn-Cr dating of dolomite indicates formation ~4 Myr after CAIs, similar to calcite from the Renazzo matrix, but distinct from the late-stage calcite age in another CR chondrite. The dolomite age agrees with carbonates in CI and CM chondrites.

3:45 p.m. Krot A. N. * Doyle P. M. Nagashima K. Jogo K. Wakita S. Ciesla F. J. Alexander C. M. O'D. Bonal L. Fujiya W.
Chronology of Aqueous Activity and Sources of Water on the Chondrite Parent Bodies: Testing the Grand Tack Model **[#5150]**
To test the Grand Tack dynamical model of the solar system evolution, the accretion regions of hydrated chondrite asteroids are constrained using ^{53}Mn-^{53}Cr and O-isotope systematics of aqueously formed minerals, thermodynamical and physical modeling.

4:00 p.m. Blackburn T. * Alexandar C. M. O'D. Carlson R. W. Elkins-Tanton L.
Accretion and Impact Histories of OC Parent Bodies Constrained by Phosphate Pb-Pb Dates, Thermal, and Ni-Metal Modeling **[#5331]**
We present new phosphate Pb-Pb data from ten ordinary chondrites. These data and metallographic data are interpreted with a series of models designed to simulate the thermal Pb in phosphate and Ni-in-metal evolution for a chondrite parent body.

4:15 p.m. Pravdivtseva O. * Meshik A. Hohenberg C. M. Irving A. J.
I-Xe Systematics of Brachinite-Like Ultramafic Achondrite Northwest Africa 5400 **[#5387]**
I-Xe studies of separated mineral phases indicate that I-Xe systematics in NWA 5400 apparently survived parent body processing.

4:30 p.m. Amelin Y. * Koefoed P. Bischoff A. Budde G. Brennecka G. Kleine T.
Pb Isotopic Age of ALM-A — A Feldspar-Rich Volcanic Rock from the Crust of the Ureilite Parent Body **[#5344]**
Pb-isotopic age of ALM-A (Almahata Sitta trachyandesitic meteorite) is determined at 4562.0 ± 3.4 Ma.

4:45 p.m. Koefoed P. * Amelin Y. Irving A. J.
U-Pb Age of Ungrouped Achondrite NWA 10132 **[#5218]**
NWA 10132 is a recently discovered achondrite which shares many similarities to the unique achondrite NWA 6704. Here we present the U-Pbb age of NWA 10132 and compare it to that of NWA 6704.

Monday, July 27, 2015
IMPACT CRATERING PROCESSES: SHATTERING, SHOCKING, BOMBARDING
1:30 p.m. Sibley Auditorium

Chairs: **Michael Poelchau**
Megan Bruck Syal

1:30 p.m. Buchner E. * Schmieder M.
Possible Impactor Remnants on Shatter Cone Surfaces from the Steinheim Basin, SW Germany **[#5007]**
Surfaces of Steinheim shatter cones are covered by mineral coatings that consist of Fe, Ni, Co, Cu, Pt, and Au mineral assemblages. A plausible explanation is that they represent impactor matter remobilized in an impact-induced hydrothermal system.

1:45 p.m. Kenkmann T. * Wilk J.
Shatter Cones: A Cascade of Bifurcations During Dynamic Fragmentation **[#5216]**
Shatter cones display branching ridges and grooves on their surface. We propose that the frequency of bifurcations, the bifurcation angle, and the curvature of propagating fractures control their geometry. A heterogeneity at the apex is not required.

2:00 p.m. Hossain M. S. * Kruhl J. H.
Characteristics and Extent of Fragmentation Structures Around an Impact Crater **[#5029]**
Impact-induced dynamic deformation form typical fragmentation structures that are different from the quasi-static tectonic fragmentation structures. The characteristics of these structures show systematic changes with distance from the impact centre.

2:15 p.m. Ferrière L. * Brandstätter F.
What is Maskelynite? Back to the Original Description and Thin Sections in Which it was First Described **[#5184]**
In the last decades the word maskelynite has been used to describe both, glasses formed by solid-state transformation (i.e., diaplectic glass) and by quenching from a melt. In the original definition by Tschermak, maskelynite is formed by melting.

2:30 p.m. Chang Y. * Kayama M. Tajika E. Sekine Y. Sekine T. Nishido H. Kobayashi T.
Shock-Induced Effect on Chathodoluminesence of Experimentally Shocked Quartz **[#5189]**
We conducted a series of shock recovery experiments on single crystals of natural and synthetic quartz. In the presentation, we show the results of the variation of Cathodoluminescence (CL) spectral features with increasing shock pressure.

2:45 p.m. Kowitz A. * Schmitt R. T. Reimold W. U. Holzwarth A.
Formation of Shock Features in the 2.5 to 20 GPa Shock Pressure Range in Porous Sandstone and Quartzite **[#5059]**
We are focusing on shock deformation experimentally generated in 1. porous, 2. water-saturated sandstone, 3. dense quartzite, at pressures <20 GPa. Shock compression of porous sandstone results in different effects than observed in non-porous rocks.

3:00 p.m. Tikoo S. M. * Swanson-Hysell N. L. Bezaeva N. S.
Rock Magnetic Effects Induced in Basalt and Diabase by >20 GPa Experimental Spherical Shock Waves **[#5079]**
Our spherical shock experiments on basalt and diabase demonstrate that shock-induced magnetic effects at pressures >20 GPa likely include coercivity changes, shock demagnetization and thermal remagnetization.

3:15 p.m. Bruck Syal M. * Chen L. Herbold E. B. Owen J. M. Swift D. Miller P. L.
Meteorite Material Properties for Use in Impulsive Asteroid Deflection Simulations **[#5282]**
Numerical modeling of asteroid deflection by impacts or nuclear devices is refined using data from high-strain-rate experiments on a variety of chondrite samples.

3:30 p.m. Winkler R. * Poelchau M. H. Moser S. Hoerth T. Schäfer F. Kenkmann T.
Subsurface Deformation in Hypervelocity Cratering Experiments into High-Porosity Tuffs **[#5121]**
Three hypervelocity impact experiments into 43% porosity tuff were performed to analyze the effects of porosity during impact cratering. We investigated the crater shapes and processes in the subsurface of hypervelocity impacts.

3:45 p.m. Poelchau M. H. * Hoerth T. Pietrek A. Schäfer F. Kenkmann T.
Transient Crater Growth and Ejecta Behavior in Experimental Impacts into Geological Materials **[#5249]**
High-speed images from cratering experiments were evaluated. Initial results suggests that transient crater growth rates in strength-dominated cratering increase with velocity and projectile size, and ejecta cone angles increase with velocity.

4:00 p.m. Wünnemann K. * Zhu M. H.
Numerical Modeling of Ejecta Distribution and Crater Formation of Large Impact Basins on the Moon **[#5108]**
We present a systematic modeling study of ejecta distribution at large impact basins as a function of impactor size, velocity, crustal thickness, and thermal gradient to predict the thickness, composition, and melt content of the ejecta blanket.

4:15 p.m. Ezzedine S. M. * Miller P. L. Dearborn D. S. P.
Parametric Studies of the Effect of Bolides Impacts on Earth or Their Near-Surface Airbursts on Cratering **[#5393]**
We have conducted numerical simulations of cratering formation due to impact on ground and ocean. Cratering scaling laws have been derived for both cases. A sensitivity analysis has been conducted to identify key parameters for cratering formation.

4:30 p.m. Schmitz B. * Boschi S. Cronholm A. Heck P. R. Monechi S. Montanari A. Terfelt F.
Fragments of Late Eocene Earth-Impacting Asteroids Linked to Disturbance of Asteroid Belt **[#5040]**
The impactors that created the large Popigai and Chesapeake Bay craters represent two different meteorite types. A Late Eocene multi-type asteroid shower may reflect solar-system instability and indicate an astronomical trigger of ice-house climate.

4:45 p.m. Trieloff M. *
Close Encounters Within the Sun´s Stellar Cluster as Trigger for the LHB and Other Episodic Bombardments of Terrestrial Planets **[#5261]**
As geochronological data indicate possible pre LHB episodic bombardments of inner solar system bodies, it is suggested that the early sun experienced close stellar encounters that led to dynamical excitation of minor body populations.

Tuesday, July 28, 2015
CAIS AND OTHER REFRACTORY MATERIALS
8:30 a.m. Stanley Hall Room 105

Chairs: **Audrey Bouvier**
Timothy Fagan

8:30 a.m. Kööp L. * Davis A. M. Kita N. T. Nakashima D. Tenner T. J. Krot A. N. Park C. Nagashima K. Heck P. R.
^{26}Al-Depletions in Anomalous and Solar PLAC-Like CAIs Suggest High Degrees of Processing in the Early Solar Nebula **[#5225]**
Our Al-Mg study of PLAC-like CAIs shows that both isotopically anomalous and solar (in terms of O, Ca, Ti) PLAC-like CAIs are depleted in ^{26}Al, suggesting that homogenized reservoir(s) had been established prior to a widespread distribution of ^{26}Al.

8:45 a.m. Kawasaki N. * Sakamoto N. Yurimoto H.
Formation Period for a Fluffy Type A CAI from Vigarano **[#5028]**
We measured the O and Al-Mg isotopes of a fluffy Type A CAI from Vigarano. The results suggest the CAI was formed within a time duration of 0.22 ± 0.11 Myr in a variable O isotope reservoir changing from ^{16}O-rich to ^{16}O-poor and back to ^{16}O-rich.

9:00 a.m. Paque J. M. * Burnett D. S. Beckett J. R. Guan Y.
Materials Older Than Ca-Al-Rich Inclusions **[#5281]**
Concentrations of refractory lithophile elements (RLE) in CAIs are dominated by potentially relict submicron inclusions. Thousands of SIMS analyses in Leoville and Allende allow resolution of RLE concentrations of melilite and inclusions.

9:15 a.m. Bouvier A. * Boyet M.
Sm and Nd Isotopic Compositions of CAIs **[#5294]**
We have measured the Sm and Nd stable and radiogenic isotopic compositions of two individual CAIs. We report isotopic anomalies and an initial solar system ^{146}Sm/^{144}Sm value which is more consistent with using a ^{146}Sm half-life of 68 Ma.

9:30 a.m. Tang H. * Liu M-C. McKeegan K. D. Tissot F. L. H. Dauphas N.
Oxygen Isotopes and High ^{26}Mg Excesses in a U-Depleted Fine-Grained Allende CAI **[#5263]**
We analyzed the oxygen isotope compositions and Al-Mg systematics of a U-depleted fine-grained Allende CAI ME-3364 3.2 to constrain the conditions of its formation and a high, uniform ^{26}Mg excess was identified over a large range of ^{27}Al/^{24}Mg values.

9:45 a.m. Mishra R. K. * Simon J. I. Messenger S. Marhas K. K. Ross D. K. Needham A. W. Han J.
Oxygen Isotopes in Perovskites and Associated Mineral Assemblages in a Hibonite-Bearing Allende CAI **[#5133]**
Heterogeneous oxygen isotopes are measured by NanoSIMS in perovskite contained in the Wark-Lovering rim and multiple distinct assemblages of refractory minerals contain within a hibonite-bearing Allende CAI.

10:00 a.m. Lee T. * Liebig B. Peeters Z. Wang C.-K.
An Interesting Place to Search for Pre-Solar Ca and Ti **[#5295]**
Perovskite in CAI rim may be a good place to search for presolar Ca and Ti. We have found an Allende CAI with a rim rich in perovskite <7μm. A SIMS technique is being developed to study Ca and Ti isotopes on um-sized grains with <1% precision.

10:15 a.m. Fagan T. J. * Aragane H. Enokido Y. Brearley A. J.
Metamorphism of an Efremovka Type B CAI and Comparison with Other Settings of Alteration **[#5094]**
Primary minerals in a type B CAI from Efremovka are partially altered to feldspathoids, Fe-spinel and secondary anorthite. The extent of recrystallization is not as great as in typical Allende CAIs, but metamorphism has affected Efremovka CAIs.

10:30 a.m. Daly L. * Bland P. A. Forman L. V. Trimby P. W. Moody S. Yang L. Liu H. W. Ringer S. P. Saunders M.
In Situ Analysis of Refractory Metal Nugget Crystallography Providing Clues to Early Solar System Events **[#5061]**
In situ analysis of refractory metal nuggets has revealed several textural features that have not previously been reported, such as twinning and crystallographic relationships with associated minerals; as well as the discovery of a new mineral phase.

10:45 a.m. Needham A. W. * Messenger S. Keller L. P. Simon J. I. Han J. Mishra R. K. Marhas K. K.
Aluminum-Magnesium Isotope Systematics in Wark-Lovering Rims **[#5014]**
Here we present Al-Mg isotope data for the core, mantle and Wark-Lovering rim of a CAI. Evidence for live ^{26}Al is found in the mantle melilite, rim melilite and rim hibonite but is lacking in rim anorthite.

11:00 a.m. Mane P. * Hervig R. Bose M. Wadhwa M.
Trace Element Abundances in Wark-Lovering Rims of CAIs from a CV3 Meteorite: Implications for Their Chronology **[#5327]**
We report trace element analyses of Wark Lovering rims and their host CAIs from NWA 8323 CV3 chondrite to assess the potential effects of secondary alteration and conclude that they are minimally affected by such processes.

11:15 a.m. Han J. * Keller L. P. Needham A. W. Messenger S. Simon J. I.
Microstructural Investigation of a Wark-Lovering Rim on a Vigarano CAI **[#5243]**
We describe the microstructure and mineralogy of a Wark-Lovering rim on a Vigarano type B CAI using FIB/TEM to better understand the astrophysical significance of Wark-Lovering rim formation.

11:30 a.m. Beckett J. R. * Harvey J. P. Ma C. Stolper E. M.
The Stability of Zirconia-Saturated Perovskite and Conditions in the Early Solar System **[#5245]**
We conducted experiments on zirconia-saturated perovskites in the system CaO-TiO2-ZrO2 and on the same bulk compositions doped with one of Al, Mg, Sc, Y, La, Nd, Gd, or Yb.

11:45 a.m. Ma C. * Krot A. N. Beckett J. R. Nagashima K. Tschauner O.
Discovery of Warkite, Ca2Sc6Al6O20, a New Sc-Rich Ultra-Refractory Mineral in Murchison and Vigarano **[#5025]**
Warkite is a new Sc-rich mineral, discovered in ultra-refractory inclusions. It is likely a very-early player in the final assembling of solid materials from an ^{16}O-rich gaseous reservoir, formed under highly reducing conditions.

Tuesday, July 28, 2015
ASTEROIDS AND COMETS: REMOTE OBSERVATIONS
8:30 a.m. Sibley Auditorium

Chairs: **Michael Zolensky**
Vishnu Reddy

8:30 a.m. Hartmann W. K. *
Physical Mechanism of Comet (and Asteroid) Outbursts: The Movie **[#5002]**
A film made during impact experiments at NASA Ames illustrates a mechanism in which regolith can become gas charged and then erupt to create outbursts as observed on comets (and "asteroids" such as 2060 Chiron).

8:45 a.m. McSween H. Y. *
Mineralogy of Ceres: Comparison with CM Carbonaceous Chondrites **[#5049]**
Ceres spectroscopy indicates a link to the mineralogy of CM carbonaceous chondrites, although the alteration pathways and conditions may have varied.

9:00 a.m. Reddy V. * Nathues A. Le Corre L. Li J.-Y. Schäfer M. Hoffmann M. Russell C. T. Mengel K. Sierks H. Christensen U.
Nature of Bright Spots on Ceres from the Dawn Framing Camera **[#5161]**
We report latest results from the Dawn Framing Camera observations of bright spots on Ceres. Our analysis suggests that these bright spots are water ice associated with impact craters. We will present results of potential meteorite analogs for Ceres.

9:15 a.m. Zolensky M. E. * Fries M. Chan Q. H.-S. Kebukawa Y. Steele A. Bodnar R. J.
The Mineralogy of Ceres (*Or Something an Awful Lot Like It)* **[#5270]**
The mineralogy of Ceres is available via analysis of xenolithic materials found in two H chondrites.

9:30 a.m. Zolotov M. Yu. *
Physical Chemistry of Impact-Generated Fluids and Bright Spots on Ceres **[#5384]**
Bright-spots on Ceres could be temporal water ice deposits formed atop impact-generated hydrothermal systems.

9:45 a.m. Beck P. * Quirico E. Moroz L. V. Schmitt B. Arnold G. Ciarniello M. Bonal L. Capaccioni F. Filacchione G. Erard S. Leyrat C. Bockelée-Morvan D. Tosi F. Raponi A. Capria M. T. De Sanctis M. C.
The Nucleus of 67P Observed by VIRTIS/Rosetta: Different from Carbonaceous Chondrites and Similar to D-Type Asteroids? **[#5188]**
We will discuss observations of the crust of 67P by VIRTIS/Rosetta and compare with carbonaceous chondrites and D-type asteroids.

10:00 a.m. Nakamura T. * Iwata T. Kitasato K. Abe M. Osawa T. Matsuoka M. Nakauchi Y. Arai T. Komatsu M. Hiroi T. Imae N. Yamaguchi A. Kojima H.
Reflectance Spectra Measurement of Various Carbonaceous Chondrites Using Hayabusa-2 Near Infrared Spectrometer **[#5206]**
We measured reflectance spectra of nine carbonaceous chondrites using the NIRS3 flight model. The results indicate that NIRS3 can characterize key properties such as water contents and temperature of surface material of asteroid 1999JU3.

Tuesday, July 28, 2015
ISOTOPIC, CHEMICAL, AND EXPERIMENTAL STUDIES OF LUNAR SAMPLES
10:15 a.m. Sibley Auditorium

Chairs: **Jisun Park**
Joshua Snape

10:15 a.m. Martinez M. H. * Thiemens M. H.
Oxygen Isotopic Composition of Water in Selected Lunar Samples **[#5152]**
We present here results of analyses of the oxygen isotopic composition of water extracted from lunar samples (10049, 10057, 10060, 12021, 12039, 14163, 14305, 79035) and a discussion of their implications on the potential source(s) of lunar water.

10:30 a.m. Hidaka H. * Yoneda S.
Systematic Isotopic Variations of Strontium, Barium, and REE of Surficial Lunar Soils **[#5101]**
Systematic isotopic analyses of Sr, Ba, Ce, Nd, Sm, and Gd were performed on the chemical separates of lunar soils collected from very surficial layers on the Moon. We found significant isotopic excess of ^{84}Sr, ^{130}Ba, ^{132}Ba, ^{136}Ce and ^{144}Sm.

10:45 a.m. Thompson M. S. * Zega T. J.
Simulation of Micrometeorite Impacts Through In Situ Dynamic Heating of Lunar Soils **[#5389]**
We performed heating experiments of lunar soils inside a transmission electron microscope to simulate a micrometeorite impact, relevant for space weathering processes. We observed microchemical and microstructural changes in soil grains as a result.

11:00 a.m. Crow C. A. * Crowther S. A. Gilmour J. D. Busemann H. Moser D. E. McKeegan K. D.
U-Xe Degassing Ages of Terrestrial and Lunar Impact Zircons **[#5226]**
We present U-Xe degassing ages for individual zircons from Apollo 14 samples and the terrestrial impact structure at Vrederfort, South Africa. Preliminary results suggest the degassing ages are consistent with or younger than their ^{207}Pb-^{206}Pb ages.

11:15 a.m. Han J. * Lee J. I. Park C. Lee M. J. Kim T. Yi K. Kwon S.-T.
Petrography, Geochemistry, and Age of a Granophyre Clast in the Lunar Meteorite DEW 12007 **[#5170]**
Lunar meteorite DEW 12007 contains a granophyre clast (C3). Its petrography, mineralogy, and zircon age data will be presented and its possible origin will be discussed.

11:30 a.m. Nagaoka H. * Karouji Y. Fagan T. J. Ebihara M. Takeda H. Hasebe N.
Variations in KREEP-Enrichment of NWA 773 Clan Olivine Gabbros and Breccias Based on Whole-Rock Compositions **[#5185]**
We present whole rock analyses of various NWA 773 clan breccias and olivine cumulate gabbro lithologies to infer their origins.

11:45 a.m. Snape J. F. * Nemchin A. A. Bellucci J. J. Whitehouse M. J. Tartèse R. Barnes J. J. Anand M. Crawford I. A. Joy K. H.
New Pb-Isotopic Constraints on the Age of the Moon **[#5236]**
We present new Pb isotope data for a range of lunar basalts and discuss the implications of these data for the timing of the Moon formation and the early magmatic evolution of the lunar interior.

Tuesday, July 28, 2015
FORMATION OF CHONDRULES AND CHONDRITE PRECURSORS
1:30 p.m. Stanley Hall Room 105

Chairs: **Denton Ebel**
Steven Desch

1:30 p.m. Barth M. I. F. * Harries D. Langenhorst F.
Microstructural Characteristics of Polycrystalline Sulfide-Assemblages in Acfer 094 **[#5046]**
Concentric polycrystalline sulfide-assemblages in Acfer 094 provide insights into early solar system metal-gas interactions, that may have occurred under highly variable sulfide and oxide formation conditions.

1:45 p.m. Yamamoto D. * Tachibana S.
Crystallization of Amorphous Forsterite Promoted by Water Vapor **[#5247]**
We found that crystallization of amorphous forsterite is promoted in the presence of water vapor, implying that water vapor may act as a catalyst for crystallization of amorphous silicates in protoplanetary disks.

2:00 p.m. Metzler K. * Pack A.
Chondrules in LL3 Cluster Chondrites: Evidence for Interaction of Chondrule Melts with Nebular Gas **[#5118]**
Cluster chondrites probably formed by hot chondrule accretion. They show evidence for interaction of chondrule melts with surrounding gas, namely oxygen isotope exchange and chemical modification of (Type I) chondrules due to open system behaviour.

2:15 p.m. Ebert S. * Bischoff A.
Formation of Na-Rich Chondrules by Melting of Na-Rich and Condensed (Ultra)-Refractory Precursors **[#5062]**
We analyzed 33 Na-rich chondrules (Na2O >4.0 wt%) from 15 different chondrites. These chondrules must have formed by melting of precursors including Na-rich materials (like nepheline) as well as condensed (ultra)-refractory components.

2:30 p.m. Rubin A. E. * Baecker B. Wasson J. T.
Overgrowth Layers on Olivine Phenocrysts in High-FeO Semarkona Chondrules Revealed by P, Fe, and Cr X-Ray Maps: Evidence for Multiple Melting of Chondrules **[#5033]**
Olivine phenocrysts in FeO-rich chondrules exhibit multiple overgrowth layers, reflecting distinct heating events. The layers are evident in P, Fe, and Cr X-ray maps. Normal zoning in Fe, Cr, and Ca is simulated by diffusion caused by chondrule reheating.

2:45 p.m. Ebel D. S. * Crapster-Pregont E. J. Lobo A.
Hierarchical Accretion: Evidence from Compositional Diversity of CO and Ordinary Chondrite Inclusions **[#5155]**
Element abundances in chondrules in CO and LL3 chondrite show much higher variability in CO than in LL3. This supports a hierarchical accretion model and complementarity. Big LL3 chondrules could form by accretion and melting of small CO components.

3:00 p.m. Crapster-Pregont E. J. * Towbin W. H. Ebel D. S.
Insights on Chondrule Formation from Electron Backscattered Diffraction of Chondrule Metal Layers in Acfer 139 (CR2) **[#5129]**
Chondrule formation and deformation history can be derived from metal layer characteristics using EBSD and simultaneously collected EDS.

3:15 p.m. Weisberg M. K. * Ebel D. S. Kimura M.
Metal-Rich Nodules in EL3 Chondrites and Almahata Sitta EL3 Clast MS-177 **[#5312]**
Metal-rich nodules in Almahata Sitta EL3 clast MS-177 and other EL3s may be aggregates of condensates and/or phases that crystallized in a metallic (chondrule-like) melt.

3:30 p.m. Simionovici A. S. * David G. Lemelle L. Boyet M. Gillet Ph. Rivard C. El Goresy A.
Dual Energy Nano-XRF Quantification in EL-3 Fragments of the Almahata Sitta TC3 Asteroid **[#5230]**
We studied idiomorphic sinoite crystals in MS-17/177 fragments of A-S TC3 asteroid by dual energy XRF nano-imaging at ESRF (Grenoble, France), down to O/N and confirm previous findings favoring the CaS-Si_2N_2O condensation sequence scheme.

3:45 p.m. Tenner T. J. * Nakashima D. Ushikubo T. Weisberg M. K. Kita N. T.
SIMS Al-Mg Chronology of CR Chondrite Chondrules: Links with Mg# and O Isotopes **[#5325]**
When did chondrules form? / Al-Mg isotopes / Unlock the secrets.

4:00 p.m. Roth A. S. G. * Metzler K. Hofmann B. Baumgartner L. P. Leya I.
Cosmic-Ray Exposure Ages of Chondrules **[#5224]**
Chondrules might have been exposed to energetic particles prior to accretion. If so, they should show excess of cosmogenic noble gases and cosmic ray tracks relative to the rest of the meteorite. Here we report new data for tracks and exposure ages.

4:15 p.m. Grossman L. * Fedkin A. V.
Dust Enrichment: Less than Meets the Eye **[#5126]**
Massive dust enrichment of nebular regions produces oxidizing conditions at high temperature but reduction of FeO occurs upon cooling, unless the dust contains water.

4:30 p.m. Desch S. J. * Turner N. J.
High-Temperature Ionization of Dusty Gases and Implications for Chondrule Formation in Current Sheets **[#5377]**
We consider how hot nebular gas is ionized, including a new effect: thermionic emission from dust grains. We analyze how the short-circuit instability would behave. We find it difficult to initiate and not consistent with chondrule formation.

4:45 p.m. Sanders i. S. * Scott E. R. D.
Were Chondrules Made by the 'Splashing' of Molten Planetesimals? **[#5180]**
We discuss recent arguments against the idea that most chondrules were made in dense impact plumes created by low-speed collisions involving substantially molten planetesimals.

5:00 p.m. Richardson M. L. A. Morris M. A. *
Chondrule Formation from Ejecta Melts with Adaptive Mesh Refinement **[#5134]**
We discuss collisional ejecta as a progenitor of CH/CB chondrules. We present our method of mapping from Smooth Particle Hydrodynamics to Adaptive Mesh Refinement, and discuss new challenges that arise during its implementation on planetary scales.

5:15 p.m. Gaidos E. * Yin Q.-Z.
Chips Off the Old Block: Enstatite Chondrites as Samples of the Proto-Earth **[#5145]**
We link enstatite chondrites (EC) formation with the evolution of the early solar system and propose that EC formed when proto-earth material equilibrated with oxygen-poor gas from which solids of carbonaceous chondrite-like composition were removed.

Tuesday, July 28, 2015
EXPOSURE HISTORY AND DELIVERY OF METEORITES FROM ASTEROIDS, MARS, AND THE MOON, FROM FALLS, FINDS, AND RECOVERIES
1:30 p.m. Sibley Auditorium

Chairs: **Matthias Meier**
Hisayoshi Yurimoto

1:30 p.m. Smith T. * Leya I. Hofmann B. Merchel S. Rugel G. Pavetich S.
Exposure and Terrestrial Age of the Twannberg Meteorite Based on Cosmogenic Noble Gases and Radionuclides **[#5201]**
Here we study the cosmic ray exposure history of Twannberg meteorite using cosmogenic radionuclides and noble gases. We are especially interested in the terrestrial age to better understand its relation with the associated glacial sediments.

1:45 p.m. Harries D. * Yakame S. Uesugi M. Langenhorst F.
FIB-TEM Anatomy of a Sub-Micrometer Impact Crater on a Hayabusa Grain **[#5095]**
We investigated Hayabusa grain RA-QD02-0265, which was found to contain a cluster of sub-micrometer-sized crater-like features. The cluster of craters is most likely due to secondary impacts of particles generated by an nearby (micro-)impact event.

2:00 p.m. Yurimoto H. * Bajo K. Sakaguchi I. Suzuki T. T. Itose S. Matsuya M. Ishihara M. Uchino K.
Microdistribution of Solar Wind Helium on Itokawa Particle Surfaces **[#5214]**
We report three-dimensional distribution of solar wind He irradiated on asteroid Itokawa particles with a voxel resolution of 500×800×3 nm^3. The distribution is heterogeneous suggesting escape of He by diffusion and mechanical erosion of particle.

2:15 p.m. Ogliore R. C. * Nagashima K. Thomen A. Dobrica E.
An Impact-Vapor Condensate from Asteroid Itokawa: Evidence from O and Si Isotopes **[#5166]**
We measured O and Si isotopes in a porous adhering grain from asteroid Itokawa to test the hypothesis that it is a vapor condensate from a micrometeoroid impact.

2:30 p.m. Bowling T. J. * Johnson B. C. Melosh H. J.
Dwell Time at High Pressure of Meteorites Ejected from Mars **[#5310]**
We use high resolution impact models to relate the high pressure dwell time of martian meteorites to the size of their source craters.

2:45 p.m. Keller L. P. * Christoffersen R. Dukes C. A. Baragiola R. A. Rahman Z.
Fe and O EELS Studies of Ion Irradiated Murchison CM2 Carbonaceous Chondrite Matrix **[#5354]**
EELS measurements show that the Fe^{3+}/Fe^{2+} ratio is reduced during He ion irradiation of Murchison matrix. These experiments are meant to simulate possible space weathering processes on primitive asteroids.

3:00 p.m. Wetteland C. J. * Sickafus K. E. Taylor L. A. McSween H. Y.
Proton Irradiation Processing of Early Solar System Solids **[#5276]**
High-flux protons from Young Stellar Objects may result in secondary processing of early solar system solids. Chondrule precursors may be subjected to heating (possibly melting), nuclear transmutation, comminution, and carbon deposition.

3:15 p.m. Riebe M. * Huber L. Wieler R. Metzler K. Maden C. Meier M. M. M. Busemann H.
A Regolith Origin of "Pre-Irradiation" of Murchison Chondrules **[#5030]**
Individual chondrules from a lithic fragment in Murchison all have similar CRE ages whereas chondrules from outside the fragment have variable ages, providing evidence that additional irradiation of chondrules occurred in the parent body regolith.

3:30 p.m. Meier M. M. M. * Bindi L. Busemann H. Heck P. R. Isch Neander A. Maden C. Spring N. H. Steinhardt P. J. Wieler R.
Shedding Light on the Origin of the Quasicrystal-Bearing Khatyrka Meteorite **[#5035]**
We measure He, Ne in individual forsteritic olivine grains from the CV chondrite Khatyrka, the only known natural host of Al,Cu-alloys and quasicrystals, to reconstruct the cosmic history of this meteorite and its exotic materials.

3:45 p.m. Sansom E. K. * Bland P. A. Towner M. C. Paxman J. P. Howie R. M. Cupak M. Galloway M. J. Benedix G. K.
Initial Results from the Expanded Desert Fireball Network **[#5172]**
The Desert Fireball Network doubled in size at the end of 2014. Over 90 multiple-station fireballs have been observed. Within this dataset we believe there are a number of meteorite-dropping events. Search areas and strategies will be discussed.

4:00 p.m. Artemieva N. A. * Shuvalov V. V.
Recovery of Meteorites After Large Meteorite Falls — Mass Deficiency Problem **[#5089]**
We model an entry of large severely fragmented meteoroids with the atmosphere to demonstrate that they ablate much more intensely than 'casual' small meteoroids.

4:15 p.m. Utas J. A. * Baecker B.
Meteorite-Concentrating Process Observed and Recorded on a Desert Playa **[#5356]**
Over the course of several days, we recovered ten meteorites from a densely rocky stretch of lake shore 0.8 km long and 1–2 m wide. We documented ice actively moving stones onto the shore and present clear evidence of the processes involved.

4:30 p.m. Zanda B. * Colas F. Bouley S. FRIPON Team
Fripon, The French Fireball Network **[#5296]**
FRIPON is a fireball observation network to cover France with >100 all-sky cameras and 25 radio detectors. Orbits will be reconstructed to determine source regions, as well as fall locations for objects large enough to reach the ground.

4:45 p.m. Howie R. M. * Paxman J. Bland P. A. Towner M. C. Sansom E. K. Galloway M. J.
How to Turn a DSLR into a High End Fireball Observatory **[#5196]**
A design for small, power efficient high end meteor cameras is presented focusing on the novel technique making it possible and the advantages over previous designs.

5:00 p.m. Reedy R. C.
Extreme Solar Particle Events and Their Effects on Meteorites **[#5288]**
Both modern and ancient solar events with very-high fluxes of energetic protons are reviewed. Huge events were observed in 2012, 1859, 993, and 775. The production of cosmogenic nuclides in meteorites, including that by extreme events, is discussed.

5:15 p.m. Kohout T. * Gritsevich M. Lyytinen E. Moilainen J. Trigo-Rodríguez J. M. Kruglikov N. Ishchenko A. Yakovlev G. Grokhovsky V. Haloda J. Halodova P. Meier M. M. M. Laubenstein M. Dimitrev V. Lupovka V.
Annama H5 Meteorite Fall: Orbit, Trajectory, Recovery, Pe-trology, Noble Gases, and Cosmogenic Radionuclides **[#5209]**
Annama is a new instrumentally recorded H5 fall with known heliocentric orbit and with a complex cosmic-ray exposure history.

Tuesday, July 28, 2015
POSTER SESSION
5:30 p.m. HMMB Floor One

VOLATILES IN THE SOLAR SYSTEM

Meier M. M. M. Cloquet C. Marty B.
Making Sense of Mercury Isotopic and Abundance Variations in Meteorites **[#5021]**
We report variations in abundance and isotopic composition of Hg in meteorites and discuss a model of parent body Hg evaporation and re-condensation to explain these variations.

Buikin A. I. Hopp J. Lorenz C. A. Trieloff M.
Noble Gas Isotope Composition and Elemental Ratios in Pesyanoe Aubrite: Stepwise Crushing Data **[#5110]**
The first stepwise crushing light noble gas data on two pyroxenite lithologies of Pesyanoe aubrite suggest that both lithologies experienced different magmatic and post-magmatic (including impact and irradiation) histories on their parent body.

Amari S. Meshik A.
Noble Gas Analysis of Q-Rich Fractions from Saratov (L4) **[#5213]**
We carried out colloidal and density separations to a Saratov (L4) residue, and measured noble gases in the separated fractions. Q is most enriched in the fraction AO (2.11–2.16 g/cm^3), suggesting that Saratov Q is different from Allende Q.

Kuhlman K. R. Poplawsky J. D. Hiroi T. Baba K.
Atom Probe Tomography and Visible/Near-Infrared Spectral Analysis of Simulated Solar Wind Hydrogen Implanted Olivine **[#5034]**
We present the results of the first atom probe tomography (APT) and visible/near-infrared (VNIR) spectral study of a sample of San Carlos olivine (Fo90.1) exposed to simulated space weathering due to hydrogen at solar wind energy (~1keV/amu).

ORGANICS IN METEORITES: SOURCES, DISTRIBUTIONS, AND EVOLUTION

Chan Q. H. S. Zolensky M. E. Tsuchiyama A. Martinez J. E.
Magnetite Surface Provides Prebiotic Homochiral Selectivity **[#5179]**
EBSD data show variations in crystal orientation across the stack of discs within a magnetite plaquette which provide a mechanism for a rotational relationship. We will discuss how magnetite may influence the formation of chiral organic molecules.

Sandford S. A. Nuevo M. Materese C. K.
Search for Sugars and Related Compounds in Residues Produced from the UV Irradiation of Astrophysical Ice Analogs **[#5142]**
We report on sugars and related compounds produced by the UV irradiation of astrophysical ice analogs and compare them to similar compounds seen in meteorites.

Giese C.-C. ten Kate I. L. Geisler T. King H. Lenting C. Plu?mper O. Tielens A. G. G. M.
Experimentally Studying Aqueous Alteration of Polycyclic Aromatic Hydrocarbons in Meteorites — First Results **[#5199]**
In this study we have investigated whether aqueous mineral alteration can result in polycyclic aromatic hydrocarbon alteration by simulating conditions in carbonaceous chondrites in several experiment series.

Chan Q. H. S. Zolensky M. E. Fries M.
Organo-Carbonate Association in Carbonaceous Chondrites **[#5138]**
With the use of micro-Raman spectroscopy we discuss the nucleation rate of carbonates in selected CMs, the evolution of organics as influenced by aqueous processing, and whether carbonate is an effective medium for concentration of organic matter.

Peeters Z. Liebig B. Lee T.
Organic Matter Inclusions in CM2 Chondrite Murchison **[#5364]**
Large (~10 μm) inclusions of pure organic carbon exist in carbonaceous chondrites. We extracted organic inclusions from Murchison, a CM2, and analyzed the sections using XANES, TEM, and nanoSIMS. The results are compared to previous results of CRs.

Yesiltas M. Kebukawa Y.
Organic and Mineral Correlations in Tagish Lake via High Spatial Resolution Synchrotron-Based FTIR Microspectroscopy **[#5070]**
We have investigated multiple Tagish Lake grains with synchrotron-based high spatial resolution FTIR microspectroscopy. This technique revealed i) 2D infrared maps, and ii) spatial relationships of organics and minerals in situ.

Fries M. Christou A. Archer D. Conrad P. Cooke W. Eigenbrode J. ten Kate I. L. Matney M. Niles P. Sykes M. Steele A. Treiman A.
A Meteor Shower Origin for Martian Methane **[#5286]**
We present and discuss the hypothesis that martian methane arises from a meteor shower source. Infall material produces methane by UV photolysis, generating localized plumes that occur after Mars/comet orbit interactions. This hypothesis is testable.

Britt D. T. Beltran E.
A Cautionary Tale About Volatile-Rich Carbonaceous Chondrites **[#5198]**
The organic component of volatile-rich carbonaceous chondrite meteorites are primarily in the form of polycyclic aromatic hydrocarbons (PAHs). While PAHs are common in the environment, many species of PAHs are either toxic or carcinogenic or both.

IRON AND STONY-IRON METEORITES: NEW METEORITES AND DISCOVERIES

Zucolotto M. E. Carvalho W. P. Tosi A. Mendes J. C.
Faina, a New Brazilian Plessitic Octahedrite from Group IAB **[#5382]**
A single mass with a total weight of 440 grams was found by Mr. G. Rodrigues in 2011 when digging a hole for the septic tank of his house, suspecting to be a meteorite by having seen our divulgation program at a TV show.

Hamann C. Van Roosbroek N. Greshake A. Pittarello L. Hecht L. Debaille V. Wirth R. Claeys Ph.
Occurrence of Siliceous Impact Melt in Netschaëvo IIE? A FIB-TEM Study **[#5117]**
A silicate inclusion in a sample of the Netschaëvo IIE iron meteorite was studied with FIB-TEM. We present petrographic features indicating that this inclusion is quenched impact melt and suggest that Netschaëvo is an impact melt breccia.

Vantin E. Cuadros F. A. Buhn B. Matteini M. Hauser N.
Mineral Chemistry of the Sanclerlândia Iron Meteorite-Brazil **[#5099]**
The Sanclerlândia iron meteorite from Goiás, Brazil is classified as a medium octahedrite. The chemical characterization of kamacite and taenite with different textural relationships as well as other minerals by EPMA was performed.

Wang L. Y. Hsu W. B.
A Preliminary Study on the Gabbroic Clast of Youxi Mesosiderite **[#5228]**
Gabbroic clast of Youxi is composed of pyroxene and plagioclase. It is similar but not identical to Moama cumulate eucrites. The original magma compositions of gabbroic clast may be similar to the parent magmas of the cumulate eucrites.

Nunes G. A. da Costa A. R.
Comparation Between Thermal Treatments of Itutinga Meteorite Fragments **[#5330]**
The iron meteorite Itutinga (IIIAB, Om) were subjected to thermals treatments in different temperatures (900°C and 1350°C), the usual technique in the field of metallurgical and materials engineering.

ACHONDRITES: EARLY PLANETARY PROCESSES AND EVOLUTION

Harvey R. P.
Parent Body Venus: A Primer for Meteorite Researchers **[#5036]**
A brief description of the most recent ideas concerning Venus surface materials based on lander and orbital data, models of crustal evolution and laboratory experiments.

Goodrich C. A. Mikouchi T. Treiman A. H.
A Volcanic (Quenched) Angrite Clast in Polymict Ureilite DaG 319 **[#5048]**
Polymict ureilites contain foreign clasts, including angrites. Previously reported angrite clasts are of the plutonic variety. We describe a clast of a volcanic angrite in DaG 319. It shows new features compared with known volcanic angrites.

Lorenz C. A. Brandstätter F. Kononkova N. N.
Aenigmatite Mineralization in the fragment of the Dag 1064 Polymict Ureilite **[#5345]**
Aenigmatite was found in the glassy veinlet crossing the augite fragment of DAG 1064 polymict ureilite. The fragment is exotic and is different by the phase compositions from aenigmatite-bearing fragments described in the meteorites before.

Tkalcec B. J. Brenker F. E.
Plastic Deformation on the Ureilite Parent Body Revealed by Structural Analysis of Dunitic Ureilite NWA 7630 **[#5351]**
Evidence for solid-state plastic deformation in the dunitic ureilite NWA 7630 indicates the occurrence of shear deformation on the ureilite parent body. Shear deformation on the ureilite parent body may have been a contributory factor in core formation.

Chen H. Y. Miao B. K. Huang L. L.
Ancient Silicification on Asteroid 4 Vesta: Evidence from a Eucrite Grove Mountains(GRV)13001 from Antarctic **[#5003]**
GRV13001 is a new eucrite collected by CHINARE, which has complex silica metasomatism. The thermal equilibration is likely related to multi-stage magmatism that contributes both the heat and the source of silica fluid and sulfur vapor.

Lunning N. G. Hahn T. M. Beck A. W. McSween H. Y. Jr.
Lithologic Mapping of Howardites: How Many Thin Sections are Enough? **[#5071]**
Quantitative lithologic (modal) mapping of howardite thin sections is a powerful tool for examining the diversity and distribution of material within and between howardites. This poster will compare lithologic maps from multiple howardite studies.

Mittlefehldt D. W. Peng Z. X.
Petrology of Anomalous Eucrite QUE 94484 **[#5342]**
Now this is expected behavior: Duck submitting an abstract to an achondrite session. We will present the results of our petrologic study of anomalous basaltic eucrite QUE 94484.

Guan Y. Wang Y. Hsu W. Eiler J. M.
SIMS Analysis of OH and D/H of Apatites from Eucrites **[#5376]**
SIMS analyses of OH and D/H of apatites from eucrites indicate that significant amounts of water was involved in the early evolution of planetary bodies, such as Vesta, in the asteroid belts.

Irving A. J. Kuehner S. M. Ziegler K.
Petrology and Oxygen Isotopic Composition of Orthopyroxenitic Achondrite Northwest Africa 8777 and Sodic Ultramafic Achondrite Northwest Africa 10132 **[#5254]**
NWA 8777 is an olivine-poor pyroxenite containing calcic plagioclase. NWA 10132 is an albite-bearing harzburgitic achondrite related to NWA 6704.

DEVELOPMENTS IN ADVANCED TECHNIQUES FOR METEORITE AND RETURNED SAMPLE ANALYSIS

Souders A. K. Yin Q.-Z. Amelin Y.
Exploring the Limits of Hf Isotopic Analysis by Single-Collector, Sector Field ICP-MS **[#5168]**
A new solution ICP-MS technique to measure Hf isotope compositions in materials with low (<< ng/g) Hf concentrations.

Dunn T. L.
Classification of Chondritic Meteorites Using Micro-XRF Spectroscopy **[#5378]**
Here we examine micro-XRF spectroscopy as a new tool in classification of chondritic meteorites.

Nagaoka H. Hasebe N. Kusano H. Naito M. Shibamura E. Kuno H. Kim K. J.
Lopes J. A. M. Martínez-Frías J.
Current Status of Development for Active X-Ray Fluorescence Spectrometer for Future Planetary Missions **[#5182]**
We report current status of development for Active X-ray Spectrometer for the embarkation to future planetary roving and/or sample-returned missions.

Fries M. Calaways M. Evans C. McCubbin F.
Advanced Curation: Solving Current and Future Sample Return Problems **[#5379]**
Advanced Curation is a wide-ranging and comprehensive research and development effort at NASA Johnson Space Center that identifies and remediates sample related issues.

Hildebrand A. R. Hanton L. T. J. Rankin M. Ibrahim M. I.
An Asteroid Regolith Simulant for Hydrated Carbonaceous Chondrite Lithologies (HCCL-1) **[#5368]**
Physical properties are described of a simulant (HCCL-1) manufactured to represent carbonaceous asteroid surface regoliths for testing arfificial activities such as sampling, or both natural and artificial impact and explosion responses.

EXPOSURE HISTORY AND DELIVERY OF METEORITES FROM ASTEROIDS, MARS, AND THE MOON, FROM FALLS, FINDS, AND RECOVERIES

Roberts R. V. Gaffey M. J. Fieber-Beyer S. K.
Is the Gefion Dynamical Asteroid Family the Source of the L-Chondrites? **[#5073]**
Data reduction and analysis of VNIR spectra from 11 Gefion family asteroids reveal a diverse mix of lithologies and that most of the sampled Gefion family asteroids do not have L-chondrite compositions.

Nagao K. Haba M. K. Lee J. I. Kim T. Lee M. J.
Noble Gases of the Jinju (H5) Meteorite Fell on March 9, 2014, in Korea **[#5027]**
Noble gas compositions of the Jinju meteorite that fell in Korea show relatively short cosmic-ray exposure age of (2–3) My, almost perfect retention of radiogenic ^{4}He and ^{40}Ar for about 4.0 Gy, and support the petrologic classification of H5.

Beard S. P. Swindle T. D.
^{21}Ne Cosmic-Ray Exposure Ages of Ureilites **[#5305]**
It is unclear whether ureilites represent primitive or differentiated materials. In order to further constrain the origin of ureilites, we investigate possible relationships of CRE ages with other parameters.

Roth A. S. G. Metzler K. Hofmann B. Leya I.
Neon Produced by Solar Cosmic Rays in Chondrites with Small Pre-Atmospheric Sizes **[#5234]**
Solar-cosmic-ray-produced Ne is rather uncommon among meteorites from our collections but - surprisingly - more frequently found in rare meteorite classes. Here we postulate that this observation is actually the result of a sampling bias.

Markley M. M. Kletetschka G.
Nanophase Iron Production Through Laser Irradiation: Space Weathering Analog **[#5011]**
Magnetic observations of laser irradiated olivine provide a record of the sizes and populations of nanophase iron. These variances can be used as a measure of space weathering and forward modelling the spectral changes due to the iron.

Smith T. Leya I.
The Xenon-129 Concentrations in Troilite Inclusions of Iron Meteorites **[#5203]**
Seven troilite samples have been separated from four different iron meteorites and analyzed for their noble gas concentrations. Here we present the xenon isotopic ratios and xenon-129 concentrations.

Li Y. Li X. Y. Wu Y. X. Sr. Li S. J. Wang S. J.
Irradiation of Anorthite by Iron Ions-A Simulation of the Solar Wind Origin of Nanophase Iron in Lunar Soil **[#5246]**
We present a simulant study of the origin of nanophase iron particles that implanted into the lunar soil particles by solar wind. Iron, ferroferric oxide and ferric oxide were identified and their origins were discussed.

Galloway M. J. Sansom E. K. Bland P. A.
Automating Sub-Pixel Fireball Position Identification in Long Exposure Digital Images **[#5160]**
We propose an automated method for finding fireball trajectory positions in long exposure digital images with sub-pixel precision, for a large scale multi-camera meteor observation network.

Jenniskens P. Harlan S. Zolensky M. Yin Q.-Z. Verosub K. L. Jull A. J.
Meteorites Found on Misfits Flat Dry Lake **[#5140]**
We report the discovery of meteorites along the northern shore of the Misfits Flat dry lake near Stagecoach, NV. The first meteorite was found by Scott Harlan of Salinas, CA, on Sept. 22, 2013. In 18 subsequent visits, 57 more stones were found.

Dos Santos E. Scorzelli R. B. De Avillez R. R. Pourkhorsandi H. Rochette P. Gattacceca J.
Weathering Effects on Ordinary Chondrites from the Lut Desert (Iran) Studied by ^{57}Fe Mössbauer Spectroscopy **[#5076]**
The Lut Desert (Iran) is a high-potential region for preserving large concentrations of meteorites. In this work, we will apply ^{57}Fe Mössbauer spectroscopy to investigate weathering in ordinary chondrites collected in different areas from Lut Desert.

Hsu W. Wang K.
A Massive Iron Meteorite Shower Over Northwest of China **[#5087]**
Two massive iron meteorites were recently found in the vicinity of Armanty.

Bischoff A. Ebert S. Patzek M. Horstmann M. Pack A. Barrat J.-A. Decker S.
New Individuals from the Almahata Sitta Strewn Field: Old Friends and Brand-New Fellows **[#5092]**
Nine new samples (MS-MU-012–MS-MU-020) from the Almahata Sitta strewn field were studied including ureilitic samples, chondrites, and a unique sample (MS-MU-019). Among these MS-MU-012 is an unbrecciated, ureilitic feldspar-olivine-pyroxene rock.

Hruba J. Kletetschka G.
Melting and Freezing of Ice in Relation to Iron Oxidation of Meteorites **[#5093]**
Meteorites discovered in the Antarctic ice sheet are better preserved than specimens elsewhere as the ice protects them. But ice or snow adhering to their surfaces may melt or sublimate directly on them, which may cause their oxidation.

Yakovlev G. A. Oshtrakh M. I.
Surface Weathering Products of Dronino Iron Meteorite Fragment: A Study Using Mössbauer Spectroscopy with a High Velocity Resolution **[#5109]**
Re-examination of the surface weathering products of Dronino iron meteorite fragment was carried out using Mössbauer spectroscopy with a high velocity resolution.

Chennaoui Aoudjehane H. Hewins R. Zanda B. Gattacceca J. Devouard B. Jambon A.
Tinajdad, the Latest 2014 Moroccan Fall, a Ni-Rich H5 **[#5195]**
In this abstract, a description of the latest September 2014 fall reported in the south of Morocco is given. Only one piece has been recovered, it's a Ni- rich H5.

Chennaoui Aoudjehane H. Agee C. B. Irving A. J. Garvie L. A. J. Ziegler K. Jambon A. Weber P.
Tirhert — July 2014 — Eucrite Fall in Morocco **[#5197]**
Tirhert is the latest eucrite fall reported in Morocco on July 2014 in Foum Al Hisn area. A fieldwork has been conducted to document the fall and limit the strewnfield. The meteorite has been found immediately the day after the fall.

Zucolotto M. E. Monteiro F. A.
Results of an Intensive Brazilian Divulgation Program Involving Amateur Astronomers and Students **[#5391]**
Brazil has a very few number of meteorites comparing with its continental size, holding only 55 meteorites at 2009 when our divulgation program received the first financial supports. Now there are 77 approved meteorites.

Alexander E. C. Jr. Kracher A. Wasson J. T. von der Handt A.
The Minnesota Meteorite Mystery: Two Unrelated Very Flat Irons **[#5231]**
Two iron meteorites of similar unusual shape but different chemical composition have been found within ~3 km of each other. We investigate possible reasons for this coincidence.

Moggi Cecchi V. Caporali S. Pratesi G.
DaG 1066: A Newfound Anomalous Ureilite with Chondritic Inclusions **[#5252]**
General description, textural, and compositional features of the polymict ureilite DaG 1066, recovered in 1999 in Libya, are provided. The meteorite contains various inclusions, among which almost pure forsterite and enstatite-bearing chondrules.

Righter K. Satterwhite C. E. Schutt J.
Updates on Pairing Issues with the US Antarctic Meteorite Collection **[#5266]**
We examine a few pairing groups in the US Antarctic meteorite collection with known issues and give an update on some of the larger or more significant pairing groups.

Wimmer K. Gnos E. Heinlein D. Hofmann B.
A Fireball from an Aten Type Orbit Over Germany and Switzerland **[#5355]**
A fireball with a remarkably flat slope trajectory crossed Germany and Switzerland on March 15, 2015. Trajectory and strewn field could be derived from multiple fotografic, video and seismic records. The meteoroid originates from an Aten type orbit.

Bryson K. L. Agrawal P. Ostrowski D. R. Sears D. W. G.
Fracture Characterization of Meteorites **[#5361]**
NASA ARC has been tasked with understanding the behavior of ~100m asteroids entering the atmosphere and quantifying the impact hazard. As part of this task, we report the initial results of a survey of the fracture properties of meteorites.

Ostrowski D. Sears D. W. G. Bryson K. Agrawal P.
Physical Properties of Meteorite Falls in Relation to Planetary Defense **[#5363]**
NASA ARC has set up a new lab to study a suite of physical properties of all types of meteorite falls. This is aide to the Planetary Defense initiative at Ames in determining how to deflect or the impact outcome of potentially hazardous bodies.

Ustinova G. K.
Two Approaches to Studying Cosmogenic Radionuclides in Chondrites **[#5022]**
Two approaches to studying (using) cosmogenic radionuclides in chondrites are considered. The preference of that, which compares the measured cosmogenic radionuclide production rates with the calculated ones at the GCR intensity at 1 AU is explained.

Chennaoui Aoudjehane H. Jambon A.
Meteorite Falls in Morocco During the Last Decade: An Overview **[#5186]**
A statistics study of meteorite falls in Morocco during the last decade comparing to some other countries in the word. The number of falls in Morocco during this period is higher than any other place in the word.

Schmitz B.
The Meteorite Flux to Earth Through the Phanerozoic Eon — The First Results **[#5323]**
Extraterrestrial spinels in slowly formed marine sediments can link the history of earth's biosphere, tectonics and climate to the history of the asteroid belt and the solar system.

Schmitz B. Yin Q.-Z. Sanborn M. E. Tassinari M.
Chromium Isotopes in Ordovician Fossil Meteorites and the Quest for the Impactor that Broke Up the L-Chondrite Parent Body **[#5037]**
In the search for fossil meteorites in a quarry in Ordovician limestone a meteorite has been found that does not match any presently known meteorite type. It can be a piece of the impactor that broke up the L-chondrite parent body 470 Ma ago.

Klinova S. V. Yakovlev G. A. Firsov N. N. Grokhovsky V. I.
Microbiological Influence of Phototrophic Bacteria on Meteorites In Vitro **[#5210]**
Microbiological influence of phototrophic bacteria on various meteorites in vitro is investigated.

MARS EXPLORATION AND MARTIAN METEORITES: PETROLOGY, GEOCHEMISTRY, AND WATER-ROCK INTERACTION

Busemann H. Seiler S. Wieler R. Kuga M. Maden C. Irving A. J. Clay P. L. Joy K. H.
Martian Noble Gases in Recently Found Shergottites, Nakhlites, and Breccia Northwest Africa 8114 **[#5235]**
New noble gas data for several recently found martian meteorites will be presented to determine cosmic-ray exposure ages and source pairing. The presence of trapped (atmospheric) components and discrepancies to earlier data sets will be discussed.

Takenouchi A. Mikouchi T.
Olivine Darkening and Shock Textures in ALH 77005 Lherzolitic Shergottite **[#5171]**
We observed darkened olivine in ALH 77005 and compared them to those in other lherzolitic shergottites, all of which were probably ejected by the same impact. Variable features in darkened olivine have a potential to constrain unique shock histories.

Lee M. R. Chatzitheodoridis E.
Formation of Berthierine in the Martian Meteorite Nakhla by Replacement of Aluminosilicate Glass **[#5219]**
We have found the Al-Fe serpentine mineral berthierine in the nakhlite meteorite Nakhla, which has formed by water-mediated replacement of glass within an olivine-hosted melt inclusion.

Hicks L. J. Bridges J. C.
Siderite Precipitated in the Nakhlite Meteorites: Early Formed Precipitates from a Hydrothermal Brine **[#5290]**
Siderite carbonate is present in three of the nakhlites — occurring in olivine fractures and also in the mesostasis of two of these. The compositions in both settings require formation from dissolution of mixed minerals in the nakhlites.

Liu Y. Ma C. Beckett J.
Hydrothermal Alteration of Martian Zircons in NWA 7034/7533 **[#5080]**
Alteration features in zircons in NWA 7034/7533.

Bridges J. C. Schwenzer S. P. Leveille R. Wiens R. C. McAdam A. Conrad P. Kelley S. P.
Hematite Indicator of High Water to Rock Ratio Alteration in Gale Crater **[#5293]**
Through our modelling of Gale Crater mineral and rock compositions, the Hematite Ridge outcrop is predicted to be the result of near surface, high W/R weathering, providing a new type of ancient environment for the Curiosity Rover to study.

Bishop J. L. Velbel M. A. Filiberto J.
Determining Martian Aqueous Mineralogy Through Analyses of Orbital Remote Sensing and Martian Meteorite Geochemistry **[#5113]**
We are investigating similarities and differences in the aqueous mineralogy of Mars determined both from meteorites and the surface in order to provide insights into Mars' geologic history.

Hausrath E. M. Gainey S. R. Bartlett C. L. Adcock C. T.
Primary and Secondary Minerals in Meteorites Shed Light on the Habitability of Mars **[#5262]**
Primary and secondary minerals in meteorites record environmental conditions and potential nutrient availability. We present results interpreting these mineral assemblages with implications for the potential habitability of Mars.

Danielson L. R. Righter K. Waeselmann N. Humayun M.
Majorite-Garnet Partitioning of the Highly Siderophile Elements: New Results and Application to Mars **[#5343]**
Highly siderophile elements in martian mantle reservoirs exhibit both super- and sub-chondritic HSE ratios, which may be fractionated by deep mantle phases. We present new majorite/melt partitioning data for the HSE and other siderophile elements.

Breton H. Lee M. R.
Low-Ca Pyroxenes in the NWA 998 Nakhlite Meteorite: Reactive Products of Olivine-Plagioclase Mineral Assemblage **[#5111]**
Here, we investigate the development of reactive low-Ca pyroxenes by partial consumption of olivine and plagioclase during late-stage igneous processes.

Caseres J. R. Liu Y. Guan Y. Chen Y. Ma C. Howarth G. Taylor L. A.
Trace Element Chemistry of Larkman Nunatuk (LAR) 12011, a New Olivine-Phyric Shergottite **[#5357]**
We examine the trace element geochemistry of major phases and melt inclusions in LAR12011, and implications for crystallization history.

Tait K. T. Irving A. J. Kuehner S. M. Andreasen R. Righter M. Lapen T. J. Gregory D. A.
Petrology, Mineralogy, and Radiogenic Isotopic Composition of Enriched Mafic Shergottite Northwest Africa 10134 **[#5303]**
Northwest Africa 10134 is a new enriched shergottite from the Royal Ontario Museum's meteorite collection. A combined isotopic, petrographic and mineralogical study on the meteorite will be discussed.

Humayun M. Crowther S. A.
Elemental Volatility During Vacuum Melting of Martian Meteorite NWA 8114 **[#5313]**
We show that vacuum melting of basaltic rocks results in severe depletion of U from silicate melts, comparable to Zn, quite contrary to its refractory behavior under reducing conditions.

Chen Y. Liu Y. Guan Y. Ma C.
New Rock Types from Mars: Trace Element Signatures in NWA 7034 Clasts **[#5239]**
This study investigates the concentrations of rare earth elements in feldspars, pyroxenes, and apatites in igneous clasts in NWA 7034, and suggests that the clasts were derived from a primitive mantle source.

Stephen N. R. Dijkstra A. H.
Constraining Pigeonite on Mars; Further Developments in Resolving Zoned Pyroxenes Within the Martian Meteorites **[#5394]**
Developments in SEM techniques allowed accurate measurement of pigeonite using EDS to define EBSD patterns, thus constrain orientation profiles previously unresolved; implicating spectral studies as crystallographic orientation affects mineral spectra.

Clark B. C.
Searching for the Meteoritic Contribution to Martian Soils and Sediments **[#5044]**
Martian soils and surface sediments will contain contributions from meteoritic (and IDP) input, with multiple important consequences. Determination of this input must interpret in situ measurements which focus on trace elements and evolved gases.

Beaty D. W. Hays L. E. Williford K. Farley K.
Sample Science Input to Landing Site Selection for Mars 2020: An In-Situ Exploration and Sample Caching Rover **[#5340]**
This abstract describes the need for sample-related inputs to the Mars-2020 landing site selection process.

Beaty D. W. Niles P. B. Bass D. S. Bell M. S. Bleacher J. E. Cabrol N. A. Eppler D. B. Hamilton V. E. Hays L. E. Head J. W. Kahre M. A. Levy J. S. Lyons T. W. Macalady J. L. Rafkin S. C. R. Rice J. W. Rice M. S.
Planning Ahead for Mars Sample Science in the Human Exploration Era **[#5335]**
This presentation summarizes some advance planning for the sample-related science that may be accomplished by a human mission to the martian surface.

ORDINARY CHONDRITES: COMPOSITIONS, PHYSICAL PROPERTIES, AND CHELYABINSK CHONDRITE

Xu L. Hu S.
Primitive Properties of the Heyetang L3 Chondrite **[#5163]**
We report the petrographical study of the Heyetang meteorite. According to the PMD values of Fa and Fs contents, it was classified as L3.4. The primitive property of the meteorite was confirmed by the presence of many taenite inclusions in kamacite.

Ruzicka A. M. Hutson M. Friedrich J. M. Bland P. A. Pugh R.
Northwest Africa 8709: A Rare but Revealing Type 3 Ordinary Chondrite Melt Breccia **[#5348]**
We discuss the discovery of a rare L3 melt breccia, which has implications for compaction processes that must have contributed to the lithification of what are expected to have been initially porous primordial chondritic agglomerates.

Ziegler K. Irving A. J. Kuehner S. M. Sipiera P. P.
Anomalous Oxygen Isotopic Compositions of Unequilibrated but Supposedly Ordinary Chondrites, Including Ungrouped Silica-Bearing Chondrite Jiddat Al Harasis 846 **[#5052]**
JaH 846 has many features suggestive of an UOC. It is unusual in having silica and opx in chondrules, and in oxygen isotopic compositions that plot beyond ($\delta^{18}O$) and below ($\delta^{17}O$) the ranges for OCs. We conclude it derived from a unique parent body.

Gilmour C. M. Herd C. D. K.
In Situ Analysis of Platinum Group Elements in Ordinary Chondrite Kamacite **[#5336]**
We investigate the variability of PGEs in ordinary chondrite kamacite grains with the use of laser ablation ICP-MS.

Voropaev S. Kocherov A. Gabitov R.
Comparative Analysis of Micrograins from Asteroid 25143 (Itokawa) and Chelyabinsk Meteorite **[#5012]**
We compare data concerning dust particles delivered by Hayabusa from the surface of the asteroid Itokawa and rock fragments of the Chelyabinsk meteorite. It is shown that they are LL ordinary chondrites with similar genesis and parent bodies.

Grokhovsky V. I. Brusnitsyna E. V. Yakovlev G. A.
Haxonite in Chelyabinsk LL5 Meteorite **[#5272]**
Haxonite was found in Chelyabinsk LL5 meteorite.

Sharygin V. V. Grokhovsky V. I. Yakovlev G. A.
Mineral Condensates in Black Lithology of Chelyabinsk Chondrite **[#5274]**
Rounded and shrank vugs with idiomorphic minerals on the walls were found in black lithology. These vugs were possibly formed by the gas condensation.

Weinstein I. A. Vokhmintsev A. S. Ishchenko A. V. Grokhovsky V. I.
High-Dose Induced Thermoluminescence of Light-Colored Lithology in Chelyabinsk Meteorite **[#5175]**
This work presents the study results of high-dose irradiation effects on the laboratory TL parameters in Chelyabinsk LL5 chondrite fragments with light-colored lithology. Obtained data are analyzed in terms of the general order kinetic formalism.

Maksimova A. A. Petrova E. V. Oshtrakh M. I.
Examination of the Re-Melted Zone of Chelyabinsk LL5 Blackened Fragment Using Mössbauer Spectroscopy with a High Velocity Resolution: Preliminary Results **[#5106]**
Preliminary results of Mössbauer spectroscopy of re-melted blackened fragment of Chelyabinsk LL5 meteorite demonstrated some differences in comparison with fragments with a light lithology.

Vokhmintsev A. S. Weinstein I. A. Grokhovsky V. I.
Luminescence Characterization of Tsarev L5 Chondrite **[#5200]**
This work presents the investigation results of spectral and kinetic properties of Tsarev L5 chondrite using photo- and thermoluminescence techniques. Dose fading estimates for laboratory TL response were fulfilled also.

Consolmagno G. J. Macke R. J.
Low-Temperature Heat Capacity of OC Falls as a Function of Olivine Content **[#5146]**
We have measured heat capacities for 18 ordinary chondrite falls of known olivine content and find a strong correlation between heat capacity and olivine abundance; furthermore, our measurements correlate with models based on meteorite composition.

Molesky M. J. Patmore E. B. Strait M. M.
Measurement of Density and Compression Strength in Meteorites **[#5300]**
A report on compression strength and density values of meteorites.

Li S. J. Wang S. J. Miao B. K. Li X. Y. Li Y. Zeng X. J. Shang Y. L. Xia Z. P.
Densities and Porosity Measurement of Ordinary Chondrites Using Pycnometer-Balloon Vacuum Packing Method **[#5307]**
The grain density, bulk density and porosity of 22 fall ordinary chondrites were reported.

Szurgot M.
Mean Atomic Weight of PuŁtusk Meteorite and H Chondrites **[#5013]**
Mean atomic weight Amean of Pułtusk and fifteen other H chondrites has been determined and analyzed. It was concluded that relationship between Fe/Si atomic ratio and Amean of ordinary chondrites predicts precisely Amean values.

Szurgot M.
Mean Atomic Weight of Chelyabinsk and Olivenza LL5 Chondrites **[#5008]**
Mean atomic weights (Amean) of Chelyabinsk and Olivenza LL5 chondrites have been determined and analysed. Relationship between Fe/Si atomic ratio and mean atomic weight of ordinary chondrites has been established which enables one to predict Amean values.

Łuszczek K. Przylibski T. A.
Chemical Composition of Meteorites as Representative Material for Potential Metallic Resources of Their Parent Bodies **[#5383]**
Since six years at Wrocław University of Technology the research concerning the metals content in different groups of meteorites are carried out. Data for iron meteorites and all chondrites' groups were analyzed so far.

CARBONACEOUS CHONDRITES: HYDROUS AND ANHYDROUS

Patzek M. Bischoff A.
Search and Characterization of Volatile-Rich Clasts in Brecciated Meteorites **[#5057]**
We identified phyllosilicate-rich clasts in eleven brecciated meteorites including chondrites and achondrites. These clasts are unique, but share some similarities to CM and CI meteorites.

Matsumoto M. Tomeoka K. Seto Y. Miyake A. Kiriishi M. Umehara M. Yamamoto Y. Nishio-Hamane D.
Hydrated, Unmetamorphosed Clasts in the NWA 1232 CO3 Carbonaceous Chondrite **[#5058]**
We will present the results of petrographic, SEM, TEM, and SR-XRD studies of the numerous small clasts found in the Northwest Africa1232 CO3 carbonaceous chondrite.

Vaccaro E. King A. J. Najorka J. Starkey N. A. Franchi I. A. Russell S. S.
In-Situ Micro-XRD Comparative Study of MIL 07687 and ALHA77307 Matrix **[#5264]**
We have carried out a comparative study of the matrix of MIL 07687 and ALHA77307 using in-situ micro XRD. In MIL 07687 despite pattern being collected on areas with different degrees of alteration, we observe only small variations in the XRD patterns.

Verdier M. J. Marrocchi Y. Gounelle M.
Calcium Carbonates Oxygen Isotopic Compositions in CM Chondrites **[#5069]**
Study of the oxygen isotopic composition of calcium carbonates in ten CM chondrites and constraints over the isotopic evolution of the fluid with the temperature of precipitation.

Strait M. M. Clayton A. N. Jack S. J. Ruzicka A. M. Flynn G. J. Durda D. D.
Chemical Composition of Artificially Hydrated Ordinary Chondrites **[#5324]**
Chemistry of an artificially hydrated ordinary chondrite to produce a carbonaceous chondrite is reported.

FORMATION OF CHONDRULES AND CHONDRITE PRECURSORS

Wasson J. T. Baecker B. Rubin A. E.
Many Chondrule Melting Events; Multiple Overgrowths in Chondrules and Recycled Grains; Lightning as Heat Source **[#5381]**
Igneously-zoned overgrowths in high-FeO low-Ca pyroxenes in Semarkona record ca. 10 melting events. Melting events varied in intensity, even at distances as short as 20 micrometers. Radiant heating by lightning seems the most suitable heat source.

Baecker B. Rubin A. E. Wasson J. T.
Overgrowth Layers on Pyroxene in an FeO-Rich Porphyritic Chondrule in CO3.0 Y-81020 **[#5082]**
A POP chondrule in CO3.0 Y-81020 contains pyroxene phenocrysts with BSE-dark to BSE-bright overgrowth layers. FeO and CaO gradually increase from the center to the edge of the grains, but exhibit "sawtooth" compositional zoning patterns.

Cervantes-de la Cruz K. E. Segura A. Ortega-Gutiérrez F.
Bar Size Tendency of Barred Olivine Chondrules **[#5380]**
We studied the characteristics of the barred olivine chondrules in the meteorite Nuevo Mercurio.

Hanna R. D. Ketcham R. A.
3D Measurement of Fine-Grained Rims in CM Murchison Using XCT **[#5350]**
We are measuring the 3D geometry and thickness of fine-grained rims (FGRs) around deformed, foliated chondrules to help elucidate the formation mechanism of FGRs and to compare their geometry to the impact-induced foliation in Murchison.

Shah J. Muxworthy A. R. Almeida T. P. Kovács A. Russell S. S. Genge M. J. Dunin-Borkowski R. E.
Visualizing the Magnetic Behavior of Chondrule Dusty Olivine Using Electron Holography **[#5098]**
We present the first off-axis electron holography study of natural dusty olivine in Bishunpur (LL3.1) to investigate its nanoscale rock magnetic properties. We find highly magnetic, multi-vortex domain structures within the dusty olivine kamacite.

Herbst W. Greenwood J. P.
A New Mechanism for Chondrule Formation: Radiative Heating by Hot Planetesimals **[#5020]**
We propose that chondrules are formed by radiative heating of pre-existing clumps of solids in the vicinity of planetesimals with incandescent lava at their surfaces.

Loesche C. Wurm G. Teiser J. Friedrich J. M. Bischoff A. Kelling T. Mac Low M.-M. McNally C. P. Hubbard A. Ebel D. S.
On the Photophoretic Force Exerted on mm- and Sub-mm-Sized Particles **[#5137]**
Photophoresis exerted on chondrules was investigated in drop tower experiments and numerical studies were performed to model the force on realistic particles.

Alexander C. M. O'D.
Where Did the Chondrites Form? **[#5367]**
Chondrite formation distances from the Sun are constrained using N isotopes.

CARBONACEOUS CHONDRITE PARENT BODIES

Sanborn M. E. Yin Q.-Z. Zipfel J. Palme H.
Investigating the Genetic Relationship Between NWA 5492 and GRO 95551 Using High-Precision Chromium Isotopes **[#5159]**
We present the results of high-precision Cr isotopic measurements (i.e., ε^{53}Cr and ε^{54}Cr) of the ungrouped chondrites NWA 5492 and GRO 95551 to investigate a potential genetic link and their origin on a previously unsampled parent body.

Nakamura T. Park J. Ahn I. S. Shirai N. Sekimoto S. Nakato A. Nakashima D. Turrin B. D. Lindsay F. N. Herzog G. F. Delaney J. S. Swisher C. C. III Nagao K.
Depletion of Volatiles and Timing of Heating Recorded in Thermally Metamorphosed Hydrous Carbonaceous Chondrites **[#5147]**
PCA02012, B7904, and Dho735 experienced heating and dehydration. Mineralogical observations, INAA and ^{40}Ar/^{39}Ar analyses were performed to understand effects of heating on the abundance of volatiles and on Ar-Ar age dating.

Yamashita S. Nakamura T. Jogo K. Matsuoka M. Okumura S.
Progressive Changes in Mineralogy, Reflectance Spectra and Water Contents of Experimentally Heated Murchison at 400, 600, and 900°C **[#5154]**
Murchison was experimentally heated in vacuum to understand changes in mineralogy, reflectance spectra and water contents. Negative correlation is found between water contents and 3µm –band strength when corrected for absorbed and rehydrated water.

Lindgren P. Sparkes R. Quirico E. Lee M. R.
Exploring Thermal Processing of the Mildly Aqueously Altered CMs EET 96029 Using Sulphide Mineralogy and Carbon Structure **[#5223]**
The CM2 EET 96029 has undergone very limited aqueous alteration but has also been heated. Thus, aqueous alteration and thermal metamorphism were not necessarily coupled, with important implications for understanding of parent body evolution.

Ma C.
Discovery of Nuwaite, Ni_6GeS_2, a New Alteration Mineral in Allende **[#5151]**
Nuwaite is likely the first solar mineral with high Ge, Sn and Te concentrations. It is a late-stage alteration product, probably derived from a sulfidation process, where Ni-Fe metals react with a low-temperature fluid enriched in S, Ge, Sn and Te.

Fagan T. J. Aoki R.
Evidence from Chondrule Shapes and Modes for Shock Deformation in Reduced CV3 Chondrites Leoville and Efreomovka **[#5174]**
The reduced CV3 chondrites Efremovka and Leoville are characterized by (1) more elongate chondrules, and (2) lower matrix abundances compared to the oxidized CV3 Allende. Both observations can be explained by shock deformation of reduced CV3s.

Almeida N. V. Smith C. L. Sykes D. Downes H. Ahmed F. Russell S. S.
Quantifying the Deformation of Leoville Chondrules in 3D: Implications for the Post-Accretional History of the CV3 Parent Body **[#5112]**
Micro-CT scanning allows for the three-dimensional analysis of both degree of deformation and direction of preferred orientation of chondrules in the Leoville CV3 meteorite, indicating post-accretional impact as the cause for the foliation.

Kuehner S. M. Irving A. J. Ziegler K. Pitt D.
Abundant Chlorapatite Within Anomalous Reduced CV3 Chondrite Northwest Africa 8418 and Paired Stones **[#5244]**
Chlorapatite is unusually abundant within a group of CV3 chondrite stones and as rims on large CAI.

Patmore E. B. Strait M. M. Jack S. J. Flynn G. J. Durda D. D.
Compositional Analysis of Meteorite Disruptions to Find Mineral Makeup **[#5298]**
Description of detector designing process to analyse the mineral makeup of extraterrestrial objects.

Ivanova M. A. Lorenz C. A. Borisovsky S. E. Burmistrov A. Korost D. V.
Korochantsev A. V. Logunova M. N.
The Holotype of Al-Cu-Zn Alloys: Related to Meteorite Material? **[#5311]**
We investigated the holotype sample of khatyrkite and cupalite. Our results confirmed that it is different in chemical composition from all other particles related to the Khatyrka CV3 chondrite and recovered in clay layers of the Khatyrka region.

Kochemasov G. G.
Structural Bifurcation of Debris and Grids on Surfaces of the Churyumov-Gerasimenko Comet and Dwarf Planet Ceres **[#5050]**
Orbits make structures. Tectonic granulations of bodies are inversely proportional to orbital frequencies. Bodies have two wave movements: orbiting and rotation. Modulation of them produces two side frequencies and corresponding visible structures.

Tuesday, July 28, 2015
POSTER SESSION
5:30 p.m. HMMB Floor Two

EARLY SOLAR SYSTEM CHRONOLOGY — A TRIBUTE DEDICATED TO IAN HUTCHEON

Claydon J. L. Elliott T. Coath C. D. Chen H. W. Taylor C. A. Russell S. S.
A Chondrule from the Mokoia (CV3) Chondrite with Anomalously Low ^{26}Mg: Evidence for a Multi-Stage History-* **[#5250]**
MC-ICP-MS measurements of Mg isotopes in chondrule MOK13B reveal that it may have formed from low-Al/Mg material that underwent chemical fractionation to increase Al/Mg after decay of 26-Al, or it may sample a region with anomalous Al or Mg isotopes.

Nagashima K. Krot A. N. Komatsu M.
^{26}Al-^{26}Mg Systematics in Chondrules from Kaba and Yamato 980145 CV3 Chondrites **[#5167]**
We measured Al-Mg systematics of plagioclase in chondrules from two of the least metamorphosed CV chondrites, Kaba and Y-980145. Kaba chondrules show resolvable excesses of δ^{26}Mg*, corresponding to initial (^{26}Al/^{27}Al) ratios of ~5×10^{-6}.

Amelin Y. Koefoed P. Yin Q.-Z. Yamashita K.
Sr Isotopic Systematics of the Allende CAIs A63 and SJ101 **[#5388]**
Allende CAI A63 with well preserved Rb-Sr system yielded initial ^{87}Sr/^{86}Sr of 0.698951 ± 0.000007 and ε^{84}Sr=+0.88 ± 0.14.

CAIS AND OTHER REFRACTORY MATERIALS

Shornikov S. I.
Thermodynamics of Ca-Al-Inclusion's High-Temperature Minerals **[#5017]**
To clarify the effect of temperature on the CAI formation the oxide activities, temperature dependences of partial pressures of vapor species and the gas phase composition over the most refractory CAI minerals were considered at 1600–2500 K.

Mishra R. K. Simon J. I. Ross D. K. Keller L. P. Marhas K. K. Needham A. W.
A Refractory Inclusion in Unequilibrated Ordinary Chondrite (LL3.3) Allan Hills A81251 **[#5139]**
An initial petrologic study of a refractory inclusion in the unequilibrated ordinary chondrite (LL3.3) Allan Hills A81251.

Krot A. N. Nagashima K. Ma C. Wasserburg G. J.
Forsterite-Bearing Type B CAI with a Relict Eringaite-Bearing Ultra-Refractory CAI **[#5308]**
Forsterite-bearing Type B CAI from the Allende CV3 chondrite contains a relict eringaite-bearing ultra-refractory inclusion composed of ^{16}O-rich spinel, Y-bearing perovskite, eringaite [$Ca_3(Sc,Y,Ti)_2Si_3O_{12}$], and Sc-rich pyroxene.

PRESOLAR GRAINS AND ISOTOPIC ANOMALIES

Duprat J. Tatischeff V. de Séréville N.
On the Nucleosynthetic Origin of ^{10}Be in FUN-CAIs **[#5204]**
We investigated the different astrophysical scenarios to explain the ^{10}Be baseline concentration observed in FUN-CAI.

Sanborn M. E. Yin Q.-Z. Schrader D. L.
Aqueous Alteration and Its Effect on ε^{54}Cr: An Investigation of CR1 and CR Chondrites **[#5157]**
We present the results of high-precision Cr isotopic measurements on a suite of CR1 and CR2 chondrites that span a broad range of oxygen isotopic composition and aqueous alteration histories to investigate the effect of alteration on ε^{54}Cr values.

Nittler L. R. Wang J. Alexander C. M. O'D. Hillion F.
High-Spatial-Resolution Chromium Isotopic Measurements of Nano-Oxides from Orgueil **[#5232]**
NanoSIMS search for / Supernova chromium / Better ion source helps.

Zega T. J. Haenecour P. Floss C. Stroud R. M.
Circumstellar Magnetite Identified in the LAP 031117 CO3.0 Chondrite **[#5390]**
We identified presolar magnetite in the LAP 031117 CO3.0 chondrite. We hypothesize that it formed via oxidation of previously condensed metal grains in its host circumstellar envelope.

Lewis J. B. Isheim D. Moutanabbir O. Floss C. Seidman D. N.
Standardization and Correction of Artifacts in Atom-Probe Tomographic Analysis of Allende Nanodiamonds **[#5278]**
We use complementary atom-probe tomography and secondary ion mass spectrometry to measure the $^{12}C/^{13}C$ isotopic ratios of meteoritic nanodiamonds and thus determine their origins. We are investigating and quantifying instrumental artifacts.

Clarke A. Lyon I. C. Henkel T.
Combined TOF-SIMS and NanoSIMS Analysis of Gently Separated Presolar SiC Grains **[#5321]**
Gently separated presolar SiC grains will be analysed in order to gain further understanding of the grain surfaces and coatings. TOF-SIMS and NanoSIMS will be used to provide a detailed analysis of the elemental/isotopic composition and distribution.

MICROSAMPLE ANALYSIS: IDPS, MICROMETEORITES, STARDUST, AND HAYABUSA

Nguyen A. N. Berger E. L. Nakamura-Messenger K. Messenger S.
Sulfur and Oxygen Isotopic Analysis of a Cosmic Symplectite from a Comet Wild 2 Stardust Terminal Particle **[#5375]**
The S isotopic composition of a cosmic symplectite in a Stardust terminal particle is found to be isotopically heavy with a large 33S-enrichment. This mass-independent fractionation likely resulted from photochemical irradiation of solar nebula gas.

White A. J. Ebel D. S. Burchell M. J.
Raman Spectroscopy of Whole Samples in Aerogel Using a Laser Scanning Confocal Microscope **[#5065]**
We have coupled a Raman Spectrometer to a Laser Scanning Confocal Microscope for the pinpointed analysis of fine material in the walls of Stardust tracks.

Croat T. K. Haas B. A. Floss C. Burchell M. J.
Compositional Determination of Surviving Material in Stardust Analog Al Foil Craters **[#5130]**
Surviving material is commonly detected in Stardust Al foil analog craters created by impact of primitive meteorite matrix, and semi-quantitative compositions can be determined that can guide subsequent FIB-TEM studies focused on refractory phases.

Yano H. Yamagishi A. Hashimoto H. Yokobori S. Kebukawa Y. Kawaguchi Y. Kobayashi K. Yabuta H. Tabata M. Higashide M. Tanpopo Project Team
Tanpopo: A New Micrometeoroid Capture and Astrobiology Exposure in LEO: Its First Year Operation and Post-Flight Plan **[#5395]**
Tanpopo conducts micrometeoroid capture with aerogels and microbe exposure for testing quasi-panspermia hypothesis at ISS since May 2015. Samples will be retrieved in 2016–18 for initial analysis at ISAS and detailed analyses at over 25 labs.

Suttle M. D. Van Ginneken M. Genge M. J.
Larkman Nunatak Micrometeorites, a Statistical Study **[#5063]**
A new micrometeorite collection recovered from Antarctic moraine at Larkman Nunatak is characterised and the statistics compared against historical collections, providing insights into the cosmic dust flux and micrometeorite preservation.

Van Ginneken M. Gattacceca J. Rochette P. Sonzogni C. Alexandre A. Genge M. J.
The Parent Body of Large Micrometeorites: An Oxygen Isotopes Approach **[#5116]**
This study focuses on oxygen isotope compositions of micrometeorites from the Atacama desert. By increasing available data and sampling in a new environment compared to other studies, we explore possible biases introduced by localized unusual events.

Starkey N. A. Franchi I. A. Salge T. Brearley A. J.
Advanced SEM-EDX and Isotope Mapping of a Refractory Grain in a Fine-Grained IDP **[#5104]**
We present high spatial resolution SEM-EDX and O isotope mapping to reveal the presence of a melilite-olivine refractory grain in a fine-grained IDP. We use this to discuss transport of material from the inner solar system and formation of comets.

Nakato A. Uesugi M. Karouji Y. Yada T. Hashiguchi M. Matsumoto T. Kumagai K.
Okada T. Abe M.
A Consortium Study for Hayabusa-Returned Samples: Particles Containing Phase that Might Aqueous Alteration Products **[#5191]**
Three Hayabusa-returned particles are introduced as new consortium studies. The particles include Fe-S-Ni phase and Ca-Mg-Na phase, respectively. To maximize scientific gain from the Hayabusa-returned samples, we widely call for the proposal.

Hashiguchi M. Uesugi M. Karouji Y. Yada T. Nakato A. Matsumoto T. Kumagai K.
Okada T. Abe M.
A Consortium Study for Hayabusa-Returned Samples: Silica-Containing Particle **[#5193]**
In this paper, we propose an overview and a tentative research plan for silica-containing particles that is one of the Hayabusa-returned samples, as a new consortium study.

Matsumoto T. Uesugi M. Karouji Y. Nakato A. Hashiguchi M. Yada T. Kumagai K.
Okada T. Abe M.
A Consortium Study for Hayabusa Returned Samples: An Agglutinate Grain **[#5194]**
We describe a consortium particle of an agglutinate grain found in Hayabusa samples and a tentative research plan to identify its origin.

Yada T. Abe M. Uesugi M. Karouji Y. Kumagai K. Nakato A. Okada T. Hashiguchi M. Matsumoto T. Fujimoto M.
Present Status of Initial Descriptions and Distributions of Hayabusa-Returned Samples **[#5215]**
Extraterrestrial Sample Curation Team of JAXA has described >400 Itokawa particles recovered by Hayabusa spacecraft so far. We started the 3rd international announcement of opportunity from this Jan. and will distribute some of them from this Jun.

Genge M. J. Tomkins A. G.
I-Type Cosmic Spherules as Probes of the Upper Atmosphere **[#5042]**
We present new numerical modelling of I-type cosmic spherule formation and observations of modern spherules to show how the metal, wustite and magnetite content of these particles can be used to investigate the composition of the upper atmosphere.

Miura Y.
Formation of Carbon-Rich Grains in Air by Meteoritic Showers of Tke Nio and Chelyabinsk **[#5259]**
Carbon separation and concentration process can be formed at explosions of meteorite shower in air of the Nio (Japan) and Chelyabinsk (Russia) meteorites. Carbon concentration process by meteoritic explosions is an impact above terrestrial surface.

Tuesday, July 28, 2015
POSTER SESSION
5:30 p.m. HMMB Floor Three

PETROLOGY AND GEOCHEMISTRY OF LUNAR ROCKS

Roller G.
A Nuclear Production Ratio Th/U = 0.96 from Lunar and Terrestrial Rocks: Implications for Future Lunar Sample Return Missions **[#5041]**
Based upon findings from lunar rocks, a preliminary nuclear production ratio of = 1 is suggested for element pairs Th/U, Pu/U, Re/Os, Ir/Os and Au/Ir. Hence, the moon could become an astrophysical reference as to r-process isotope and element ratios.

Korotev R. L.
In the Feldspathic Highlands of the Moon, High MgO/FeO Equals High Olivine Abundance **[#5078]**
Highlands of the Moon / MgO to FeO / Olivine goes up.

Muftakhetdinova R. F. Grokhovsky V. I. Yakovlev G. A.
Structure and Composition of Shock Remelting Lunar Metallic Particles **[#5292]**
In this work we investigated structure and composition of shock re-melting lunar metallic particles.

Park J. Nyquist L. E. Herzog G. F. Turrin B. D. Lindsay F. N. Delaney J. S. Swisher C. C. III Shih C.-Y. Yamaguchi A. Shirai N. Ebihara M. Nagao K.
$^{40}Ar/^{39}Ar$ Ages for Lunar Meteorites MIL 090034, MIL 090036, and MIL 090070 and Excess ^{40}Ar in MIL 090036 **[#5237]**
Young ages of ~3500–3540 Ma of MIL 090034, MIL 090036 and MIL 090070 for each breccia probably date the time of breccia assembly. The regolith breccia MIL0 90036 contains excess ^{40}Ar implanted from the lunar atmosphere.

IMPACT CRATERING: MAGNETICS AND PLANETARY-SCALE IMPACTS

Bezaeva N. S. Badyukov D. D. Kars M. Feinberg J. M. Rochette P. Gattacceca J. Raitala J.
Magnetic Properties of Agglutinate-Like Particles from Planar Shock-Recovery Experiments on Basalts **[#5009]**
We conducted planar shock-recovery experiments using a light gas gun and copper projectiles sent to basaltic targets at about 6 km/s. Agglutinate-like particles (ALP) were formed as a result of shock. Here we present the magnetic properties of ALP.

Bezaeva N. S. Demory F. Rochette P. Gattacceca G. Gabriel T. Quesnel Y.
The Effect of Hydrostatic Pressure up to 1.45 GPa on the Morin Transition of Hematite-Bearing Rock: Implications for Martian Crustal Magnetization **[#5016]**
We quantified the effect of hydrostatic pressure up to 1.45 GPa on the Morin transition of hematite-bearing rock via direct magnetic measurements using a high pressure cell and a SQUID magnetometer. Hematite is present in the martian crust.

Essa K. S. Kletetschka G.
Magnetic Anomalies on Mars are Deep Seated **[#5019]**
Magnetic data set from 400 km altitude of Mars is interpreted using SMA method for twelve profiles chosen across significant magnetic regions to estimate the depth and shape. The results demonstrate that the depth varies between 55 km and 227 km.

Echaurren J. C.
Apollo Basin, Moon: Estimation of Impact Conditions **[#5341]**
The Apollo Basin is a, pre-Nectarian, multi-ring basin located within the large South Pole-Aitken Basin (SPA). Multispectral data from both Galileo and Clementine showed that the composition of materials in Apollo is distinct…

Hartmann W. K.
Terminal Cataclysm Epistemology: A Cataclysm that Never Happened? **[#5026]**
The "terminal cataclysm" or "late heavy bombardment," LHB) concept of the last 40 years exhibits curious epistemology, with changing definitions and inconsistent evidence. The classic spike of basin-forming impacts at 3.9 Ga ago is no longer viable.

IMPACT CRATERING: MAPPING, MELTING, SHOCK EFFECTS

Gottwald M. Fritz T. Breit H. Schaettler B. Harris A.
The TanDEM-X DEM — Status of the New Dataset for Studying Topography of the Global Impact Crater Record **[#5004]**
In the TanDEM-X mission two X-band radar satellites were operated as a single-pass SAR interferometer. From the acquired data a new digital elevation model is being generated. We report on the capabilities of this DEM for impact crater studies.

Hauser N. Guimarães E. Velcic M. do Carmo D. de Almeida T. Garnier J. Vieira L. C. Valadares G. C. F. Brandão M. V. Adorno R. R. de Araujo M. C. Pereira M. G. Guerra A. Cunha S. Silva K. S. Rocha M. G. von Glehn A. Araújo T. Carneiro J. de Oliveira D. E. M. Citon R. T. P. Dantas R. Ferreira L. V. R. Yokoyama E. Reimold W. U.
A New, Improved Map of the Araguainha Dome Impact Structure, Central Brazil **[#5096]**
Araguainha Dome (~40 km diameter), is the largest impact structure known in South America. In 2012, as part of the annual fifth year UnB students´ final mapping course, 15 undergraduate students of Brasilia University remapped the structure.

Sahoui R. Belhai D.
Ouarkziz Impact Structure, Algeria: Preliminary Petrographic and Geochemical Studies **[#5081]**
Ouarkziz impact crater in Algeria is set in Namurian lower limestone and marls with gypsum. We present here preliminary petrographic and geochemical studies of the rocks and breccias forming the rings ans the central area of the structure.

Mahmood S. S. Jarret S. J. Sessa J. A. Bigolski J. N. Aldoroty R. J. Ebel D. S. Landman N. H.
Presence of Shocked Quartz at Two Cretaceous / Paleogene (K/Pg) Sites in the New Jersey Coastal Plain **[#5329]**
Upon re-observation of samples collected at the chemo stratigraphic boundary of the Agony Creek (30m paleodepth) and Crosswicks Creek (100m paleodepth) shocked quartz was found confirming their status as K/Pg sites.

Krzesińska A. M. Wirth R. Kusiak M. A.
Shock and Annealing Record in Zakłodzie Enstatite Meteorite **[#5229]**
TEM observation of striated enstatite in Zakłodzie shows that meteorite was severely shocked, impact melted and annealed due to burial in deep, warm ejecta on the chondritic parent body.

Jaret S. J. Cai Y. Hemming S. R. Rasbury E. T. Winslow F. D. Thompson L. M. Glotch T. D.
A Comparison of Argon Ages of Manicouagan Impact Melt and Solid-State Maskelynite **[#5221]**
Argon isotopes / Are partially reset at / Manicouagan.

Xie Z. Zuo S.
Partial Transformed High Pressure Phases in Shocked-Induced Melt Vein of Antarctic GRV Meteorites **[#5169]**
The study focus on partial solid-state transformation of major minerals in shock-induced melt veins of Antarctic GRV chondrites. The goal is to better elucidate mechanism of partial transformation, Mg-Fe diffusion, and estimate the shock duration.

El Kerni H. Chennaoui Aoudjehane H. Reimold W. U. Koeberl C. Baratoux D.
Bouley S. Aoudjehane M.
Agoudal Shatter Cones (High-Atlas, Morocco) — Constraints on Erosion of an Associated Impact Crater **[#5122]**
While some researchers assume that the formation of the Agoudal shatter cones is related to the fall of the iron meteorites found in the vicinity, our group prefers the interpretation that the two are not genetically linked.

Wilk J. Kenkmann T.
Formation of Shatter Cones in the MEMIN Impact Experiments **[#5102]**
We recovered shatter cone fragments from the MEMIN cratering experiments in sandstone, quartzite and limestone blocks. We analyzed the conical to hyperboloid, curved and striated fracture surfaces with SEM, WLI and produced µm-accurate 3D models.

Bertoglio O.
On the Role of Shock Wave Reflections in Impact Cratering **[#5047]**
When the downward impact shockwave meets a rock discontinuity, an upward reflected pressure wave is created. When travelling through the crater fill deposits, this wave projects upwards the shattered rocks which so may contribute to the rim creation.

Xie Z. Zuo S. Wang H.
Fe-Rich Spherules Bearing Angular Quartzes of Taihu Lake: Possible Fallout of Eject Plumes **[#5183]**
Fe-rich spherules bearing angular quartes are dispersed in a specific mud layer of Taihu Lake dated as 7500 BP, are products of aggreation of shattered angular quartz fragments and fine materials, possible fallout of an eject plume by an airburst.

Harris T. H. S.
Tektite Suborbital Science **[#5135]**
The australite fall sites in S. Australia at 10 km/s require loft times of 7.5 hrs from Indochina and 112.5 deg Earth spin, inconsistent with a launch from that same hemisphere. Alternative AA source regions must explain these imprint elements.

Harris T. H. S.
Tektite Process Constraints **[#5053]**
Shock accounts for only half of "australite" tektites 10 km/s morphologically derived speed. 5,000 m/s delta V remains unaccounted. In perspective, this is equivalent to ~50 years of geosynchronous station keeping budget, and 3/4 of the tektite's KE.

Koeberl C. Nishiizumi K. Caffee M. W. Glass B. P.
Beryllium-10 in Individual Australasian Microtektites and Origin of Tektites **[#5187]**
Be-10 measurements in individual microtektites are reported for the first time, and show high contents, indicating formation early in the impact process (pre-crater-formation).

Van Ginneken M. Genge M. J.
Microtektites from the Larkman Nunatak, Transantarctic Mountains **[#5114]**
We report the discovery of microtektites in glacial moraine from the Larkman Nunatak, Transantarctic Mountains. Major and trace element compositions match those of Australasian microtektites. This discovery could extend the Australian strewnfield.

Wednesday, July 29, 2015
AWARD PRESENTATIONS
8:30 a.m. International House (I-House) Chevron Auditorium

Chairs: **Michael Zolensky**
Trevor Ireland

8:30 a.m. *Award Ceremony*

9:30 a.m. Cuzzi J. N. *
Planetesimal Formation **[#5392]**
Models of meteorite parent body formation accounting for global and temporal evolution of growing particles and their vapor are reviewed. Meteoritical data is assessed for fundamental constraints it can provide on the process.

10:15 a.m. Artemieva N. A. *
The Impact of Numbers **[#5240]**
Smart impact hydrocodes running on modern powerful computers produce billions and billions of numbers in the blink of an eye. To sort them out and to generate new knowledge we have to work in collaboration with geologists, geochemists, seismologists.

Thursday, July 30, 2015
VOLATILES IN THE SOLAR SYSTEM
8:30 a.m. Stanley Hall Room 105

Chairs: **Frederic Moynier**
Henner Busemann

8:30 a.m. Moynier F. * Pringle E. Hezel D.
Zn Isotopes in Chondrites, Chondrules, and Matrix: Origin of the Volatile Element Depletion in Chondrites **[#5205]**
The variations of Zn isotope ratios among carbonaceous chondrites show that the volatile element depletion in solar system material occurred in the solar nebula. We will also present the Zn isotopic composition of chondrules and matrix from carbonaceous chondrites.

8:45 a.m. Wiederhold J. G. Schönbächler M. *
The History of Volatile Elements in the Solar System: Mercury Isotope Systematics in Chondrites and Eucrites **[#5176]**
New Hg isotope and concentration data reveal Hg heterogeneites indicating a multistage evolution for Hg in the analyzed meteorites. The data shows nucleosynthetic homogeneity for Hg isotopes.

9:00 a.m. Williams J. T. * Sharp Z. D. Lewis J. A. Shearer C. K. McCubbin F. M. Agee C. B.
Using Chlorine Isotopes to Track the Composition of Ice Incorporated into Chondrite Parent Bodies **[#5309]**
Evidence for an isotopically light chlorine solar nebula and use of chlorine isotopes as a unique view into the composition of ice incorporated into chondrite parent bodies.

9:15 a.m. Meshik A. P. * Pravdivtseva O. V. Burnett D. S. Hohenberg C. M.
Primitive Terrestrial Xenon: A Relation to Refined Composition of Solar Wind **[#5371]**
Refined xenon isotopic analyses of solar wind delivered by Genesis Mission and experiments demonstrating modification of apparent fission yields due to chemical fractionating of Xe precursors are probably two essential ingredients to understand primordial terrestrial xenon.

9:30 a.m. Gilmour J. D. * Crowther S. A.
Characterising Phase Q and the Q-Process with Iodine and Xenon **[#5255]**
Iodine-xenon systematics constrain the incorporation mechanism and loss during processing of Q-Xe and Xe-P3, and indicate their relationship to one another.

9:45 a.m. Crowther S. A. * Gilmour J. D.
The Iodine-Xenon System In Achondrites **[#5242]**
The geochemical behaviour of Pu, I and Xe contributed to the volatile reservoirs of terrestrial planets. We report I-Xe data from NWA 7325 and compare to other achondrites, which indicate a range of behaviours during early igneous activity.

10:00 a.m. Amari S. * Messenger S. Clemett S. J. Meshik A.
Identification of Q from Saratov (L4) **[#5127]**
We examined organic matter and C and N isotopic ratios in Q-rich fractions from Saratov (L4). We found three spots with $^{14}N/^{15}N$ ratios that are identical to that of Jupiter (435 ± 57), and high N and O contents. We concluded that these spots represent Q.

10:15 a.m. Holinger S. Riebe M. Clay P. L. Gilmour J. D. Ruzie L. Kuga M. Maden C. Busemann H. *
Online Etching of a Neutron-Irradiated Acid-Resistant Residue of Allende — Clues to the Character and Origin of Phase Q? **[#5227]**
The online etching noble gas study of the n-irradiated HF/HCl-residue of Allende yields a late I-Xe age, little Q-gas and a delayed gas release compared to an unirradiated residue run. First data for a larger Vigarano residue might also be presented.

10:30 a.m. Ciesla F. J. * Yokochi R.
Developing Quantitative Models for the Trapping of Noble Gases in Amorphous Ice **[#5072]**
Amorphous ice traps. / But how much does it take in? / Models will tell us.

10:45 a.m. Righter K. * Pando K. M. Danielson L. R.
The Combined Strength of Thermodynamics and Comparative Planetology: Application of Activity Models to Core Formation in Terrestrial Bodies **[#5277]**
We combine our new data on the effect of Si and C on metal-silicate partitioning of volatile elements Ge, In, As, and Sb with previous results to produce a model that can be applied to any terrestrial body.

11:00 a.m. Murty S. V. S. * Ghosh S.
Primordial ($^{40}Ar/^{36}Ar$) Ratio: New Results from Dyalpur Ureilite **[#5024]**
Primordial $^{40}Ar/^{36}Ar$ ratio has been determined from a combustion study of the acid residue of Dyalpur ureilite. Blank has been improved by careful experimentation, which resulted in a value of 1.1*10(E-4) for the primordial value of $^{40}Ar/^{36}Ar$.

11:15 a.m. McCoy T. J. * Bullock E. S.
Volatile-Rich Phases in Aubrites: Clues to Understanding the Mineralogy of Mercury? **[#5280]**
Roedderite, albite and djerfisherite occur in aubrites, hosting Na, K, S and Cl. Albite and djerfisherite have been implicated on Mercury. Does roedderite occur on Mercury as well, requiring peralkaline melts on the innermost planet?

Thursday, July 30, 2015
ACHONDRITES: EARLY PLANETARY PROCESSES AND EVOLUTION
8:30 a.m. Sibley Auditorium

Chairs: **Hilary Downes**
Takashi Mikouchi

8:30 a.m. Pringle E. A. * Savage P. S. Badro J. Barrat J.-A. Moynier F.
Silicon Isotopes in Achondrites and Planetary Accretion and Differentiation **[#5120]**
We present new high-precision Si isotope data for an extended suite of achondrites to assess the processes affecting the Si isotope system during the accretion and early geochemical modification of planetesimals.

8:45 a.m. Mikouchi T. * Sugiyama K. Yasuhara A. Mihira T.
Transmission Electron Microscopy of Silico-Apatite in D'Orbigny **[#5287]**
We studied Ca silico-phosphates in the D'Orbigny quenched angrite by FIB-TEM and found that they are apatite in the crystal structure.

9:00 a.m. Lindsay F. N. * Delaney J. S. Turrin B. D. Park J. Herzog G. F. Swisher C. C. III
$^{40}Ar/^{39}Ar$ Ages of Kapoeta Glasses **[#5304]**
Ar plateau ages from a crosscutting glass vein in the howardite Kapoeta AMNH4788 range from 3.1 to 4.2 Ga. The glasses are unreliable for use in dating discrete impact events.

9:15 a.m. Goodrich C. A. * Fioretti A. M. O'Brien D. P. Zolensky M. Jenniskens P. Shaddad M. H.
Comparing the Foreign Clast Populations of Almahata Sitta and Typical Polymict Ureilites, with Implications **[#5018]**
E chondrites are the most abundant non-ureilite component of Almahata Sitta, based on currently studied samples. We search for E-meteorite material in typical polymict ureilites for comparison.

9:30 a.m. Downes H. * Rai N. Smith C. L. Herrin J. S. Ross A. J.
Fe-Silicide Phases in Polymict Ureilites: Siderophile Trace Element Fractionation **[#5064]**
We analysed siderophile elements in suessite in polymict ureilites by LA-ICPMS. It is depleted in incompatible siderophiles and patterns resemble those of Si-bearing metals in monomict ureilites. Suessite formed from pre-existing ureilitic metal.

9:45 a.m. Turrin B. D. * Lindsa F. N. Delaney J. S. Park J. Herzog G. F. Swisher C. C.
A 4548 Ma $^{40}Ar/^{39}Ar$ Age of a Feldspathic Clast in Almahata Sitta: Implication for the Ureilite Parent Body Age and the Assembly Age of Asteroid 2008 TC3 **[#5328]**
We present $^{40}Ar/^{39}Ar$ ages on albite and high-K glass inclusions found in pyroxenes from the Almahata Sitta (AhS) clast MS-MU-011. Our ages constrain the time of differentiation on the Ureilite Parent body and constrain the assembly age of AhS.

10:00 a.m. Rai N. * Downes H. Smith C. L.
Modelling of Oxygen Isotopes and Major Element Chemistry of Ureilites **[#5105]**
We used a combination of all chondritic meteorite types (CH, CI, CK, CM, CO, CR, CB, EH, EL, H, L, LL, R), Fe-rich and Fe-poor chondrules, using oxygen isotope signatures and a range of elemental ratios to model the building blocks of the ureilite parent body.

10:15 a.m. Hahn T. M. Jr. * Lunning N. G. McSween H. Y. Jr. Taylor L. A.
Granitoid Clast in Howardite: Diversity Among Evolved Vestan Lithology **[#5085]**
We describe a granitoid clast in a howardite that may represent an evolved lithology that occurs locally on Vesta. We examine the two competing hypotheses for producing evolved melts on Vesta.

10:30 a.m. Lunning N. G. * Hahn T. M. Beck A. W. McSween H. Y. Jr.
Plagioclase Depletion by Comminution in the Vestan Regolith **[#5067]**
Quantitative modal analysis of regolithic howardites reveals that, compared to proportions found in unbrecciated eucrites, plagioclase is depleted relative to cumulate and basaltic eucrite composition pyroxene in these howardites.

10:45 a.m. Warren P. H. * Isa J. Baecker B. Kohl I. E. Young E. D.
Northwest Africa 8659: A Stannern-Trend Eucrite Rich in Late/Secondary Olivine **[#5374]**
NWA 8659 is unusual in several respects. Its bulk composition is more Stannern-Trend (1.2 wt% TiO2) than Stannern itself. It is exceptionally rich in various textural types of late/secondary olivine. Its thermal metamorphism is type "2" (very mild).

11:00 a.m. McFadden L. A. * McCord T. B. Scully J. E. C. Dawn Science Team A. N. D.
Vesta Before Arrival at Ceres: Regional Surface Composition **[#5143]**
After Dawn left Vesta for Ceres, the science team analyzed all data from Vesta publishing a systematic study of the surface mineralogy of Vesta using spectroscopy, imaging, topography, geology, elemental and gravity data. Results are presented.

11:15 a.m. Ward D. * Bischoff A. Roszjar J. Whitehouse M. J.
REE Content of Meteoritic Ca-Phosphates **[#5056]**
The REE content of 300 Ca-phosphates (apatites and merrillites) from nine meteorite classes was analyzed by LA-ICP-MS and SIMS. They account for the majority of the REE budget with enrichments of up to two orders of magnitude compared to the bulk rocks.

Thursday, July 30, 2015
CARBONACEOUS CHONDRITES: HYDROUS AND ANHYDROUS
1:30 p.m. Stanley Hall Room 105

Chairs: **Martin Lee**
Jutta Zipfel

1:30 p.m. Young E. D. * Ly A. Kohl I.
The Chemical Consequences of Chondrite Parent Body Hydrothermal Activity **[#5273]**
Numerical models and analog studies point to the possibility for isochemical alteration during hydrothermal alteration of carbonaceous chondrites. Isochemical alteration is not evidence against fluid flow.

1:45 p.m. Vaccaro E. * Wozniakiewicz P. J. Starkey N. A. Franchi I. A. Russell S. S.
Grain Size Distribution in the Matrix of Primitive Meteorites **[#5258]**
We describe the abundances and size distribution of discrete grains of different phases observed within the matrix of: Acfer 094, ALHA77307, MIL 07687 and QUE 99177 and discuss how the observed differences may be evidence of parent body processes.

2:00 p.m. Tsuchiyama A. * Takahashi R. Miyake A. Kaswamura K.
Hydrous Alteration Experiments of Mg Amorphous Silicate Nanoparticles **[#5165]**
Disordered mixed layer hydrous silicates easily formed by hydrous alteration experiments using nanoparticles of Mg amorphous silicates. Implications for hydrous carbonaceous chondrites are discussed.

2:15 p.m. Treiman A. H. * Gross J.
The CR2 Chondrite NWA 801: Petrography and Petrology **[#5077]**
NWA 801 is fairly typical of CR2 chondrites.

2:30 p.m. Jones R. H. * Brearley A. J. Henkel T. Lyon I.
Assessing the Degree of Secondary Alteration in Chondrules from One of the Least Altered CR Chondrites, EET 92042 **[#5190]**
Most chondrules in EET 92042 are close to pristine. Observed alteration effects at the edges of chondrules, including smooth phyllosilicate rims, are heterogeneous because they are dependent on local mineralogy.

2:45 p.m. Orthous-Daunay F.-R. * Flandinet L. Thissen R. Vuitton V. Bonal L.
Effects of Aqueous Alteration on the Free Organic Matter in Several CR Chondrites by ESI-Orbitrap-MS **[#5306]**
We extracted and analyzed different soluble organic fractions from variously altered CR chondrites using high resolution Orbitrap-MS. The molecular diversity decreases as the aqueous alteration degree increase in our sample set.

3:00 p.m. Singerling S. A. * Brearley A. J.
The Effects of Aqueous Alteration on Primary Iron Sulfides in CR and CM Chondrites **[#5271]**
This study describes the textures and compositions of two groups of primary sulfides which have experienced aqueous alteration. This provides further evidence for the presence of primary sulfides in CR and CM chondrites.

3:15 p.m. Dominguez G. * Gainsforth Z. McCleod A. Kelly P. Bechtel H. Keilmann F. Thiemens M. Westphal A. Basov D. N.
Tracing Aqueous Alteration in Murchison Using NanoFTIR, SEM, TEM, and STXM **[#5362]**
Aqueous alteration of primitive meteorites may be an important source of prebiotic molecules. Here, using nanoFTIR and STXM, we present in-situ evidence of prebiotic molecule as inferred by P=O bond mapping and associated mineralogy in this region.

3:30 p.m. Lee M. R. * Lindgren P.
Serpentinisation of Chondrules in the Murchison CM Carbonaceous Chondrite by Centripetal Replacement and Cementation **[#5220]**
We have found that phenocrysts in Murchison chondrules contain serpentine. Olivine-hosted veins have formed by replacement whereas polyhedral serpentine has formed by cementation of pores within clinoenstatite grains.

3:45 p.m. Brearley A. J. * Le Guillou C.
More Evidence of the Importance of Amorphous Silicates in CM Carbonaceous Chondrites: New Observations from a Fine-Grained Rim in the CM2 Chondrite, TIL 91722 **[#5192]**
A fine-grained rim in TIL 91722 contains abundant amorphous silicate material containing nanophase sulfides. Phyllosilicates are rare. The amorphous material has a high ferric iron content indicative of oxidation coupled with hydration.

4:00 p.m. King A. J. * Schofield P. F. Russell S. S.
Thermal Alteration of CI and CM Chondrites: Mineralogical Changes and Metamorphic Temperatures **[#5212]**
Modal mineralogy, H_2O abundances and spectral features are used to constrain the origin of thermally altered CI and CM chondrites. Heterogeneous heating was probably caused by impact shocks and affected the surfaces of many C-type asteroids.

4:15 p.m. Quirico E. * Bonal L. Flandinet L. Beck P. Alexander C. M. O' D. Yabuta H. Nakamura T. Nakato A. Schmitt-Kopplin P.
Rating Thermal Metamorphism in C2 Chondrites with Insoluble Organic Matter **[#5090]**
We report a Raman and FTIR survey of IOM in 51 types 1 and 2 chondrites, and discuss the implications on nature and extent of thermal metamorphism.

4:30 p.m. Tomeoka K. * Ohnishi I.
Redistribution of Chondrules and Matrix Grains in the Mokoia Chondrite Parent Body: A Model **[#5148]**
Based on our recent studies of the Mokoia CV3 chondrite, we propose a model that the lithology of this meteorite formed through redistribution of chondrules and matrix grains in the meteorite parent body.

4:45 p.m. Sakai M. * Tomeoka K. Seto Y. Miyake A.
Pseudomorphs of Chondrules and CAIs in Dark Clasts in the Allende CV3 Chondrite **[#5233]**
We will present the results of SEM (back-scattered electron) and TEM observations of chondrule pseudomorphs in two DCs in Allende CV3 chondrite.

5:00 p.m. Zipfel J. * Palme H. DiRocco T. Pack A.
Inclusion AF in Allende Revisited — Relationship to Dark Inclusions? **[#5217]**
Presenting new data for oxygen isotopes of Allende AF inclusion and relationship to dark inclusions in CV3 chondrites.

Thursday, July 30, 2015
MARS EXPLORATION AND MARTIAN METEORITES:
PETROLOGY, GEOCHEMISTRY, AND WATER-ROCK INTERACTION
1:30 p.m. Sibley Auditorium

Chairs: **Gretchen Benedix**
Laurent Remusat

1:30 p.m. Nyquist L. E. * Park J. Nagao K. Haba M. K. Mikouchi T. Kusakabe M. Shih C.-Y. Herzog G. F.
"Normal Planetary" Ne-Q in Chelyabinsk and Mars **[#5054]**
Chelyabinsk contains "Q"-noble gases. Martian shergottite Dhofar 378 contains trapped $^{20}Ne/^{22}Ne$ = 7.3 ± 0.3, derivable from Q-Ne with $^{20}Ne/^{22}Ne$ = 10.67 via fractionation by solar wind induced sputtering. Martian juvenile Ne is suggested to be Q-Ne.

1:45 p.m. Lin Y. * El Goresy A. Zhang J. Miyahara M. Hao H. Zhang M. Ohtani E. Gillet Ph.
H and C Isotopes of C-Grains from Martian Meteorite NWA 6162 **[#5039]**
C-grains were found in shocked melt pockets from martian meteorite NWA 6162, with δD from –10 to +650‰ and $\delta^{13}C$ from –24 to +6‰. The D-enriched grains are normal in C isotopes, except for one ^{13}C-depleted, suggestive of various reservoirs.

2:00 p.m. Michalski J. R. * Smith C. L.
Clay Minerals on Mars: Updated Crystal-Chemistry from Infrared Remote Sensing and Comparison to Meteorite Data **[#5097]**
Updated crystal-chemical constraints from global remote sensing of Noachian clay. Martian clays shows that these clays have high FeO/MgO ratios compared to bulk martian meteorite compositions and compared to clay minerals within martian meteorites.

2:15 p.m. Tucker K. Hervig R. Till C. Wadhwa M. *
D/H in Nominally Anhydrous Phases in Martian Meteorites: Implications for the Martian Mantle **[#5173]**
We present the results of analyses of H_2O contents and hydrogen isotope compositions of nominally anhydrous phases in five (enriched and depleted) shergottites and three nakhlites, based upon which we make inferences about mantle composition on Mars.

2:30 p.m. Maltsev O. V. * Ziegler K. Sharp Z. D. Agee C. B.
Water in Martian Meteorites: Oxygen Isotope Compositions **[#5299]**
We present the results of oxygen isotope analysis of water extracted from shergottites Tissint and Zagami using stepwise heating between temperatures of 20° and 1000°C.

2:45 p.m. Irving A. J. * Kuehner S. M. Ziegler K. Andreasen R. Righter M. Lapen T. J. Pitt D.
Chlorophaeite-Bearing Nakhlite Northwest Africa 10153: Petrology, Oxygen, and Hafnium Isotopic Composition, and Implications for Magmatic or Crustal Water on Mars **[#5251]**
The ninth known nakhlite contains interstitial chlorophaeite-like material that may signify addition of martian crustal water.

3:00 p.m. Breton H. * Lee M. R.
Martian Fluid Evolution Recorded in Smectite from the NorthWest Africa (NWA) 817 Nakhlite Meteorite **[#5107]**
We investigate the texture, mineralogy and chemical composition of alteration products of the NWA 817 nakhlite to better understand the martian fluid composition and evolution.

3:15 p.m. Remusat L. * Zanda B. Beck P. Lorand J.-P. Pont S. Leroux H. Hewins R.
New Constraints on the Water Budget in the Martian Breccia Meteorite NWA 7533 **[#5125]**
We measured by NanoSIMS the water content and D/H of ilmenite and apatite clasts in NWA 7533. They have recorded a late hydrous alteration event on Mars. Besides, oxyhydroxyde grains around pyrites are products of terrestrial weathering.

3:30 p.m. Liu Y. * Ma C. Chen Y. Beckett J. Guan Y.
Rare-Earth minerals in Martian Meteorite NWA 7034/7533: Evidence for Fluid-Rock Interaction in Martian Crust **[#5051]**
Previously, we reported finding of monazite, chevikinite-perrierite and xenotime in the 'Black Beauty' meteorite (NWA 7034/7533). Here, we show textural and compositional evidence of these minerals that suggest hydrothermal fluids in martian crust.

3:45 p.m. Bridges J. C. * MacArthur J. L. Hicks L. J. Burgess R. Joy K.
Alteration of a Martian Impact Regolith Recorded in NWA 8114 **[#5284]**
A TEM, XANES, Ar-Ar study of martian breccia NWA 8114 shows it underwent high T oxidation and breakdown of px to Fe oxide, amorphous silicate and recrystallised px. This together with veining and accretionary rim formation reset the Ar-Ar.

4:00 p.m. Waeselmann N. Humayun M. * Yang S. Hewins R. H. Zanda B. Leroux H.
Siderophile Elements in Pristine and Altered Clasts in NWA 7533 **[#5358]**
Elemental relations of Ni, Ge, etc., discriminate five pristine igneous-textured clasts from coarse-grained impact melt rocks in NWA 7533. An altered pyroxene clast was weathered or hydrothermally altered on Mars.

4:15 p.m. Santos A. R. * Agee C. B. McCubbin F. M. Shearer C. K.
Evidence for Exotic Fe-, Ti-, and P-Enriched Magmas on Mars from Meteorite Northwest Africa 7034 **[#5279]**
A group of lithic clasts within martian meteorite NWA 7034 are enriched in Fe, Ti, and P, and are similar to a group of terrestrial rocks enriched in these elements. We investigate the petrogenesis of this martian rock type.

4:30 p.m. Dunham E. * Wadhwa M. Tucker K. Balta J. B. McSween H. Y.
Rare Earth Element Geochemistry of the Shergottites LAR 12095, 12240, and 12011 **[#5289]**
REE geochemistry confirms pairing of shergottites LAR 12095 and LAR 12240, and of LAR 12011 with LAR 06319. Calculations of magmatic fO2 suggest that these shergottites originated from martian mantle sources with different redox conditions.

4:45 p.m. Benedix G. K. * Hamilton V. E. Reddy S. M.
Assessing Mineral Orientation in Martian Meteorites Using IR Microspectroscopy and EBSD Techniques **[#5202]**
Spectral features of minerals are dependent on composition and orientation. Using electron backscatter diffraction and microspectroscopy techniques, we can unravel these effects from each other.

5:00 p.m. Sharp T. G. * Walton E. L. Hu J.
Shock Effects in NWA 8159: A Martian Plagioclase-Augite Basalt **[#5346]**
The purpose of this study is to determine the high-pressure phases in and associated with the shock veins. High-pressure minerals in the shock veins indicate a shock pressure of approximately 16 GPa and a relatively long shock duration.

Friday, July 31, 2015
MICROSAMPLE ANALYSIS: IDPS, MICROMETEORITES, AND STARDUST
8:30 a.m. Stanley Hall Room 105

Chairs: **Keiko Nakamura-Messenger**
Natalie Starkey

8:30 a.m. Brownlee D. E. * Joswiak D. J.
Asteroids and Comets — Did the Diversify of Nebular Solids Decline with Distance from the Sun? **[#5285]**
The Mn contents of ferrous olivine grains in a cluster IDP of probable cometary origin match what is seen in comet Wild 2 olivines. This finding is consistent with suggestions that most comets contain similar averaged samplings of nebular solids.

8:45 a.m. Messenger S. * Brownlee D. E. Joswiak D. J. Nguyen A. N.
Nebular and Interstellar Materials in a Giant Cluster IDP of Probable Cometary Origin **[#5365]**
We are conducting coordinated mineralogical, and isotopic studies of a giant cluster CP-IDP to determine proportions of inner solar system and interstellar materials. We have identified an ^{16}O-rich enstatite grain that likely formed near the Sun.

9:00 a.m. Pepin R. O. * Palma R. L. Schlutter D. J. Brownlee D. E. Joswiak D.
Noble Gases in Giant Cluster IDP U2-20GCA **[#5149]**
Noble gas analyses of 15 particles from U2-20GCA reveal a suite of trapped ^{20}Ne/^{22}Ne ratios similar to HL-Ne, Q-Ne and SW-Ne. Highly spallogenic ^{21}Ne/^{22}Ne points to past residence in an environment of intense energetic proton radiation.

9:15 a.m. Starkey N. A. * Franchi I. A. Salge T. Brearley A. J.
Relationship Between Carbon and Silicates in Cometary Dust **[#5103]**
An ultracarbonaceous IDP fragment is analysed with combined high spatial resolution SEM-EDX and H, C, O isotope mapping to investigate the relationship between the organic matter matrix and the small silicate grains contained within.

9:30 a.m. Bardin N. * Duprat J. Engrand C. Slodzian G. Baklouti D. Dartois E. Brunetto R. Delauche L. Godard M. Wu T. D. Guerquin-Kern J. L.
D/H and ^{15}N/^{14}N Isotopic Ratios in Organic Matter of Ultracarbonaceous Antarctic Micrometeorites **[#5275]**
We measured H and N isotopic images using polyatomic species with a NanoSIMS-50, together with elemental ratios (C/H and C/N), on an ultracarbonaceous Antarctic micrometeorite. These analyses suggest that its organic matter contain different phases.

9:45 a.m. Hu Z. W. * Winarski R.
Making Hidden Pristine Submicron Carbonaceous Hollow Grains Stand Out In Situ in Interplanetary Dust **[#5267]**
We demonstrate that phase contrast X-ray nanotomography enables hidden pristine sub-µm carbonaceous hollow globules not only to be effectively located in situ in intact IDPs but also to be morphologically and structurally visualized in 3-D detail.

10:00 a.m. Yabuta H. * Noguchi T. Itoh S. Nakamura T. Mitsunari T. Okubo A. Okazaki R. Tachibana T. Terada K. Ebihara M. Nagahara H.
Variations in Organic Functional Groups Between Hydrous and Anhydrous Antarctic Micrometeorites **[#5301]**
Carbon-XANES spectra of organics between hydrous and anhydrous Antarctic micrometeorites (MMs) were compared. In most cases, carbonyl group in anhydrous MMs are more abundant than that in hydrous MM. Organics in hydrous MM is chondritic IOM-like.

10:15 a.m. Defouilloy C. * Joswiak D. J. Brownlee D. E. Nakashima D. Tenner T. J. Kita N. T.
Oxygen Three Isotope Ratios in Five Comet Particles from Stardust Tracks 149 and 172 **[#5131]**
We report oxygen isotopic composition of five new Stardust particles. Particles from track 149 show a general correlation between O isotopes and Mg#, similar to that observed in CR chondrites. Particle 172B appears to be a unique ^{16}O-rich enstatite.

10:30 a.m. Snead C. J. * McKeegan K. D.
New Oxygen Isotope Measurements of Four Stardust Impact Crater Residues Show IDP-Like Compositions **[#5253]**
We have measured the oxygen isotope compositions of four Stardust impact crater residues. These analyses reveal compositions that are similar to those found in interplanetary dust particles, antarctic micrometeorites and CI chondrite components.

10:45 a.m. Ishii H. A. * Bradley J. P.
Transmission Electron Microscopy Advances Reveal Subtle Comet Dust Differences **[#5162]**
TEM advances in multi-SDD-detector EDX mapping applied to Wild 2 dust and likely-cometary CP IDPs demonstrates chondritic fine-grained material at terminal particles is unlike GEMS and consistent with debris generated during the deceleration process.

11:00 a.m. Haas B. A. * Croat T. K. Floss C. Kearsley A. T. Burchell M. J.
Characterizing Comet 81P/Wild 2 with Acfer 094 Analog Foils **[#5141]**
NASA's Stardust mission returned cometary material from comet Wild 2 in Al foil collectors. Creating analog foils with material from meteorite Acfer 094 allows us to investigate the violent collection process to determine the comet's composition.

11:15 a.m. Nakamura-Messenger K. * Messenger S. Westphal A. J. Palma R. L. Pepin R. O.
Mineralogy of Interplanetary Dust Particles from the Comet Giacobimi-Zinner Dust Stream Collections **[#5322]**
We report a mineralogy study of dust particles from comet 21P/Giacobini-Zinner dust stream targeted collection, showing remarkable mineralogical diversity of each cluster.

11:30 a.m. Joswiak D. J. * Brownlee D. E. Ishii H. A. Sutton S. R.
Electron Energy Loss Spectroscopy Measurements of Titanium Valence States in Refractory Nodule Pyroxenes from a Likely Cometary IDP **[#5144]**
Mineralogical properties combined with Ti EELs measurements on fassaites from refractory nodules in an IDP of likely cometary origin are consistent with formation in a restricted nebular environment with variable f_{O2}.

11:45 a.m. Floss C. * Wiesman H. Haenecour P.
NanoSIMS and Auger Analysis of Impact Craters from the Genesis 'Aluminum Kidney' **[#5010]**
Results of NanoSIMS and Auger analyses of two craters from the Genesis polished aluminum collector are reported. Apart from one O-anomalous grain, we found no clear evidence of residue from the impactor particles.

Friday, July 31, 2015
CHONDRITES: PARENT BODIES, COMPONENTS, ALTERATIONS, AND IMPACT PROCESSES
8:30 a.m. Sibley Auditorium

Chairs: **Catherine Corrigan**
Mitsuru Ebihara

8:30 a.m. Kuehner S. M. * Irving A. J. Ziegler K. Sanborn M. E. Yin Q.
F3/4 Chondrite Northwest Africa 7135: Further Assessment of Its Relationship to Clasts in the Cumberland Falls Aubrite **[#5238]**
There are now two discrete meteorite specimens belonging to the rare F chondrite class first recognized as clasts in Cumberland Falls.

8:45 a.m. Mittlefehldt D. W. * Peng Z. X. Torrano Z. A.
Petrology and In Situ Trace Element Chemistry of a Suite of R Chondrites **[#5338]**
Your eyes are not deceiving you: Duck has submitted an abstract to a chondrite session. We will present the results of our petrological and compositional studies of R chondrites of diverse petrological type.

9:00 a.m. Ebihara M. * Shirai N. Takahashi H.
Chemical Characteristic of CK Chondrites in the Light of P, REEs, Th, and U **[#5269]**
A total of 16 Antarctic CK chondrites were analyzed by ICP-AES for P and by ICP-MS for rare earth elements, Th and U. Based on the data for these elements, the formation process and the structure of CK chondrite parent body are discussed.

9:15 a.m. Dobrica E. * Brearley A. J.
A New Lamellar Sulfide Morphology Associated with Glassy Silicate Materials in Unequilibrated Ordinary Chondrites **[#5132]**
We identified a new intergrowth composed of lamellar sulfide and FeO-rich silica glass in several unequilibrated ordinary chondrites. The goal is to investigate the formation of these materials and to determine the processes that form them.

9:30 a.m. Bigolski J. N. * Weisberg M. K.
A Comparative Study of Fine-Grained Materials in O and C Chondrites **[#5319]**
Fine-grained materials are surveyed among primitive meteorites. The diversity of fine-grained rims provide clues to unraveling the accretion of chondrules onto parent bodies and offer insights into the alteration histories of chondrite groups.

9:45 a.m. Shah J. * Muxworthy A. R. Russell S. S. Genge M. J.
Using Micro-CT to Map Meteoritic Magnetism **[#5100]**
We present a method that uses micro-CT scans to re-orientate ex-situ chondrules to their in-situ position, allowing a full-vector paleomagnetic study of the chondrules in Bjurböle (L/LL4). We find that the magnetization is statistically random.

10:00 a.m. Lewis J. A. * Jones R. H.
Microtextural Study of Feldspar in Petrologic Type 4 Ordinary Chondrites: Contrasting Records of Parent Body Metasomatism **[#5119]**
We have carried out a detailed microtextural study of feldspar in petrologic type 4 H, L, and LL OCs in order to understand differences in the composition and/or timing of fluid reactions among the OC parent bodies during metamorphism.

10:15 a.m. Corrigan C. M. * Lunning N. G. Friedrich J. M. McCoy T. J.
An H Chondrite Clast in an LL Chondrite: Impact Melt or Incipient Partial Melt? **[#5283]**
We examine the possible provenance of a melt clast found in LL chondrite MET 01004 .

10:30 a.m. Choi B.-G. * Kim H. Kim H. Lee J. I. Kim T. H. Ahn I. Yi K. Hong T. E.
Jinju H5 Chondrite: A New Fall in Korea Having Numerous Vugs Filled with Vapor-Phase Crystallized Minerals **[#5091]**
The Jinju H5 chondrite is highly porous and has numerous vugs with euhedral crystals. We suspect these crystals condensed from impact produced vapor and that probably the meteorites was neither equilibrated nor compacted when the impact occurred.

10:45 a.m. Fudge C. * Hu J. Sharp T. G.
Crystallization of Wadsleyite and Ringwoodite in Sahara 98222, 00293, and 00350: Constraints on Shock Conditions **[#5347]**
We report on the coexistence of wadsleyite and ringwoodite in transformed clasts within three ordinary chondrites: Sahara 98222, 00293 and 00350. High-pressure mineralogy is used to constrain conditions of the impact event on the parent body.

11:00 a.m. Ruzicka A. M. * Clay P. L. Hugo R. Joy K. H. Busemann H.
Contrasting Early and Late Shock Effects on the L Chondrite Parent Body: Evidence from Ar Ages and Olivine Microstructures for Two Meteorites **[#5177]**
We discuss Ar age and olivine microstructure data for two L6 chondrites that provide a case study of contrasting shock effects in similar chondritic materials deformed in different epochs and under different conditions.

11:15 a.m. Korochantseva E. V. * Buikin A. I. Hopp J. Lorenz C. A. Trieloff M.
The Chelyabinsk Meteorite: Variable Shock Effects Recorded by the ^{40}Ar-^{39}Ar System **[#5268]**
Shocked lithologies of the Chelyabinsk LL chondrite have higher apparent ^{40}Ar-^{39}Ar ages than the very young light lithology. We interpret previous impact events made shocked lithologies more retentive and resistant against thermal reset.

11:30 a.m. Muxworthy A. R. * Bland P. A. Collins G. Moore J.
Magnetic Fabrics in Allende: Implications for Magnetic Remanence Acquisition **[#5045]**
Mineral magnetic analysis of Allende meteorite matrix reveals a strong magnetic fabric. This is argued to have formed during impact-induced, heterogenic compaction.

11:45 a.m. Forman L. V. * Bland P. A. Timms N. E. Daly L. Collins G. S. Davison T. M. Trimby P. W. Ringer S. P.
Recovering the Primordial Impact History of Chondrites in Unprecedented Detail Using Massive EBSD Datasets **[#5086]**
EBSD analyses are used to identify relationships between a chondrule and surrounding matrix in Allende. Observations act as potential 'way-up' indicators for compaction-related impacts on the surface of the parent body.

Friday, July 31, 2015
IRON AND STONY-IRON METEORITES: COMPOSITION, ISOTOPES, SHOCK, AGES
A TRIBUTE DEDICATED TO JOE GOLDSTEIN
1:30 p.m. Stanley Hall Room 105

Chairs: **Carl Agee**
Jeremy Delaney

1:30 p.m. Mayne R. G. * McCoy T. J.
Pallasites: Does Density Matter After All? **[#5222]**
We utilize CT-data to understand the 3D relationship between metal and olivine in pallasites, in an attempt to constrain and test existing pallasite formation models.

1:45 p.m. Agee C. B. * Ziegler K. Muttik N.
New Unique Pyroxene Pallasite: Northwest Africa 10019 **[#5084]**
Discovery of NWA 10019 brings the number of different pyroxene pallasite types to five. These combined with the PMG, PES, and Milton would require a minimum of eight distinct parent bodies for the pallasite meteorites.

2:00 p.m. Chabot N. L. * Beck A. W. Ash R. D.
Examining Trace Element Partitioning into Iron Phosphide, with Applications to Iron Meteorites **[#5023]**
We present the first results from our experimental study to determine trace element partitioning behavior into iron phosphide, with applications to understanding the formation and evolution of iron meteorites.

2:15 p.m. Breen J. P. * Rubin A. E. Wasson J. T.
Shock Effects in IIIE Iron Meteorites: Implications for Parent-Body History **[#5083]**
IIIE irons comprise weakly shocked to severely shocked samples; the latter set contains vesicular troilite filaments. Haxonite occurs in weakly-to-moderately shocked IIIE irons, but is fully decomposed to graphite in strongly shocked samples.

2:30 p.m. Scott E. R. D. * Huss G. R. Goldstein J. I.
Carbon in Plessite and Taenite in Iron and Stony-Iron Meteorites **[#5124]**
Ion microprobe analyses for C in fine-grained plessite in carbide-bearing irons range from 10 ppm by wt. in pearlitic plessite to 1000 ppm in martensitic plessite. C contents give valuable clues to taenite decomposition temperatures and mechanisms.

2:45 p.m. Ek M. * Hunt A. C. Schönbächler M.
The Effects of Galatic Cosmic Ray Irradiation on Palladium Isotopes in Iron Meteorites **[#5181]**
New Pd isotope data of IAB, IIAB, IVA and IVB iron meteorites are presented. Preliminary results suggest correlated variations in 104Pd and the more established Pt dosimeter as well as the absence of nucleosynthetic anomalies in IAB meteorites.

3:00 p.m. Cook D. L. * Burkhard R. Schönbächler M. Leya I.
Iron Isotopes in the Metal Phase of IAB Iron Meteorites **[#5326]**
We analyzed IAB irons with a range of CRE ages to investigate whether effects from GCR may influence Fe isotopes. No resolvable anomalies were observed. Modeling of potential cosmic ray effects on Fe are underway to compare to our observations.

3:15 p.m. Isa J. * McKeegan K. D. Wasson J. T.
Cr-Bearing Inclusions in IVA Irons: Implication for Cr and Volatile Behaviors in the Metallic Cores **[#5352]**
We found inclusions that contribute to bulk Cr concentrations and found f_{O2} or f_{S2} changes during crystallization. O-isotope compositions of chromite are mass-dependently lighter than other IVA oxides. Also, we discovered a new mineral $MnCr_2S_4$.

3:30 p.m. Delaney J. S. * Turrin2 B. Lindsay F. Herzog G. F. Park J. Swisherr C. III
^{40}Ar-^{39}Ar Age Differences Across Petrographic Boundaries In Mesosiderites **[#5164]**
Petrographically constrained laser ^{40}Ar-^{39}Ar dates in mesosiderites reveal sub-cm scale age heterogeneity. Profiling across lithological boundaries shows bimodal ages that are probably associated with metal-silicate mixing and metamorphism.

3:45 p.m. Haba M. K. * Yamaguchi A. Hidaka H.
Formation Mechanism of Zircons in Mesosiderites **[#5207]**
Zircons in mesosiderites can be divided into two types based on geochemical features; one could be a relict zircon derived from silicate parts before the metal-silicate mixing and the other is a secondary zircon that formed during the mixing event.

Friday, July 31, 2015
ORGANIC MATTER IN METEORITES:
SOURCES, DISTRIBUTIONS, AND EVOLUTION
1:30 p.m. Sibley Auditorium

Chairs: **Joseph Nuth III**
Bradley De Gregorio

1:30 p.m. Tachibana S. * Piani L. Dessimoulie L. Hama T. Kimura Y. Endo Y. Fujita K. Nakatsubo S. Fukushi H. Mori S. Chigai T. Yurimoto H. Kouchi A.
Photochemistry in Molecular Clouds: Structure and Physical Properties of Organic Residues and Ice and Sublimation of Volatile Molecules **[#5248]**
We present the structure and physical properties of organic residues formed in low temperature photochemical experiments to simulate the formation and evolution of organic matter in molecular clouds. Sublimated volatile species are also discussed.

1:45 p.m. Nuth J. A. III * Johnson N. M. Ferguson F. T.
Fischer-Tropsch Reactions: Not the Simple Chemistry We Were All Led to Believe **[#5038]**
We report the production rate and solid/gas-phase product distribution of FTT reactions on iron, magnetite and iron-silicate smoke catalysts as a function of time, temperature and previous exposure history. The results are more complex than expected.

2:00 p.m. Johnson N. M. * Locke D. R. Yazzie C. A. Ferguson F. T. Nuth J. A. III
Organic Coatings Deposited by Fischer-Tropsch-Type Reactions **[#5370]**
Organic coating discussion includes results from pyrolysis GCMS, surface area and carbon deposition and how they differ according to temperature, time, and starting material.

2:15 p.m. Flynn G. J. *
Comparison of Organic Matter in Comets Churyumov-Gerasimenko and Wild 2 and in IDPs **[#5075]**
IR measurements of the surface of Churyumov-Gerasimenko show an organic feature from 3.1–3.3 µm, but neither Wild 2 particles, from jets sampling the interior, nor CP IDPs show this, suggesting comet surfaces may not represent the bulk organic.

2:30 p.m. Clemett S. J. * Messenger S. Nakamura-Messenger K. Thomas-Keprta K. L.
Coordinated Chemical and Isotopic Imaging of the Bells (CM2) Meteorite **[#5339]**
The organic composition of Bells matrix shows distinct compositional variations associated with the presence of organic nanoglobules. The presence of NH3 and simple carbonyls spatially appear spatially correlated with the nanoglobules.

2:45 p.m. Vinogradoff V. * Remusat L. Bernard S. Le Guillou C.
The Insoluble Organic Matter of the Paris CM Chondrite **[#5032]**
We study the IOM of the Paris carbonaceous chondrite, considered as one of the least altered chondrites, and compared it to Murchison IOM. Paris CM is likely the best CM sample available to infer the nature of the OM accreted on the CM parent body.

3:00 p.m. Bose M. * Root R. Pizzarello S.
Sulfur Compounds Detected by XANES in Murchison and Allende **[#5260]**
Sulfur speciation in insoluble organic matter extracted from Murchison and Allende was studied using XANES. The organic matter contains elemental sulfur, alkyl disulfides, thiols, sulfur heterocycles dibenzothiophene, thianthrene and sulfones.

3:15 p.m. Henkel T. * Lyon I. C.
First In-Situ Analysis of Amino Acids in the Murchison Meteorite with C60-TOFSIMS **[#5256]**
We found amino acids with a similar abundance pattern as previously reported by others. These amino acids show a spatial correlation with Mg indicating a possible involvement of Mg (or the corresponding mineral) in the processing of organic matter.

3:30 p.m. De Gregorio B. T. * Stroud R. M. Burgess K. D. Davidson J. Nittler L. R. Alexander C. M. O'D.
Chemical Heterogeneity of Organic Matter in Minimally-Heated CO Chondrites **[#5128]**
IOM from CO chondrites of low petrologic grade contain unusual S-rich organics with a compact texture. Aberration-corrected TEM-EELS indicates S in aromatic heterocycles. Nanoglobules in these residues contain more aromatic carbon than bulk IOM.

3:45 p.m. Kebukawa Y. * Zolensky M. E. Chan Q. H. S. Fries M. Steele A. Kilcoyne A. L. D. Rahman Z. Cody G. D.
Constraining Thermal Processing of Carbon-Rich Aggregates in Xenolithic Clasts from Sharps (H3.4) Meteorite **[#5158]**
We analyzed the carbon-rich aggregates using FTIR, Raman, C-XANES and TEM, in order to constrain their thermal process and possible origins. The estimated temperatures using several methods vary from 300° up to 800°C.

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Bechtel H.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Beck A. W.	Achondrites Posters, Tue, p.m., HMMB Floor One
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Bridges J. C.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Bridges J. C. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Britt D. T.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Brownlee D. E. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Bruck Syal M. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Brunetto R.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Brusnitsyna E. V.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Bryson K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Bryson K. L.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Buchner E. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Budde G.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Buhn B.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Buikin A. I.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Buikin A. I.	Chondrites, Fri, a.m., Sibley Auditorium
Bullock E. S.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Bullock E. S.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Burchell M. J.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Burchell M. J.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Burgess K. D.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Burgess R.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Burkhard R.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Burmistrov A.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Burnett D. S.	CAIs, Tue, a.m., Stanley Hall Room 105
Burnett D. S.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Busemann H.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Busemann H.	Lunar Samples, Tue, a.m., Sibley Auditorium
Busemann H.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Busemann H.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Busemann H. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Busemann H.	Chondrites, Fri, a.m., Sibley Auditorium
Cabrol N. A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Caffee M. W.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Cai Y.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Calaways M.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Capaccioni F.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Caplan C. E. *	Advanced Techniques, Mon, a.m., Sibley Auditorium
Caporali S.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Capria M. T.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Carlson R. W.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Carneiro J.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Carvalho W. P.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Caseres J. R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Cervantes-de la Cruz K. E.	Chondrule Posters, Tue, p.m., HMMB Floor One
Chabot N. L. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Chan Q. H.-S.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Chan Q. H. S.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Chan Q. H. S.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Chang Y. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Chatzitheodoridis E.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Chen H. W.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Chen H. Y.	Achondrites Posters, Tue, p.m., HMMB Floor One
Chen L.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Chen Y.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Chen Y.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Chennaoui Aoudjehane H.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Chennaoui Aoudjehane H.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Chigai T.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Choi B.-G. *	Chondrites, Fri, a.m., Sibley Auditorium
Christensen U.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Christoffersen R.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Christou A.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Ciarniello M.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Ciesla F. J.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105

Ciesla F. J. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Citon R. T. P.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Claeys Ph.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Clark B. C.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Clarke A.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Clarke A.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Clay P. L.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Clay P. L.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Clay P. L.	Chondrites, Fri, a.m., Sibley Auditorium
Claydon J. L.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Clayton A. N.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Clayton D. D.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Clemett S. J.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Clemett S. J. *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Cloquet C.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Coath C. D.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Cody G. D.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Cohen B. A. *	Advanced Techniques, Mon, a.m., Sibley Auditorium
Colas F.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Collins G.	Chondrites, Fri, a.m., Sibley Auditorium
Collins G. S.	Chondrites, Fri, a.m., Sibley Auditorium
Connelly J. N.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Conrad P.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Conrad P.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Consolmagno G. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Cook D. L. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Cooke W.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Corrigan C. M. *	Chondrites, Fri, a.m., Sibley Auditorium
Cournède C.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Crapster-Pregont E. J. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Crawford I. A.	Lunar Samples, Tue, a.m., Sibley Auditorium
Croat T. K.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Croat T. K.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Cronholm A.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Crow C. A. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Crowther S. A.	Lunar Samples, Tue, a.m., Sibley Auditorium
Crowther S. A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Crowther S. A. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Cuadros F. A.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Cunha S.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Cupak M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Cuzzi J. N. *	Award Presentations, Wed, a.m., International House (I-House) Chevron Auditorium
da Costa A. R.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Daly L. *	CAIs, Tue, a.m., Stanley Hall Room 105
Daly L.	Chondrites, Fri, a.m., Sibley Auditorium
Danielson L. R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Danielson L. R.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Dantas R.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Dartois E.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Dauphas N.	CAIs, Tue, a.m., Stanley Hall Room 105
David G.	Chondrule, Tue, p.m., Stanley Hall Room 105
Davidson J.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Davis A. M.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Davis A. M.	CAIs, Tue, a.m., Stanley Hall Room 105
Davison T. M.	Chondrites, Fri, a.m., Sibley Auditorium
Dawn Science Team A. N. D.	Achondrites, Thu, a.m., Sibley Auditorium
de Almeida T.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
de Araujo M. C.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Dearborn D. S. P.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
De Avillez R. R.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Debaille V.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Decker S.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Defouilloy C. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
De Gregorio B. T. *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Delaney J. S.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Delaney J. S.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Delaney J. S.	Achondrites, Thu, a.m., Sibley Auditorium
Delaney J. S. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Delauche L.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Demory F.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three

Dence M. R.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
de Oliveira D. E. M.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
De Sanctis M. C.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Desch S. J. *	Chondrule, Tue, p.m., Stanley Hall Room 105
de Séréville N.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Dessimoulie L.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Deutsch A.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Devouard B.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Devouard B.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Dijkstra A. H.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Dimitrev V.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
DiRocco T.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Dobrica E.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Dobrica E. *	Chondrites, Fri, a.m., Sibley Auditorium
do Carmo D.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Dominguez G. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
D'Orazio M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Dos Santos E. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Dos Santos E.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Downes H.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Downes H. *	Achondrites, Thu, a.m., Sibley Auditorium
Doyle P. M.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Dukes C. A.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Dunham E. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Dunin-Borkowski R. E.	Chondrule Posters, Tue, p.m., HMMB Floor One
Dunlap D. R. *	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Dunn T. L.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Duprat J.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Duprat J.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Durda D. D.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Durda D. D.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Dworkin J. P.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Ebel D. S.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Ebel D. S. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Ebel D. S.	Chondrule Posters, Tue, p.m., HMMB Floor One
Ebel D. S.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Ebel D. S.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Ebert S. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Ebert S.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Ebihara M.	Lunar Samples, Tue, a.m., Sibley Auditorium
Ebihara M.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Ebihara M.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Ebihara M. *	Chondrites, Fri, a.m., Sibley Auditorium
Echaurren J. C.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Eigenbrode J.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Eiler J. M.	Achondrites Posters, Tue, p.m., HMMB Floor One
Ek M. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
El Goresy A.	Chondrule, Tue, p.m., Stanley Hall Room 105
El Goresy A.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
El Kerni H.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Elkins-Tanton L.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Elliott T.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Endo Y.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Engrand C.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Enokido Y.	CAIs, Tue, a.m., Stanley Hall Room 105
Eppler D. B.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Erard S.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Essa K. S.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Evans C.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Ezzedine S. M. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Fagan T. J. *	CAIs, Tue, a.m., Stanley Hall Room 105
Fagan T. J.	Lunar Samples, Tue, a.m., Sibley Auditorium
Fagan T. J.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Farley K.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Fedkin A. V.	Chondrule, Tue, p.m., Stanley Hall Room 105
Feinberg J. M.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Ferguson F. T.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Ferreira L. V. R.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Ferrière L. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Fieber-Beyer S. K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One

Filacchione G.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Filiberto J.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Fioretti A. M.	Achondrites, Thu, a.m., Sibley Auditorium
Firsov N. N.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Flandinet L.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Floss C.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Floss C.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Floss C.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Floss C. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Flynn G. J.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Flynn G. J.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Flynn G. J. *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Forman L. V.	CAIs, Tue, a.m., Stanley Hall Room 105
Forman L. V. *	Chondrites, Fri, a.m., Sibley Auditorium
Franchi I. A.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Franchi I. A.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Franchi I. A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Franchi I. A.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Friedrich J. M. *	Advanced Techniques, Mon, a.m., Sibley Auditorium
Friedrich J. M.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Friedrich J. M.	Chondrule Posters, Tue, p.m., HMMB Floor One
Friedrich J. M.	Chondrites, Fri, a.m., Sibley Auditorium
Fries M.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Fries M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Fries M.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Fries M.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
FRIPON Team	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Fritz J.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Fritz T.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Fudge C. *	Chondrites, Fri, a.m., Sibley Auditorium
Fujimoto M.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Fujita K.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Fujiya W.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Fukushi H.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Gabitov R.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Gabriel T.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Gaffey M. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Gaidos E. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Gainey S. R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Gainsforth Z.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Galloway M. J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Galloway M. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Garnier J.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Garvie L. A. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Gattacceca G.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Gattacceca J.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Gattacceca J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Gattacceca J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Gattacceca J.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Gattacceca J.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Geisler T.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Genge M. J.	Chondrule Posters, Tue, p.m., HMMB Floor One
Genge M. J.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Genge M. J.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Genge M. J.	Chondrites, Fri, a.m., Sibley Auditorium
Ghosh S.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Giese C.-C.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Gillet Ph.	Chondrule, Tue, p.m., Stanley Hall Room 105
Gillet Ph.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Gilmour C. M.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Gilmour J. D.	Lunar Samples, Tue, a.m., Sibley Auditorium
Gilmour J. D. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Glass B. P.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Glass B. P.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Glavin D. P.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Glotch T. D.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Gnos E.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Godard M.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Goldstein J. I.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Goodrich C. A.	Achondrites Posters, Tue, p.m., HMMB Floor One

Goodrich C. A. *	Achondrites, Thu, a.m., Sibley Auditorium
Gottwald M.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Gounelle M.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Greenwood J. P.	Chondrule Posters, Tue, p.m., HMMB Floor One
Gregory D. A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Greshake A.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Greshake A.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Gritsevich M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Grokhovsky V.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Grokhovsky V. I.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Grokhovsky V. I.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Grokhovsky V. I.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Gross J.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Grossman L. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Guan Y.	CAIs, Tue, a.m., Stanley Hall Room 105
Guan Y.	Achondrites Posters, Tue, p.m., HMMB Floor One
Guan Y.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Guan Y.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Guerquin-Kern J. L.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Guerra A.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Guimarães E.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Gyngard F.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Haas B. A.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Haas B. A. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Haba M. K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Haba M. K.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Haba M. K. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Haenecour P. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Haenecour P.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Haenecour P.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Hahn T. M.	Achondrites Posters, Tue, p.m., HMMB Floor One
Hahn T. M.	Achondrites, Thu, a.m., Sibley Auditorium
Hahn T. M. Jr. *	Achondrites, Thu, a.m., Sibley Auditorium
Haloda J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Halodova P.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Hama T.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Hamann C. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Hamann C.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Hamilton V. E.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Hamilton V. E.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Hammer J. E.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Han J. *	CAIs, Tue, a.m., Stanley Hall Room 105
Han J. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Hanna R. D.	Chondrule Posters, Tue, p.m., HMMB Floor One
Hansen B. T.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Hanton L. T. J.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Hao H.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Harlan S.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Harries D.	Chondrule, Tue, p.m., Stanley Hall Room 105
Harries D. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Harris A.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Harris T. H. S.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Hartmann W. K. *	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Hartmann W. K.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Harvey J. P.	CAIs, Tue, a.m., Stanley Hall Room 105
Harvey R. P.	Achondrites Posters, Tue, p.m., HMMB Floor One
Hasebe N.	Lunar Samples, Tue, a.m., Sibley Auditorium
Hasebe N.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Hashiguchi M.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Hashimoto H.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Hauser N.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Hauser N.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Hauser N.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Hausrath E. M.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Hays L. E.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Head J. W.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Hecht L.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Hecht L.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Heck P. R.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Heck P. R.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium

Kuno H.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Kusakabe M.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Kusano H.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Kusiak M. A.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Kwon S.-T.	Lunar Samples, Tue, a.m., Sibley Auditorium
Landman N. H.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Langenhorst F.	Chondrule, Tue, p.m., Stanley Hall Room 105
Langenhorst F.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Lapen T. J.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Lapen T. J.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Laquerre A.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Larsen K.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Laubenstein M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Le Corre L.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Lee J. I.	Lunar Samples, Tue, a.m., Sibley Auditorium
Lee J. I.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Lee J. I.	Chondrites, Fri, a.m., Sibley Auditorium
Lee M. J.	Lunar Samples, Tue, a.m., Sibley Auditorium
Lee M. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Lee M. R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Lee M. R.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Lee M. R. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Lee M. R.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Lee T. *	CAIs, Tue, a.m., Stanley Hall Room 105
Lee T.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Le Guillou C.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Le Guillou C.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Leitner J. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Lemelle L.	Chondrule, Tue, p.m., Stanley Hall Room 105
Lenting C.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Leroux H.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Leveille R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Levy J. S.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Lewis J. A.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Lewis J. A. *	Chondrites, Fri, a.m., Sibley Auditorium
Lewis J. B.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Leya I.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Leya I.	Chondrule, Tue, p.m., Stanley Hall Room 105
Leya I.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Leya I.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Leya I.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Leyrat C.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Li J.-Y.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Li S. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Li S. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Li X. Y.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Li X. Y.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Li Y.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Li Y.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Liebig B.	CAIs, Tue, a.m., Stanley Hall Room 105
Liebig B.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Lin Y. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Lindgren P.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Lindgren P.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Lindsa F. N.	Achondrites, Thu, a.m., Sibley Auditorium
Lindsay F.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Lindsay F. N.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Lindsay F. N.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Lindsay F. N. *	Achondrites, Thu, a.m., Sibley Auditorium
Liu H. W.	CAIs, Tue, a.m., Stanley Hall Room 105
Liu M-C.	CAIs, Tue, a.m., Stanley Hall Room 105
Liu M.-C.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Liu N. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Liu Y.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Liu Y. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Lobo A.	Chondrule, Tue, p.m., Stanley Hall Room 105
Locke D. R.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Lockwood A. C.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Loesche C.	Chondrule Posters, Tue, p.m., HMMB Floor One
Logunova M. N.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One

Lopes J. A. M.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Lorand J.-P.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Lorenz C. A.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Lorenz C. A.	Achondrites Posters, Tue, p.m., HMMB Floor One
Lorenz C. A.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Lorenz C. A.	Chondrites, Fri, a.m., Sibley Auditorium
Lunning N. G.	Achondrites Posters, Tue, p.m., HMMB Floor One
Lunning N. G. *	Achondrites, Thu, a.m., Sibley Auditorium
Lunning N. G.	Chondrites, Fri, a.m., Sibley Auditorium
Lupovka V.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
?uszczek K.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Ly A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Lyon I.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Lyon I. C. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Lyon I. C.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Lyon I. C.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Lyons T. W.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Lyytinen E.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Ma C. *	CAIs, Tue, a.m., Stanley Hall Room 105
Ma C.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Ma C.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Ma C.	CAIs Posters, Tue, p.m., HMMB Floor Two
Ma C.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Macalady J. L.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
MacArthur J. L.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Macke R. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Mac Low M.-M.	Chondrule Posters, Tue, p.m., HMMB Floor One
MacPherson G. J.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Maden C.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Maden C.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Maden C.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Maden C.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Mahmood S. S.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Maksimova A. A.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Maltsev O. V. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Mane P. *	CAIs, Tue, a.m., Stanley Hall Room 105
Marhas K. K.	CAIs, Tue, a.m., Stanley Hall Room 105
Marhas K. K.	CAIs Posters, Tue, p.m., HMMB Floor Two
Markley M. M.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Marrocchi Y.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Martinez J. E.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Martinez M. H. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Martínez-Frías J.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Marty B.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Materese C. K.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Matney M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Matsumoto M.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Matsumoto T.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Matsuoka M.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Matsuoka M.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Matsuya M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Matteini M.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Matzel J. *	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Mayne R. G. *	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
McAdam A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
McCleod A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
McCord T. B.	Achondrites, Thu, a.m., Sibley Auditorium
McCoy T. J. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
McCoy T. J.	Chondrites, Fri, a.m., Sibley Auditorium
McCoy T. J.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
McCubbin F.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
McCubbin F. M.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
McCubbin F. M.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
McFadden L. A. *	Achondrites, Thu, a.m., Sibley Auditorium
McKeegan K. D. *	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
McKeegan K. D.	CAIs, Tue, a.m., Stanley Hall Room 105
McKeegan K. D.	Lunar Samples, Tue, a.m., Sibley Auditorium
McKeegan K. D.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
McKeegan K. D.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
McNally C. P.	Chondrule Posters, Tue, p.m., HMMB Floor One

McSween H. Y. *	Asteroids and Comets, Tue, a.m., Sibley Auditorium
McSween H. Y.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
McSween H. Y.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
McSween H. Y. Jr.	Achondrites Posters, Tue, p.m., HMMB Floor One
McSween H. Y. Jr.	Achondrites, Thu, a.m., Sibley Auditorium
Meier M. M. M. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Meier M. M. M.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Melosh H. J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Mendes J. C.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Mengel K.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Merchel S.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Meshik A.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Meshik A.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Meshik A.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Meshik A. P. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Messenger S.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Messenger S.	CAIs, Tue, a.m., Stanley Hall Room 105
Messenger S.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Messenger S.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Messenger S. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Messenger S.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Metzler K.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Metzler K. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Metzler K.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Metzler K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Meyer B. S. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Miao B. K.	Achondrites Posters, Tue, p.m., HMMB Floor One
Miao B. K.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Michalski J. R. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Mihira T.	Achondrites, Thu, a.m., Sibley Auditorium
Mikouchi T.	Achondrites Posters, Tue, p.m., HMMB Floor One
Mikouchi T.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Mikouchi T. *	Achondrites, Thu, a.m., Sibley Auditorium
Mikouchi T.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Miller P. L.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Mirnejad H.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Mishra R. K. *	CAIs, Tue, a.m., Stanley Hall Room 105
Mishra R. K.	CAIs Posters, Tue, p.m., HMMB Floor Two
Mitsunari T.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Mittlefehldt D. W.	Achondrites Posters, Tue, p.m., HMMB Floor One
Mittlefehldt D. W. *	Chondrites, Fri, a.m., Sibley Auditorium
Miura Y.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Miyahara M.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Miyake A.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Miyake A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Moggi Cecchi V.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Mohr-Westheide T. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Moilainen J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Molesky M. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Monechi S.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Montanari A.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Monteiro F. A.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Moody S.	CAIs, Tue, a.m., Stanley Hall Room 105
Moore J.	Chondrites, Fri, a.m., Sibley Auditorium
Mori S.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Moroz L. V.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Morris M. A. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Moser D. E.	Lunar Samples, Tue, a.m., Sibley Auditorium
Moser S.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Moustard F.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Moutanabbir O.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Moynier F. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Moynier F.	Achondrites, Thu, a.m., Sibley Auditorium
Muftakhetdinova R. F.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Murty S. V. S. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Muttik N.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Muxworthy A. R.	Chondrule Posters, Tue, p.m., HMMB Floor One
Muxworthy A. R. *	Chondrites, Fri, a.m., Sibley Auditorium
Nagahara H.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Nagao K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One

Nagao K.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Nagao K.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Nagao K.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Nagaoka H. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Nagaoka H.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Nagashima K.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Nagashima K.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Nagashima K.	CAIs, Tue, a.m., Stanley Hall Room 105
Nagashima K.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Nagashima K.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Nagashima K.	CAIs Posters, Tue, p.m., HMMB Floor Two
Naito M.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Najorka J.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Nakamura T. *	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Nakamura T.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Nakamura T.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Nakamura T.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Nakamura-Messenger K.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Nakamura-Messenger K. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Nakamura-Messenger K.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Nakashima D.	CAIs, Tue, a.m., Stanley Hall Room 105
Nakashima D.	Chondrule, Tue, p.m., Stanley Hall Room 105
Nakashima D.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Nakashima D.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Nakato A.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Nakato A.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Nakato A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Nakatsubo S.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Nakauchi Y.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Nathues A.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Needham A. W. *	CAIs, Tue, a.m., Stanley Hall Room 105
Needham A. W.	CAIs Posters, Tue, p.m., HMMB Floor Two
Nemchin A. A.	Lunar Samples, Tue, a.m., Sibley Auditorium
Nguyen A. N. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Nguyen A. N.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Nguyen A. N.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Niles P.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Niles P. B.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Nishido H.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Nishiizumi K.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Nishio-Hamane D.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Nittler L. R. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Nittler L. R.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Nittler L. R.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Noguchi T.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Nuevo M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Nunes G. A.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Nuth J. A. III *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Nyquist L. E.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Nyquist L. E. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
O'Brien D. P.	Achondrites, Thu, a.m., Sibley Auditorium
Oezdemir S.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Ogliore R. C.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Ogliore R. C. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Ohnishi I.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Ohtani E.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Okada T.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Okazaki R.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Okubo A.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Okumura S.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Ortega-Gutiérrez F.	Chondrule Posters, Tue, p.m., HMMB Floor One
Orthous-Daunay F.-R. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Osawa T.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Oshtrakh M. I.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Oshtrakh M. I.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Osinski G. R.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Ostrowski D.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Ostrowski D. R.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Owen J. M.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Pack A.	Chondrule, Tue, p.m., Stanley Hall Room 105

Reimold W. U.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Remusat L. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Remusat L.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Rice J. W.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Rice M. S.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Richardson M. L. A.	Chondrule, Tue, p.m., Stanley Hall Room 105
Riebe M. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Riebe M.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Righter K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Righter K.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Righter K. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Righter M.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Righter M.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Ringer S. P.	CAIs, Tue, a.m., Stanley Hall Room 105
Ringer S. P.	Chondrites, Fri, a.m., Sibley Auditorium
Rivard C.	Chondrule, Tue, p.m., Stanley Hall Room 105
Rivers M. L.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Roberts R. V.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Rocha M. G.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Rochette P.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Rochette P.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Rochette P.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Rochette P.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Rochette P.	Impact Cratering: Magnetics and Planetary-Scale Impacts Posters, Tue, p.m., HMMB Floor Three
Roller G.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Romaniello S. J.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Root R.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Roperch P.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Ross A. J.	Achondrites, Thu, a.m., Sibley Auditorium
Ross D. K.	CAIs, Tue, a.m., Stanley Hall Room 105
Ross D. K.	CAIs Posters, Tue, p.m., HMMB Floor Two
Rost D.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Roszjar J.	Achondrites, Thu, a.m., Sibley Auditorium
Roth A. S. G. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Roth A. S. G.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Rubin A. E. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Rubin A. E.	Chondrule Posters, Tue, p.m., HMMB Floor One
Rubin A. E.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Rugel G.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Russell C. T.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Russell S. S.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Russell S. S.	Chondrule Posters, Tue, p.m., HMMB Floor One
Russell S. S.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Russell S. S.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Russell S. S.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Russell S. S.	Chondrites, Fri, a.m., Sibley Auditorium
Ruzicka A. M.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Ruzicka A. M.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Ruzicka A. M. *	Chondrites, Fri, a.m., Sibley Auditorium
Ruzie L.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Sahoui R.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Sakaguchi I.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Sakai M. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Sakamoto N.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Sakamoto N.	CAIs, Tue, a.m., Stanley Hall Room 105
Salge T.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Salge T.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Salge T.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Sanborn M.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Sanborn M. E.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Sanborn M. E.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Sanborn M. E.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Sanborn M. E.	Chondrites, Fri, a.m., Sibley Auditorium
Sanders i. S. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Sandford S. A.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Sansom E. K. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Sansom E. K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Santos A. R. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Sapers H. M. *	Advanced Techniques, Mon, a.m., Sibley Auditorium
Satterwhite C. E.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One

Smith C. L.	Achondrites, Thu, a.m., Sibley Auditorium
Smith C. L.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Smith R. L. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Smith T. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Smith T.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Snape J. F. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Snead C. J. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Sonzogni C.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Souders A. K.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Souders A. K.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Sparkes R.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Spring N. H.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Starkey N. A.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Starkey N. A.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Starkey N. A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Starkey N. A. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Steele A.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Steele A.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Steele A.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Steinhardt P. J.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Stephan T. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Stephen N. R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Stolper E. M.	CAIs, Tue, a.m., Stanley Hall Room 105
Strait M. M.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Strait M. M.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Strait M. M.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Stroud R. M. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Stroud R. M.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Stroud R. M.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Sugiyama K.	Achondrites, Thu, a.m., Sibley Auditorium
Suttle M. D.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Sutton S. R.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Suzuki T. T.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Swanson-Hysell N. L.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Swift D.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Swindle T. D.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Swisher C. C.	Achondrites, Thu, a.m., Sibley Auditorium
Swisher C. C. III	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Swisher C. C. III	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Swisher C. C. III	Achondrites, Thu, a.m., Sibley Auditorium
Swisherr C. III	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Sykes D.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Sykes M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Szurgot M.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Tabata M.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Tachibana S.	Chondrule, Tue, p.m., Stanley Hall Room 105
Tachibana S. *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Tachibana T.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Tait K. T.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Tajika E.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Takahashi H.	Chondrites, Fri, a.m., Sibley Auditorium
Takahashi R.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Takeda H.	Lunar Samples, Tue, a.m., Sibley Auditorium
Takenouchi A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Tang H. *	CAIs, Tue, a.m., Stanley Hall Room 105
Tanpopo Project Team	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Tartèse R.	Lunar Samples, Tue, a.m., Sibley Auditorium
Tassinari M.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Tatischeff V.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Taylor C. A.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Taylor L. A.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Taylor L. A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Taylor L. A.	Achondrites, Thu, a.m., Sibley Auditorium
Teiser J.	Chondrule Posters, Tue, p.m., HMMB Floor One
ten Kate I. L.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Tenner T. J.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Tenner T. J.	CAIs, Tue, a.m., Stanley Hall Room 105
Tenner T. J. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Tenner T. J.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Terada K.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105

Terfelt F.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Thiemens M.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Thiemens M. H.	Lunar Samples, Tue, a.m., Sibley Auditorium
Thirlwall M.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Thissen R.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Thomas-Keprta K. L.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Thomen A.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Thompson L. M.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Thompson M. S. *	Lunar Samples, Tue, a.m., Sibley Auditorium
Tielens A. G. G. M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Tikoo S. M. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Till C.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Timms N. E.	Chondrites, Fri, a.m., Sibley Auditorium
Tissot F. L. H.	CAIs, Tue, a.m., Stanley Hall Room 105
Tkalcec B. J.	Achondrites Posters, Tue, p.m., HMMB Floor One
Tomeoka K.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Tomeoka K. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Tomkins A. G.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Tomlinson A.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Torrano Z. A.	Chondrites, Fri, a.m., Sibley Auditorium
Tosi A.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Tosi F.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Towbin W. H.	Chondrule, Tue, p.m., Stanley Hall Room 105
Towner M. C.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Trappitsch R. *	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Treiman A.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Treiman A. H.	Achondrites Posters, Tue, p.m., HMMB Floor One
Treiman A. H. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Trieloff M. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Trieloff M.	Volatiles in the Solar System Posters, Tue, p.m., HMMB Floor One
Trieloff M.	Chondrites, Fri, a.m., Sibley Auditorium
Trigo-Rodríguez J. M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Trimby P. W.	CAIs, Tue, a.m., Stanley Hall Room 105
Trimby P. W.	Chondrites, Fri, a.m., Sibley Auditorium
Tschauner O.	CAIs, Tue, a.m., Stanley Hall Room 105
Tsuchiyama A.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Tsuchiyama A. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Tucker K.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Turner N. J.	Chondrule, Tue, p.m., Stanley Hall Room 105
Turrin B.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Turrin B. D.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Turrin B. D.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Turrin B. D. *	Achondrites, Thu, a.m., Sibley Auditorium
Uchino K.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Uesugi M.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Uesugi M.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Umehara M.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Ushikubo T.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Ushikubo T.	Chondrule, Tue, p.m., Stanley Hall Room 105
Ustinova G. K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Utas J. A. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Vaccaro E.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Vaccaro E. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Valadares G. C. F.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Valenzuela M. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Van Ginneken M.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Van Ginneken M.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Van Roosbroek N.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Vantin E.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Velbel M. A.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Velcic M.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Verdier M. J.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Verosub K. L.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Vieira L. C.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Vinogradoff V. *	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Vokhmintsev A. S.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Vollmer C.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
von der Handt A.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
von Glehn A.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Voropaev S.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One

Vuitton V.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Wadhwa M.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Wadhwa M.	CAIs, Tue, a.m., Stanley Hall Room 105
Wadhwa M. *	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Waeselmann N.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Waeselmann N.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Wakita S.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Wallace S.	Advanced Techniques, Mon, a.m., Sibley Auditorium
Walton E. L. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Walton E. L.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Wang A.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Wang C.-K.	CAIs, Tue, a.m., Stanley Hall Room 105
Wang H.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Wang J.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Wang J.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Wang K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Wang L. Y.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Wang S. J.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Wang S. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Wang Y.	Achondrites Posters, Tue, p.m., HMMB Floor One
Wannek D. L. M.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Ward D. *	Achondrites, Thu, a.m., Sibley Auditorium
Warren P. H. *	Achondrites, Thu, a.m., Sibley Auditorium
Wasserburg G. J.	CAIs Posters, Tue, p.m., HMMB Floor Two
Wasson J. T.	Chondrule, Tue, p.m., Stanley Hall Room 105
Wasson J. T.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Wasson J. T.	Chondrule Posters, Tue, p.m., HMMB Floor One
Wasson J. T.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Weber P.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Wegner W. *	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Weinstein I. A.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Weisberg M. K. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Weisberg M. K.	Chondrites, Fri, a.m., Sibley Auditorium
Westphal A.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Westphal A. J.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Wetteland C. J. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
White A. J.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Whitehouse M. J.	Lunar Samples, Tue, a.m., Sibley Auditorium
Whitehouse M. J.	Achondrites, Thu, a.m., Sibley Auditorium
Wiederhold J. G.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Wielandt D.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Wieler R.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Wieler R.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Wieler R.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Wiens R. C.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Wiesman H.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Wilk J.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Wilk J.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Williams J. T. *	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Williford K.	Mars and Martian Meteorites Posters, Tue, p.m., HMMB Floor One
Wimmer K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Winarski R.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Winkler R. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Winslow F. D.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Wirth R.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Wirth R.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Wozniakiewicz P. J.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Wu T. D.	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Wu Y. X. Sr.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Wünnemann K. *	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Wurm G.	Chondrule Posters, Tue, p.m., HMMB Floor One
Xia Z. P.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Xie Z.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Xu L.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Yabuta H.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Yabuta H.	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Yabuta H. *	Microsamples Analysis, Fri, a.m., Stanley Hall Room 105
Yada T.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Yakame S.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Yakovlev G.	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium

Yakovlev G. A.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Yakovlev G. A.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Yakovlev G. A.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Yamagishi A.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Yamaguchi A.	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Yamaguchi A.	Petrology and Geochemistry of Lunar Rocks Posters, Tue, p.m., HMMB Floor Three
Yamaguchi A.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Yamamoto D. *	Chondrule, Tue, p.m., Stanley Hall Room 105
Yamamoto Y.	Hydrated Carbonaceous Chondrites Posters, Tue, p.m., HMMB Floor One
Yamashita K.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Yamashita S.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Yang L.	CAIs, Tue, a.m., Stanley Hall Room 105
Yang S.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Yano H.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Yasuhara A.	Achondrites, Thu, a.m., Sibley Auditorium
Yazzie C. A.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Yesiltas M. *	Advanced Techniques, Mon, a.m., Sibley Auditorium
Yesiltas M.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Yi K.	Lunar Samples, Tue, a.m., Sibley Auditorium
Yi K.	Chondrites, Fri, a.m., Sibley Auditorium
Yin Q.	Chondrites, Fri, a.m., Sibley Auditorium
Yin Q.-Z. *	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Yin Q.-Z.	Chondrule, Tue, p.m., Stanley Hall Room 105
Yin Q.-Z.	Advanced Techniques Posters, Tue, p.m., HMMB Floor One
Yin Q.-Z.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Yin Q.-Z.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Yin Q.-Z.	Early Solar System Chronology Posters, Tue, p.m., HMMB Floor Two
Yin Q.-Z.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMB Floor Two
Yokobori S.	Microsample Analysis Posters, Tue, p.m., HMMB Floor Two
Yokochi R.	Volatiles in the Solar System, Thu, a.m., Stanley Hall Room 105
Yokoyama E.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three
Yoneda S.	Lunar Samples, Tue, a.m., Sibley Auditorium
Young E. D.	Achondrites, Thu, a.m., Sibley Auditorium
Young E. D. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Yurimoto H.	Early Solar System Chronology, Mon, p.m., Stanley Hall Room 105
Yurimoto H.	CAIs, Tue, a.m., Stanley Hall Room 105
Yurimoto H. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Yurimoto H.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Zaag P. T.	Impacts: Glasses and Melts, Mon, a.m., Sibley Auditorium
Zanda B. *	Exposure History and Delivery of Meteorites, Tue, p.m., Sibley Auditorium
Zanda B.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Zanda B.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Zega T. J.	Lunar Samples, Tue, a.m., Sibley Auditorium
Zega T. J.	Presolar Grains and Isotopic Anomalies Posters, Tue, p.m., HMMBFloor Two
Zeng X. J.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Zhang J.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Zhang M.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Zhu M. H.	Impacts: Shattering, Shocking, Bombarding, Mon, p.m., Sibley Auditorium
Ziegler K.	Achondrites Posters, Tue, p.m., HMMB Floor One
Ziegler K.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Ziegler K.	Ordinary Chondrites Posters, Tue, p.m., HMMB Floor One
Ziegler K.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Ziegler K.	Mars and Martian Meteorites, Thu, p.m., Sibley Auditorium
Ziegler K.	Chondrites, Fri, a.m., Sibley Auditorium
Ziegler K.	Irons and Stony-Irons, Fri, p.m., Stanley Hall Room 105
Zinner E.	Presolar Grains and Isotopic Anomalies, Mon, a.m., Stanley Hall Room 105
Zipfel J.	Carbonaceous Chondrite Parent Bodies Posters, Tue, p.m., HMMB Floor One
Zipfel J. *	Hydrated Carbonaceous Chondrites, Thu, p.m., Stanley Hall Room 105
Zolensky M.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Zolensky M.	Achondrites, Thu, a.m., Sibley Auditorium
Zolensky M. E. *	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Zolensky M. E.	Organics in Meteorites Posters, Tue, p.m., HMMB Floor One
Zolensky M. E.	Organics in Meteorites, Fri, p.m., Sibley Auditorium
Zolotov M. Yu. *	Asteroids and Comets, Tue, a.m., Sibley Auditorium
Zucolotto M. E.	Irons and Stony-Irons Posters, Tue, p.m., HMMB Floor One
Zucolotto M. E.	Exposure History and Delivery of Meteorites Posters, Tue, p.m., HMMB Floor One
Zuo S.	Impact Cratering: Mapping, Melting, Shock Effects Posters, Tue, p.m., HMMB Floor Three