

Volume 37 2002

The Year at a Glance

From the Editors

D. W. G. SEARS: The Meteoritical Society meeting abstracts	3
D. W. G. SEARS: 2001 Appreciations	4
S. A. SANDFORD: Concentrating Antarctic meteorites on blue ice fields—The Frontier Mountain meteorite trap	151
E. I. CHIANG: Chondrules and nebular shocks	151
K. MARTI: Heavy noble gases in solar system matter	153
A. KRACHER: Mercury 2001 conference, Field Museum, Chicago, Illinois, 2001 October 4–5	307
V. A. FERNANDES: New views on the Moon—Europe: Future lunar exploration, science objectives and integration of datasets, DLR-Berlin, Germany, 2002 January 14–16	309
D. S. LAURETTA: Opaque minerals in primitive stony meteorites	475
H. BUSEMANN: About noble gases in E chondrites	476
P. G. BROWN, A. R. HILDEBRAND AND M. E. ZOLENSKY: Tagish Lake	619
F. J. M. RIETMEIJER: And just when you thought that the Leonid meteor storm held no more surprises: The 2001 storm	899
D. W. G. SEARS: Learned societies, leadership, journals and the progress of planetary science	1641
W. F. HUEBNER AND J. M. GREENBERG: Workshop summary on physical and chemical properties of potential Earth impactors	1642
D. A. KRING: Reevaluating the impact cratering kill curve	1648
D. W. G. SEARS: 2002 Appreciations	1650

Awards of the Meteoritical Society—2001

M. J. DRAKE: 2001 Leonard Medal Citation for Harry Y. McSween, Jr.	5
H. Y. MCSWEEN, JR.: The Leonard Medal Address: The rocks of Mars, from far and near	7
B. F. FEGLEY, JR.: 2002 Nier Prize Citation	A7
D. BRITT: Best Student Paper in Planetary Sciences Award for 2000	A7

Invited Reviews

A. N. KROT, A. MEIBOM, M. K. WEISBERG AND K. KEIL: The CR chondrite clan: Implications for early solar system processes	1451
M. S. ROBINSON, P. C. THOMAS, J. VEVERKA, S. L. MURCHIE AND B. B. WILCOX: The geology of 433 Eros	1651
R. GREENBERG AND P. GEISSLER: Europa's dynamic icy crust	1685

Articles

S. S. ASSONOV, I. A. FRANCHI, C. T. PILLINGER, A. S. SEMENOVA, YU. A. SHUKOLYUKOV, A. B. VERCHOVSKY AND A. N. IASSEVITCH: Nitrogen and argon release profiles in Luna 16 and Luna 24 regolith samples: The effects of regolith reworking	27
J. N. GROSSMAN, CONEL M. O'D. ALEXANDER, J. WANG AND A. J. BREARLEY: Zoned chondrules in Semarkona: Evidence for high- and low-temperature processing	49
H. K. GASTINEAU-LYONS, H. Y. MCSWEEN, JR. AND M. J. GAFFEY: A critical evaluation of oxidation <i>versus</i> reduction during metamorphism of L and LL group chondrites, and implications for asteroid spectroscopy	75
A. N. KROT AND K. KEIL: Anorthite-rich chondrules in CR and CH carbonaceous chondrites: Genetic link between calcium-aluminum-rich inclusions and ferromagnesian chondrules	91
R. HUTCHISON: Major element fractionation in chondrites by distillation in the accretion disk of a T Tauri Sun?	113
A. E. RUBIN, M. E. ZOLENSKY AND R. J. BODNAR: The halite-bearing Zag and Monahans (1998) meteorite breccias: Shock metamorphism, thermal metamorphism and aqueous alteration on the H-chondrite parent body	125
A. N. KROT, I. D. HUTCHEON AND K. KEIL: Plagioclase-rich chondrules in the reduced CV chondrites: Evidence for complex formation history and genetic links between calcium-aluminum-rich inclusions and ferromagnesian chondrules	155
S. J. DESCH AND H. C. CONNOLLY, JR.: A model of the thermal processing of particles in solar nebula shocks: Application to the cooling rates of chondrules	183
L. FOLCO, A. CAPRA, M. CHIAPPINI, M. FREZZOTTI, M. MELLINI AND I. E. TABACCO: The Frontier Mountain meteorite trap (Antarctica)	209
X. HUA, J. WANG AND P. R. BUSECK: Fine-grained rims in the Allan Hills 81002 and Lewis Cliff 90500 CM2 meteorites: Their origin and modification	229
C. M. O'D. ALEXANDER: Application of MELTS to kinetic evaporation models of FeO-bearing silicate melts	245
C. M. HOHENBERG, N. THONNARD AND A. MESHNIK: Active capture and anomalous adsorption: New mechanisms for the incorporation of heavy noble gases	257
P. W. HAINES AND D. J. RAWLINGS: The Foelsche structure, Northern Territory, Australia: An impact crater of probable Neoproterozoic age	269
A. GRESHAKE, A. N. KROT, A. MEIBOM, M. K. WEISBERG, M. E. ZOLENSKY AND K. KEIL: Heavily-hydrated lithic clasts in CH chondrites and the related, metal-rich chondrites Queen Alexandra Range 94411 and Hammadah al Hamra 237	281
T. E. FERKO, M-S. WANG, D. J. HILLEGONDS, M. E. LIPSCHUTZ, R. HUTCHISON, L. FRANKE, P. SCHERER, L. SCHULTZ, P. H. BENOIT, D. W. G. SEARS, A. K. SINGHVI AND N. BHANDARI: The irradiation history of the Ghubara (L5) regolith breccia	311
M. D. NORMAN AND D. W. MITTFELDLT: Impact processing of chondritic planetesimals: Siderophile and volatile element fractionation in the Chico L chondrite	329

D. W. MITTFELDLT, M. KILLGORE AND M. T. LEE: Petrology and geochemistry of D'Orbigny, geochemistry of Sahara 99555, and the origin of angrites	345
T. J. FAGAN, G. J. TAYLOR, K. KEIL, T. E. BUNCH, J. H. WITTKER, R. L. KOROTEV, B. L. JOLLIFF, J. J. GILLIS, L. A. HASKIN, E. JAROSEWICH, R. N. CLAYTON, T. K. MAYEDA, V. A. FERNANDES, R. BURGESS, G. TURNER, O. EUGSTER AND S. LORENZETTI: Northwest Africa 032: Product of lunar volcanism	371
J. M. EILER, N. KITCHEN, L. LESHIN AND M. STRAUSBERG: Hosts of hydrogen in Allan Hills 84001: Evidence for hydrous martian salts in the oldest martian meteorite?	395
J. F. MCHONE, R. GREELEY, K. K. WILLIAMS, D. G. BLUMBERG AND R. O. KUZMIN: Space shuttle observations of terrestrial impact structures using SIR-C and X-SAR radars	407
S. MOSTEFAOUI, N. T. KITA, S. TOGASHI, S. TACHIBANA, H. NAGAHARA AND Y. MORISHITA: The relative formation ages of ferromagnesian chondrules inferred from their initial aluminum-26/aluminum-27 ratios	421
S. GHOSH, S. V. S. MURTY, P. N. SHUKLA, A. D. SHUKLA, R. R. MAHAJAN, N. BHANDARI, N. C. PANT, J. B. GHOSH AND S. SHOME: Fall, classification and cosmogenic records of the Sabrum (LL6) chondrite	439
K. KIRSIMÄE, S. SUUROJA, J. KIRS, A. KÄRKI, M. POLIKARPUS, V. PUURA AND K. SUUROJA: Hornblende alteration and fluid inclusions in Kärdla impact crater, Estonia: Evidence for impact-induced hydrothermal activity	449
J. E. CHAPPELOW AND V. L. SHARPTON: An improved shadow measurement technique for constraining the morphometry of simple impact craters	479
J. A. BARRAT, PH. GILLET, V. SAUTTER, A. JAMBON, M. JAVOY, C. GÖPEL, M. LESOURD, F. KELLER AND E. PETIT: Petrology and chemistry of the basaltic shergottite North West Africa 480	487
F. HÖRZ, D. W. MITTFELDLT, T. H. SEE AND C. GALINDO: Petrographic studies of the impact melts from Meteor Crater, Arizona, USA	501
S. B. SIMON, A. M. DAVIS, L. GROSSMAN AND K. D. MCKEEGAN: A hibonite-corundum inclusion from Murchison: A first-generation condensate from the solar nebula	533
N. BHANDARI, S. V. S. MURTY, P. N. SHUKLA, A. D. SHUKLA, R. R. MAHAJAN, M. M. SARIN, G. SRINIVASAN, K. M. SUTHAR, M. S. SISODIA, S. JHA AND A. BISCHOFF: Itawa Bhopji (L3-5) chondrite regolith breccia: Fall, classification, and cosmogenic records	549
P. SCHAAP AND D. MÜLLER-SOHNUS: Strontium and neodymium isotopic study of Libyan Desert Glass: Inherited Pan-African age signatures and new evidence for target material	565
Y. LIN AND A. EL GORESY: A comparative study of opaque phases in Qingzhen (EH3) and MacAlpine Hills 88136 (EL3): Representatives of EH and EL parent bodies	577
A. PATZER AND L. SCHULTZ: Noble gases in enstatite chondrites II: The trapped component	601
J. WHITEHEAD, R. A. F. GRIEVE AND J. G. SPRAY: Mineralogy and petrology of melt rocks from the Popigai impact structure, Siberia	623
M. BEECH: The Mazapil meteorite: From paradigm to periphery	649
L. A. M. BENNER, S. J. OSTRO, M. C. NOLAN, J.-L. MARGOT, J. D. GIORGINI, R. S. HUDSON, R. F. JURGENS, M. A. SLADE, E. S. HOWELL, D. B. CAMPBELL AND D. K. YEOMANS: Radar observations of asteroid 1999 JM8	779
P. H. BENOIT, G. A. AKRIDGE, K. NINAGAWA AND D. W. G. SEARS: Thermoluminescence sensitivity and thermal history of type 3 ordinary chondrites: Eleven new type 3.0-3.1 chondrites and possible explanations for differences among H, L, and LL chondrites	793
P. C. BUCHANAN AND W. U. REIMOLD: Planar deformation features and impact glass in inclusions from the Vredefort Granophyre, South Africa	807
A. PATZER, D. H. HILL, W. V. BOYNTON, L. FRANKE, L. SCHULTZ, A. J. T. JULL, L. R. MCHARGUE AND I. A. FRANCHI: Itqiy: A study of noble gases and oxygen isotopes including its terrestrial age and a comparison with Zakłodzie	823
E. GNOS, B. HOFMANN, I. A. FRANCHI, A. AL-KATHIRI, M. HAUSER AND L. MOSER: Sayh al Uhaymir 094: A new martian meteorite from the Oman desert	835
A. J. WESTPHAL, C. SNEAD, J. BORG, E. QUIRICO, P.-I. RAYNAL, M. E. ZOLENSKY, G. FERRINI, L. COLANGELI AND P. PALUMBO: Small hypervelocity particles captured in aerogel collectors: Location, extraction, handling and storage	855
R. D. LORENZ, A. J. T. JULL, T. D. SWINDLE AND J. I. LUNINE: Radiocarbon on Titan	867
A. L. CORTÉS, E. DÍAZ-MARTÍNEZ, E. SANZ-RUBIO, J. MARTÍNEZ-FRÍAS AND C. FERNÁNDEZ: Cosmic impact <i>versus</i> terrestrial origin of the Azuara structure (Spain): A review	875
H. C. VERMA, C. UPADHYAY, A. TRIPATHI, R. P. TRIPATHI AND N. BHANDARI: Thermal decomposition pattern and particle size estimation of iron minerals associated with the Cretaceous-Tertiary boundary at Gubbio	901
T. OSAWA AND K. NAGAO: Noble gas compositions of Antarctic micrometeorites collected at the Dome Fuji Station in 1996 and 1997	911
P. WASILEWSKI, M. H. ACUÑA AND G. KLETETSCHKA: 433 Eros: Problems with the meteorite magnetism record in attempting an asteroid match	937
E. GILABERT, B. LAVIELLE, R. MICHEL, I. LEYA, S. NEUMANN AND U. HERPERS: Production of krypton and xenon isotopes in thick stony and iron targets isotropically irradiated with 1600 MeV protons	951
L. BAKER, I. A. FRANCHI, I. P. WRIGHT AND C. T. PILLINGER: The oxygen isotopic composition of water from Tagish Lake: Its relationship to low-temperature phases and to other carbonaceous chondrites	977

C. D. K. HERD, C. S. SCHWANDT, J. H. JONES AND J. J. PAPIKE: An experimental and petrographic investigation of Elephant Moraine 79001 lithology A: Implications for its petrogenesis and the partitioning of chromium and vanadium in a martian basalt	987
E. ZINNER AND C. GÖPEL: Aluminum-26 in H4 chondrites: Implications for its production and its usefulness as a fine-scale chronometer for early solar system events	1001
I. LEYA, R. WIELER, P. MA, C. SCHNABEL AND G. F. HERZOG: Pre-atmospheric depths and thermal histories of Canyon Diablo spheroids	1015
S. P. KELLEY AND E. GUROV: Boltysh, another end-Cretaceous impact	1031
V. K. RAI, S. V. S. MURTY AND U. OTT: Nitrogen in diamond-free ureilite Allan Hills 78019: Clues to the origin of diamond in ureilites	1045
R. L. FOLK AND L. A. TAYLOR: Nannobacterial alteration of pyroxenes in martian meteorite Allan Hills 84001	1057
P. JENNISKENS, E. TEDESCO, J. MURTHY, C. O. LAUX AND S. PRICE: Spaceborne ultraviolet 251–384 nm spectroscopy of a meteor during the 1997 Leonid shower	1071
J. SCHLÜTER, L. SCHULTZ, F. THIEDIG, B. O. AL-MAHDI AND A. E. ABU AGHREB: The Dar al Gani meteorite field (Libyan Sahara): Geological setting, pairing of meteorites, and recovery density	1079
A. F. CHENG, N. IZENBERG, C. R. CHAPMAN AND M. T. ZUBER: Ponded deposits on asteroid 433 Eros	1095
L. A. TAYLOR, M. A. NAZAROV, C. K. SHEARER, H. Y. MCSWEEN, JR., J. CAHILL, C. R. NEAL, M. A. IVANOVA, L. D. BARSUKOVA, R. C. LENTZ, R. N. CLAYTON AND T. K. MAYEDA: Martian meteorite Dhofar 019: A new shergottite	1107
C. FLOSS: Queen Alexandra Range 93148: A new type of pyroxene pallasite?	1129
A. JAMBON, J. A. BARRAT, V. SAUTTER, PH. GILLET, C. GÖPEL, M. JAVOY, J. L. JORON AND M. LESOURD: The basaltic shergottite Northwest Africa 856: Petrology and chemistry	1147
C. S. COCKELL, P. LEE, G. OSINSKI, G. HORNECK AND P. BROADY: Impact-induced microbial endolithic habitats	1287
C. FERRARIS, L. FOLCO AND M. MELLINI: Chondrule thermal history from unequilibrated H chondrites: A transmission and analytical electron microscopy study	1299
K. KEHM, G. J. FLYNN, S. R. SUTTON AND C. M. HOHENBERG: Combined noble gas and trace element measurements on individual stratospheric interplanetary dust particles	1323
M. A. IVANOVA, M. I. PETAEV, G. J. MACPHERSON, M. A. NAZAROV, L. A. TAYLOR AND J. A. WOOD: The first known natural occurrence of calcium monoaluminate, in a calcium-aluminum-rich inclusion from the CH chondrite Northwest Africa 470	1337
O. EUGSTER, H. BUSEMANN, S. LORENZETTI AND D. TERRIBILINI: Ejection ages from krypton-81–krypton-83 dating and pre-atmospheric sizes of martian meteorites	1345
V. E. NELSON AND A. E. RUBIN: Size-frequency distributions of chondrules and chondrule fragments in LL3 chondrites: Implications for parent-body fragmentation of chondrules	1361
L. TISSANDIER, G. LIBOUREL AND F. ROBERT: Gas–melt interactions and their bearing on chondrule formation	1377
R. D. VIS, A. MROWIEC, P. J. KOOYMAN, K. MATSUBARA AND D. HEYMANN: Microscopic search for the carrier phase Q of the trapped planetary noble gases in Allende, Leoville, and Vigarano	1391
D. M. SCHNEIDER, S. J. K. SYMES, P. H. BENOIT AND D. W. G. SEARS: Properties of chondrules in EL3 chondrites, comparison with EH3 chondrites, and the implications for the formation of enstatite chondrites	1401
M. KIMURA, H. HIYAGON, H. PALME, B. SPETTEL, D. WOLF, R. N. CLAYTON, T. K. MAYEDA, T. SATO, A. SUZUKI AND H. KOJIMA: Yamato 792947, 793408 and 82038: The most primitive H chondrites, with abundant refractory inclusions	1417
M. CONNORS, P. CHODAS, S. MIKKOLA, P. WIEGERT, C. VEILLET AND K. INNANEN: Discovery of an asteroid and quasi-satellite in an Earth-like horseshoe orbit	1435
S. MESSENGER: Opportunities for the stratospheric collection of dust from short-period comets	1491
J. ORMÖ, A. P. ROSSI AND G. KOMATSU: The Sirente crater field, Italy	1507
J. E. CHAMBERS AND P. CASSEN: The effects of nebula surface density profile and giant-planet eccentricities on planetary accretion in the inner solar system	1523
F. LANGENHORST, J-P. POIRIER, A. DEUTSCH AND U. HORNEMANN: Experimental approach to generate shock veins in single crystal olivine by shear melting	1541
C-H. LO, K. T. HOWARD, S-L. CHUNG AND S. MEFFRE: Laser fusion argon-40/argon-39 ages of Darwin impact glass	1555
R. J. M. OLSON AND J. M. PASACHOFF: Comets, meteors, and eclipses: Art and science in early Renaissance Italy	1563
M. HONDA, M. W. CAFFEE, Y. N. MIURA, H. NAGAI, K. NAGAO AND K. NISHIZUMI: Cosmogenic nuclides in the Brenham pallasite	1711
J. ALÉON, A. N. KROT AND K. D. MCKEEGAN: Calcium-aluminum-rich inclusions and amoeboid olivine aggregates from the CR carbonaceous chondrites	1729
W. H. SCHWARZ AND H. J. LIPPOLT: Coeval argon-40/argon-39 ages of moldavites from the Bohemian and Lusatian strewn fields	1757
D. BRANDT, H. HOLMES, W. U. REIMOLD, B. K. PAYA, C. KOEBERL AND P. J. HANCOX: Kgagodi Basin: The first impact structure recognized in Botswana	1765
L. J. CHIZMADIA, A. E. RUBIN AND J. T. WASSON: Mineralogy and petrology of amoeboid olivine inclusions in CO3 chondrites: Relationship to parent-body aqueous alteration	1781
I. J. DAUBAR, D. A. KRING, T. D. SWINDLE AND A. J. T. JULL: Northwest Africa 482: A crystalline impact-melt breccia from the lunar highlands	1797
M. S. KELLEY AND M. J. GAFFEY: High-albedo asteroid 434 Hungaria: Spectrum, composition and genetic connections	1815

V. K. PEARSON, M. A. SEPHTON, A. T. KEARSLEY, P. A. BLAND, I. A. FRANCHI AND I. GILMOUR: Clay mineral–organic matter relationships in the early solar system	1829
A. BASU, S. J. WENTWORTH AND D. S. MCKAY: Heterogeneous agglutinitic glass and the fusion of the finest fraction (F ³) model	1835
I. OHNISHI AND K. TOMEOKA: Dark inclusions in the Mokoia CV3 chondrite: Evidence for aqueous alteration and subsequent thermal and shock metamorphism	1843
U. B. MARVIN AND M. L. COSMO: Domenico Troili (1766): " <i>The true cause of the fall of a stone in Albereto is a subterranean explosion that hurled the stone skyward</i> "	1857
H. BUSEMANN AND O. EUGSTER: The trapped noble gas component in achondrites	1865
D. STÖFFLER, N. A. ARTEMIEVA AND E. PIERAZZO: Modeling the Ries–Steinheim impact event and the formation of the moldavite strewn field	1893
D. G. SCHMITT: The law of ownership and control of meteorites	B5
A. H. TREIMAN, D. J. LINDSTROM, C. S. SCHWANDT, I. A. FRANCHI AND M. L. MORGAN: A "mesosiderite" rock from northern Siberia, Russia: Not a meteorite	B13
P. ROCHETTE: One meteorite less from Vietnam	B23
M. A. VELBEL, D. J. MATTY, J. F. WACKER AND M. P. LINKE: The Worden meteorite: A new ordinary chondrite fall from Michigan, USA	B25
<i>The Tagish Lake meteorite</i>	
P. G. BROWN, D. O. REVELLE, E. TAGLIAFERRI AND A. R. HILDEBRAND: An entry model for the Tagish Lake fireball using seismic, satellite and infrasound records	661
J. M. FRIEDRICH, M-S. WANG AND M. E. LIPSCHUTZ: Comparison of the trace element composition of Tagish Lake with other primitive carbonaceous chondrites	677
S. PIZZARELLO AND Y. HUANG: Molecular and isotopic analyses of Tagish Lake alkyl dicarboxylic acids	687
G. KMINEK, O. BOTTA, D. P. GLAVIN AND J. L. BADA: Amino acids in the Tagish Lake meteorite	697
D. W. MITTFELDLT: Geochemistry of the ungrouped carbonaceous chondrite Tagish Lake, the anomalous CM chondrite Bells, and comparison with CI and CM chondrites	703
M. M. GRADY, A. B. VERCHOVSKY, I. A. FRANCHI, I. P. WRIGHT AND C. T. PILLINGER: Light element geochemistry of the Tagish Lake CI2 chondrite: Comparison with CI1 and CM2 meteorites	713
M. E. ZOLENSKY, K. NAKAMURA, M. GOUNELLE, T. MIKOUCHI, T. KASAMA, O. TACHIKAWA AND E. TONU: Mineralogy of Tagish Lake: An ungrouped type 2 carbonaceous chondrite	737
A. N. THORPE, F. E. SENFTLE AND J. R. GRANT: Magnetic study of magnetite in the Tagish Lake meteorite	763
<i>The Mercury 2001 workshop</i>	
A. E. POTTER, R. M. KILLEN AND T. H. MORGAN: The sodium tail of Mercury	1165
P. L. KOEHN, T. H. ZURBUCHEN, G. GLOECKLER, R. A. LUNDRÉN AND L. A. FISK: Measuring the plasma environment at Mercury: The fast imaging plasma spectrometer	1173
D. M. HUNTEN AND A. L. SPRAGUE: Diurnal variation of sodium and potassium at Mercury	1191
L. V. POTTS, R. R. B. VON FRESE AND C. K. SHUM: Crustal properties of Mercury by morphometric analysis of multi-ring basins on the Moon and Mars	1197
S. M. MILKOVICH, J. W. HEAD AND L. WILSON: Identification of mercurian volcanism: Resolution effects and implications for MESSENGER	1209
R. M. KILLEN: Source and maintenance of the argon atmospheres of Mercury and the Moon	1223
T. H. BURBINE, T. J. MCCOY, L. R. NITTLER, G. K. BENEDIX, E. A. CLOUTIS AND T. L. DICKINSON: Spectra of extremely reduced assemblages: Implications for Mercury	1233
D. T. BLEWETT, B. R. HAWKE AND P. G. LUCEY: Lunar pure anorthosite as a spectral analog for Mercury	1245
A. L. SPRAGUE, J. P. EMERY, K. L. DONALDSON, R. W. RUSSELL, D. K. LYNCH AND A. L. MAZUK: Mercury: Mid-infrared (3–13.5 μm) observations show heterogeneous composition, presence of intermediate and basic soil types, and pyroxene	1255
S. J. PEALE, R. J. PHILLIPS, S. C. SOLOMON, D. E. SMITH AND M. T. ZUBER: A procedure for determining the nature of Mercury's core	1269
<i>Laboratory simulations of circumstellar dust analog series</i>	
J. A. NUTH, III, F. J. M. RIETMEIJER AND H. G. M. HILL: Condensation processes in astrophysical environments: The composition and structure of cometary grains	1579
C. KOIKE, H. CHIHARA, K. KOIKE, M. NAKAGAWA, M. OKADA, A. TSUCHIYAMA, M. AOKI, T. AWATA AND K. ATOBE: Thermoluminescence of forsterite and fused quartz as a candidate for the extended red emission	1591
P. CARREZ, K. DEMYK, P. CORDIER, L. GENGEMBRE, J. GRIMBLot, L. D'HENDECOURT, A. P. JONES AND H. LEROUX: Low-energy helium ion irradiation-induced amorphization and chemical changes in olivine: Insights for silicate dust evolution in the interstellar medium	1599
P. CARREZ, K. DEMYK, H. LEROUX, P. CORDIER, A. P. JONES AND L. D'HENDECOURT: Low-temperature crystallization of MgSiO ₃ glasses under electron irradiation: Possible implications for silicate dust evolution in circumstellar environments	1615
A. ROTUNDI, J. R. BRUCATO, L. COLANGELI, G. FERRINI, V. MENNELLA, E. PALOMBA AND P. PALUMBO: Production, processing and characterization techniques for cosmic dust analogues	1623

Physical properties of potential Earth impactors: Know your enemy

S. D. PRICE: Infrared observations of asteroids from space: The past and future	1909
T. G. MÜLLER: Thermophysical analysis of infrared observations of asteroids	1919
M. DELBÓ AND A. W. HARRIS: Physical properties of near-Earth asteroids from thermal infrared observations and thermal modeling	1929
T. CHIGAI, T. YAMAMOTO AND T. KOZASA: Heterogeneous condensation of presolar titanium carbide core-graphite mantle spherules	1937
A. SAFAEINILI, S. GULKIS, M. D. HOFSTADTER AND R. L. JORDAN: Probing the interior of asteroids and comets using radio reflection tomography	1953
A. CELLINO, V. ZAPPALA AND E. F. TEDESCO: Near-Earth objects: Origins and need of physical characterization	1965
T. KUDO, A. KOUCHI, M. ARAKAWA AND H. NAKANO: The role of sticky interstellar organic material in the formation of asteroids	1975

Reports

R. G. LIBERMAN, J. O. FERNÁNDEZ NIELLO, M. L. DI TADA, L. K. FIFIELD, J. MASARIK AND R. C. REEDY: Campo del Cielo iron meteorite: Sample shielding and meteoroid's preatmospheric size	295
I. McDONALD: Clearwater East impact structure: A re-interpretation of the projectile type using new platinum-group element data from meteorites	459
C. A. GOODRICH: Olivine-phyric martian basalts: A new type of shergottite	B31
U. B. MARVIN: Oral histories in meteoritics and planetary science: V. Brian Mason	B35
U. B. MARVIN: Oral histories in meteoritics and planetary science: VI. Stuart Ross Taylor	B47
U. B. MARVIN: Oral histories in meteoritics and planetary science: VII. Alastair G. W. Cameron	B57
U. B. MARVIN: Oral histories in meteoritics and planetary science: VIII. Friedrich Begemann	B69
U. B. MARVIN: Oral histories in meteoritics and planetary science: IX. Heinrich Wänke	B79

Comment and Reply

P. NOCKOLD: Comment on "Meteor storm evidence against the recent formation of lunar crater Giordano Bruno" by Paul Withers	465
P. WITHERS: Reply to comment by P. Nockold	466

Catalogs and Inventories

S. S. RUSSELL, J. ZIPFEL, J. N. GROSSMAN AND M. M. GRADY: The Meteoritical Bulletin, No. 86, 2002 July	A157
M. J. MUÑOZ-ESPADAS, J. MARTÍNEZ-FRÍAS, R. LUNAR, B. SÁNCHEZ AND J. SÁNCHEZ: The meteorite collection of the National Museum of Natural Sciences, Madrid, Spain: An updated catalog	B89
L. FOLCO, F. PERI AND F. PEZZOTTA: The meteorite collection of the Civico Planetario and the Museo Civico di Storia Naturale in Milan, Italy	B95

Books and Multimedia Reviews

M. GENGE: <i>Meteorites: Their Impact on Science and History</i> edited by B. Zanda and M. Rotaru	143
M. S. KELLEY: <i>The Universe Unveiled: Instruments and Images through History</i> edited by B. Stephenson, M. Bolt and A. F. Friedman	143
P. E. JANSMA: <i>Physical Principles of Remote Sensing</i> , second edition by W. G. Rees	303
U. B. MARVIN: <i>Exploring the Moon: The Apollo Expeditions</i> by David M. Harland	467
W. E. STITES: <i>Perspectives in Amino Acid and Protein Geochemistry</i> by G. Goodfriend, M. Collins, M. Fogel, S. Macko, and J. Wehmiller	468
C. H. SANDBERG LACY: <i>Our Universe: The Thrill of Extragalactic Exploration as Told by Leading Experts</i> edited by S. Alan Stern	613
D. J. SCHEERES: <i>Solar System Dynamics</i> by C. D. Murray and S. F. Dermott	613
J. BREWER: <i>Astrobiology</i> by Monica Grady	614
P. H. WARREN: <i>Moon Lander</i> by Thomas J. Kelly	615
R. WIELER: <i>Noble Gas Geochemistry</i> by Minoru Ozima and Frank A. Podosek	615
B. E. CLARK: <i>New Cosmic Horizons</i> by David Leverington	773
D. BANERJEE: <i>Chronology and Evolution of Mars</i> edited by R. Kallenbach, J. Geiss and W. K. Hartmann	774
P. ABELL: <i>Higher than Everest: An Adventurer's Guide to the Solar System</i> by Paul Hodge	775
J. R. ARNOLD: <i>Taking Science to the Moon: Lunar Experiments and the Apollo Program</i> by D. A. Beattie	1141
M. BEECH: <i>Leonid Storm Research</i> edited by P. Jenniskens, F. Rietmeijer, N. Brosch and M. Fonda	1141
W. COCHRAN: <i>Distant Wanderers: The Search for Planets Beyond the Solar System</i> by Bruce Dorminey	1443
C. H. SANDBERG LACY: <i>Theoretical Astrophysics: Volume I: Astrophysical Processes</i> by T. Padmanabhan	1443
C. KOEBERL: <i>Tektites in the Geological Record: Showers of Glass from the Sky</i> by Joe McCall	1444
J. L. BADA: <i>Astrobiology: Origins from the Big-Bang to Civilisation</i> edited by Julián Chela-Flores, Guillermo A. Lemarchand and John Oró	1445
L. A. ROE: <i>Chemical Dynamics in Extreme Environments</i> edited by Rainer A. Dressler	1985
A. F. CHENG: <i>Storms in Space</i> by John Freeman	1985

W. U. REIMOLD: <i>Major Impacts and Plate Tectonics: A Model for the Phanerozoic Evolution of the Earth's Lithosphere</i> by Neville J. Price	1987
V. L. MASAITIS: <i>Meteorite Hunter: The Search For Siberian Meteorite Craters</i> by Roy A. Gallant	1988
Memorials	
E. J. OLSEN, K. KEIL AND G. KURAT: Memorial for Kurt Fredriksson	301
Announcements	
Barringer Family Fund for Meteoritic Research	146
Laboratory simulations of circumstellar dust analogs: Expectations for comet nucleus encounters	147
Lunar meteorites and the early cratering and impact chronology of the terrestrial planets	148
European Geophysical Society, General Assembly, Planetary Sciences Program, Nice, France, 2002 April 21–26	304
Call for Nominations: J. Lawrence Smith Medal	895
Unmixing the SNCs: Chemical, isotopic, and petrologic components of martian meteorites	895
The Third International Conference on Magmatism, Metamorphism and Associated Mineralizations "3MA", Casablanca, Morocco, 2003 May 8–10	1027
Impact cratering: Bridging the gap between modeling and observations	1143
Biological processes in impact craters, King's College, University of Cambridge, U.K., 2003 March 29 to April 1	1991
Abstracts of the 65th Annual Meeting of the Meteoritical Society	A9
Meteoritical Society Business	B104