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lunar & planetary information bulletin

NUMBER 22 FEBRUARY 1980

TIME FOR THE ELEVENTH
17-23 March 1980

The Eleventh Lunar and Planetary Science Conference will begin Sunday, March 17 at 6:00 p.m. with registration and an open house at the Lunar and Planetary Institute. A shuttle bus will run between NASA area hotels and the LPI from 5:45 to 9:30 p.m. Registration will continue throughout the conference in the Gilruth Center at JSC.

From a total of 459 abstracts accepted for publication in Lunar and Planetary Science XI, the Program Committee has constructed twenty-three sessions for a total of 285 oral presentations. The sessions are structured along the following broad, problem-oriented topics:

1. Constraints on structure, composition, and history of planetary interiors.
2. Characteristics and movements of materials on lunar, planetary and asteroidal surfaces.
3. Characterization and evolution of volcanic landforms.
4. Characterization and evolution of planetary crusts.
5. Nature and effects of impact processes.
6. Extraterrestrial materials as solar/interplanetary/interstellar probes.
7. Earliest history of the solar system.

The preliminary program included in this issue reflects plans for the Conference as they exist on 11 February. Minor changes may yet occur before the Conference itself. Indexes to the speakers and to the authors of papers in the oral technical sessions will be found following the daily schedules.

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Some CONFERENCE HIGHLIGHTS this year include:

Technical Poster Session will be on exhibit in the Gilruth Center, Monday through Friday. A preliminary list of the 19 poster exhibits now scheduled is included at the end of the author index.

Application of Remote Sensing Techniques to the Study of the Earth Monday evening 8:00 p.m. Gilruth Center, Program p. 7

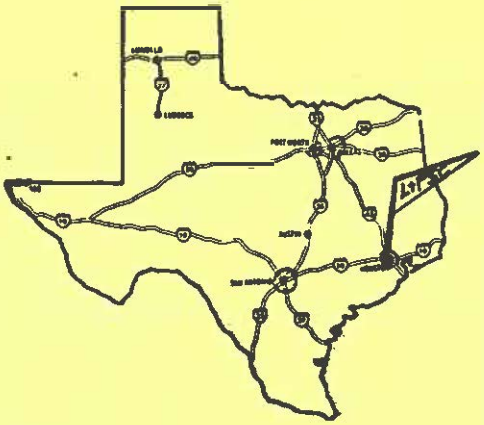
Antarctic Meteorites will be the topic of discussion on Tuesday at 8:30 a.m. (Program, p.10); Galilean Satellites on Tuesday, 1:30 p.m. (Program, p.11); and the Exploration of Venus on Thursday, 1:30 p.m. (Program, p.22)

Public Lecture, Wednesday, March 19, 8:00 p.m., Building 2 Auditorium will feature popular level summaries of the material included in the topical sessions on the Galilean Satellites, Venus, Mars, and the Antarctic Meteorites. There will also be a discussion of the United Nations "Moon Treaty". (Program, p.18)

The Friday morning summary session has been eliminated this year in favor of an extra technical session. Publication of the summaries is scheduled for a summer issue of Geotimes, probably the June issue.

Exhibitors this year will include the American Geological Institute, a Combined Publishers' Exhibit, the Lunar and Planetary Institute, and Pergamon Press. The exhibits will be open during the conference from 8:30 a.m. to 5:00 p.m. in the Gilruth Center.

Advance sets of the Abstract volumes will be mailed to participating PI's and to first authors of independent papers at the end of February. The final sets will be available to registrants at the Conference. Copies will also be available by mail. Since price will be based on cost of mailing plus a small handling charge, the prices will be determined post-conference. For information concerning mail order of Conference Abstracts contact Ms. Carolyn Watkins at the LPI (713)486-2137.



PRELIMINARY PROGRAM INDEX

ELEVENTH LUNAR AND PLANETARY SCIENCE CONFERENCE
PRELIMINARY CONFERENCE PROGRAM

Monday, March 17, 1980

PLANETARY INTERIORS I

Building 2 Auditorium
8:30 a.m.

Chairmen: G. Schubert
K. Goettel

Taylor S. R.
Geochemical constraints on planetary composition: Refractory and moderately volatile elements

Goettel K. A.
Density of the mantle of Mars

Matsui T. Karato S. Yokokura T.
Stress histories retained in olivines from pallasite meteorites

Lazarewicz A. R. Gaffey M. J.
Thermal, stress and mineralogical evolution of small planetary objects

Miyamoto M. Fujii N. Takeda H.
A model of the ordinary chondrite parent body

Harris A. W.
A triaxial figure of Juno inferred from occultation and lightcurve data

Peale S. J. Cassen P. Reynolds R. T.
Tidal dissipation, orbital evolution and the nature of Saturn's inner satellites

Huang W.-L. Williams R. J.
Melting relations of portion of the system Fe-S-Si-O to 32 Kb with implication to the nature of mantle-core boundary

Stevenson D. J.
Core formation dynamics and primordial planetary dynamos

Stevenson D. J. Schubert G. Cassen P.
Reynolds R. T.
Core evolution and magnetism of the terrestrial planets

Torbett M. Smoluchowski R.
The core and the magnetic field of Uranus

Peale S. J. Greenberg R. J.
On the Q of Jupiter

Monday, March 17, 1980

CHARACTERIZATION AND FORMATION OF THE LUNAR CRUST

Gilruth Center - 104
8:30 a.m.

Chairmen: M. Drake
G. McKay

Minear J. W.
The lunar magma ocean, a transient lunar phenomenon?

Hubbard N.
Petrogenesis in a heterogeneous moon

Raedeke L. D. McCallum I. S.
Lunar fractionation trends are not anomalous

Weiblen P. W. Day W. C. Miller J. D.
Significance of major and minor element variations in plagioclase in highlands breccia 67915

Norman M. D. Ryder G.
Geochemical evidence for the role of ilmenite and clinopyroxene in the early lunar differentiation

Warren P. H. Wasson J. T.
Further foraging for pristine nonmare rocks

Steele I. M. Smith J. V.
Ion-probe determination of Li, Na, Mg, Ti, Sr and Ba in lunar plagioclase

Palme H.
The meteoritic contamination of terrestrial and lunar impact melts and the problem of indigenous siderophiles in the lunar highlands

Garrison J. R. Taylor L. A.
Lunar highland breccias: Representative samples of the primitive lunar crust?

Haskin L. A. Korotev R. L. Lindstrom M. M.
Highland olivine norite, a major constituent of lunar highlands soils

Carlson R. W. Lugmair G. W.
78236, a primary, but partially senile, lunar norite

Blanchard D. P. McKay G.
Remnants from the ancient lunar crust II: Norite 15455

Simonds C. H.
Petrologic implications of accretion of large (100 km) slow (8 km/sec) projectiles

Monday, March 17, 1980

CHONDRULES, METEORITIC METALS, AND DEEP SEA SPHERULES

Gilruth Center - 206
8:30 a.m.

Chairmen: J. Wood
J. Morgan

Clayton D. D.
Internal chemical energy: Origin of chondrules

Gooding J. L. Keil K. Fukuoka T. Schmitt R. A.
The origin of chondrules as secondary objects: Evidence from chemical - petrological heterogeneities

Goswami J. N. Macdougall J. D.
Irradiation features in different inclusion types in CM chondrites

Goswami J. N. Lal D. Rao M. N.
Early irradiation history based on studies of carbonaceous chondrites, gas-rich meteorites and terrestrial neon

Rambaldi E. R. Wasson J. T.
Unequilibrated metals and sulfides in the Bishunpur L3 chondrite

Woolum D. S. Burnett D. S. Conca J.
Khohar metals and their different thermal histories

Scott E. R. D. Rajan R. S.
Thermal history of some xenolithic ordinary chondrites

Biswas S. Walsh T. M. Bart G. Lipschutz M. E.
Trace element studies in enstatite meteorites: A study in planetary evolution

Sears D. W. Willis J. Wasson J. T.
Formation of IAB and IIICD iron meteorites

Palma R. L. Heymann D.
Inert gases in fifteen iron meteorites

Fraundorf P.
Stratospheric "Brownlee" particles: Diverse leftovers from the collapse

Brownlee D. E. Bates B. A. Pilachowski L. B.
Olszewski E. Siegmund W. A.
Unmelted cosmic material in deep sea sediments

Nagasawa H. Yamakoshi K. Korotev R. L.
Haskin L. A. Glass B. P.
Trace element concentrations in glassy silicates spherules and microtektites from deep sea sediments

Turkevich A. L. Economou T. E. Blume E.
Szara R.
Cryogenic collection of particles by solid xenon surfaces

Monday, March 17, 1980

ASTEROIDS AND METEORITES

Building 2 Auditorium
1:30 p.m.

Chairmen: D. L. Matson
L. Wilkening

Weidenschilling S. J.
A stochastic model of asteroid rotation

Langevin Y. Maurette M.
A model for small body regolith evolution: The critical parameters

Labotka T. C. Papike J. J.
Regolith of the eucrite parent-body: Petrology of the howardite meteorites

Gaffey M. J.
Mineralogically diagnostic features in the visible and near-infrared reflectance spectra of carbonaceous chondrite assemblages

Wolf R. Ebihara M. Anders E.
Brecciated meteorites as probes of the asteroid belt

McSween H. Y. Lipschutz M. E.
Petrographic comparison of light/dark fractions in the Leighton chondrite

Kothari B. K. Rajan R. S.
Brecciation chronology of xenolithic chondrites using fission tracks

Bunch T. E. Chang S. Ott U.
Regolith origin for Allende meteorite

Dollfus A. Cailleux A. Cerveller B.
Hua C. T. Mandeville J.-C.
Reflectance spectrophotometry of samples extended to UV

Wagner J. K. Cohen A. J. Hapke B. W.
Partlow W. D.
Vacuum ultraviolet reflectance spectra of Group E chondrites and achondrites

Clark P. E.
Theoretical X-ray fluorescence intensities in planetologically significant materials

Monday, March 17, 1980

PLANETARY INTERIORS II

Gilruth Center - 104
1:30 p.m.

Chairmen: R. J. Phillips
A. J. Irving

Korotev R. L. Haskin L. A. Lindstrom M. M.
Identification of a major mafic component in highland soils

Baker M. B. Herzberg C. T.
Spinel cataclasites in 15445 and 72435: Petrography, mineral chemistry, and criteria for equilibrium

Mehta S. Goldstein J. I.
Metallic particles in the glass coating of lunar highland samples 65315, 67435 and 78235

Ryder G. Norman M. D. Score R. A.
Ni, Co content of metal grains for the identification of indigenous rocks

Stolper E.
Mineral assemblages in planetary interiors: Predictions based on estimates of planetary composition

Delano J. W.. Taylor S. R. Ringwood A. E.
Composition and structure of the deep lunar interior

Herbert F.
Time-dependent lunar density models

Buck W. R. Toksoz M. N.
A lunar compositional model based on geophysical and petrologic constraints

Nakamura Y.
Shallow moonquakes: Are they comparable to earthquakes?

Sato M.
Gas fugacities in planetary interiors and their bearing on the origin of metallic cores in the inner planets: (1) Earth

Morgan J. W. Wandless G. A. Petrie R. K.
Irving A. J.
Earth's upper mantle: Volatile element distribution and origin of siderophile element content

Hood L. L. Sonett C. P.
Deep magnetic sounding of the moon in the solar wind: Accounting for plasma diamagnetism

Schock R. N. Duba A. Stocker R. L.
Defect production and electrical conductivity in olivine

Monday, March 17, 1980

MAGNETISM AND TECTONICS

Gilruth Center - 206
1:30 p.m.

Chairmen: L. Srnka
K. Anderson

Collinson D. W.
Magnetization history of lunar samples - can it be explained by conventional processes?

Sugiura N. Strangway D. W.
Thellier paleointensity: Studies on lunar samples

Srnka L. J. Schultz P. H.
A cometary origin of Reiner-gamma magnetic anomalies

Lin R. P. El-Baz F. Hood L. L. Runcorn S. K.
Schultz, P. H.
Magnetic anomalies antipodal to large impact basins

Hood L. L. Wilhelms D. E. Coleman P. J. Jr.
Higher-resolution mapping of lunar nearside magnetic anomalies

Runcorn S. K.
Lunar polar wandering

Gifford A. W. Maxwell T. A.
Ridge systems of Caloris: Comparison with lunar basins

Golombek M. P. McGill G. E.
Origin of lunar grabens and constraints on the total expansion of the moon

Head J. W. Solomon S. C.
Lunar basin structure: Possible influence of variations in lithospheric thickness

Hawke B. R. Head J. W.
Small dark-mantle deposits of possible pyroclastic origin: Geologic setting, composition, and relation to regional stratigraphy

Strain P. L. El-Baz F.
Ina, a lunar caldera?

Greeley R. Womer M.
Mare basin filling: Laboratory simulations

Whitford-Stark J. L. Head J. W.
The stratigraphy of Mare Imbrium

SPECIAL SESSION

Monday, March 17, 1980

APPLICATION OF REMOTE SENSING TECHNIQUES
TO THE STUDY OF THE EARTH

Gilruth Center - 104
8:00 p.m.

Kidd W.
Structural mapping in Tibet using LANDSAT imagery

Kahle A.
Rock type discrimination within the Tintic Mountains, Utah on the basis of thermal infrared measurements

Schaber G.
Radar backscattering investigations in the southwestern U.S.

Elachi C.
Classification of sand dune using radar imaging techniques

Watts A.
Global isostasy studies employing orbital gravity and altimetry data

Langel R.
Large scale variations in the magnetization of the earth's crust

Tuesday, March 18, 1980

PLANETARY INTERIORS III

Building 2 Auditorium
8:30 a.m.

Chairmen: G. Simmons
J. Melosh

Pullan S. Lambeck K.
On constraining lunar mantle temperatures from gravity data

Wasson J. T. Warren P. H.
Contribution of the mantle to the lunar asymmetry

Haines E. L. Metzger A. E.
The dependence of the lunar center-of-mass displacement on crustal thickness and density

VanArsdale W. E. Burns J. A.
Tidal heating of a viscoelastic moon: Comparison to the "elastic" calculation

Ahern J. L. Turcotte D. L.
The effects of magma migration on the evolution of the moon

Chacko S. De Bremaecker J.-Cl.
Finite element model of the thermal evolution of the moon

Janle P.
Structure and evolution of young circular and old irregular maria

Melosh H. J.
Tectonic patterns on reoriented and tidally relaxed planets

Koyama J. Nakamura Y.
Focal mechanism of deep moonquakes

Horvath P. Latham G. V. Nakamura Y. Dorman J.
Structure of the lunar interior based on seismograms corrected for instrumental and near-surface effects

Simmons G. Batzle M. L. Harlow A. L.
Thermal modification of microcracks in lunar rocks and revised estimates for the elastic properties of the shallow moon

Spetzler H. Getting I. C.
The contribution of stress corrosion cracking to Q

Tittmann B. R. Clark V. A. Arora A.
Compressive strength, seismic Q, elastic modulus, and acoustic emission studies of rock

Tuesday, March 18, 1980

PRIMITIVE COMPONENTS IN CARBONACEOUS CHONDRITES

Gilruth Center - 104
8:30 a.m.

Chairmen: S. Chang
P. Buseck

Housley R. M. Clarke D. R.
XPS and STEM studies of Allende acid residues

Frick U. Pepin R. O.
Combustion of an Allende residue: A closed-system study of rare gases released by oxidation

Ott U.
Colloidal separates from an Allende acid residue

Lewis R. S. Matsuda J. Whittaker A.G. Watts E. J. Anders E.
Carbynes: Carriers of primordial noble gases in meteorites

Niemeyer S. Marti K.
"Planetary" noble gases: Rare-gas trapping by laboratory carbon condensates

Mackinnon I. D. R. Buseck P. R.
Structural and textural variations in carbonaceous chondrite matrices

Maloney P. R. Herzberg C. T.
Formation of the C1 carbonaceous chondrite minerals by hydrothermal alteration of interstellar dust grains

Nozette S. Wilkening L. L.
Evidence for hydrothermal alteration in a carbonaceous xenolith from the plainview (H5) chondrite

Srinivasan B. Flynn K. F.
Actinide nuclides: Unsuitable progenitors for Kr and Xe anomalies in carbonaceous chondrites

Crabb J. Lewis R. S. Anders E.
I-Xe ages of carbonaceous chondrites

Rison W. Zaikowski A.
Proportional retention of I and radiogenic 129-Xe in Preheated Allende

Robert F. Becker R. H. Epstein S.
Hydrogen, carbon and nitrogen isotopes in organic extracts and HF-treated residues of the Murchison and Murray meteorites

Kerridge J. F.
Isotopic clues to organic synthesis in the early solar system

Tuesday, March 18, 1980

ANTARCTIC METEORITES

Gilruth Center - 206
8:30 a.m.

Chairmen: K. Keil
D. Bogard

Nishiizumi K. Arnold J. R.
Ages of Antarctic meteorites

Takeda H. Yanai K. Shiraishi K.
Yamato and Allan Hills meteorites and their bearing on the parent bodies

Fireman E. L.
Carbon-14 dating of Antarctic meteorites and Antarctic ice

McKeever S. W. S. Durrani S. A.
Upper limits for the terrestrial ages of the Antarctic meteorites using thermoluminescence

Nagata T.
Magnetic classificaton of Antarctic meteorites

Gibson E. K. Jr.
Carbon abundances in Antarctic meteorites

Schultz L. Palme H. Spettel B. Wanke H. Weber H. W.
Chemistry and noble gases of the unusual stony meteorite ALHA 77081

Simon S. Haggerty S.
Antarctic meteorites: A petrographic and petrologic study of ALHA 77302

McKee T. R. Moore C. B.
Matrix phyllosilicates of the Antarctic C2 chondrite ALHA 77306

Prinz M. Nehru C. E. Delaney J. S. Harlow G. E. Bedell R. L.
ALHA 77219: A new Antarctic mesosiderite and a comparison with other mesosiderites and related achonrites

Agosto W. N. Hewins R. H. Clarke R. S. Jr.
Allan Hills A77219, the first Antarctic mesosiderite

Marvin U. B. Motylewski K.
Mg-carbonates and sulfates on Antarctic meteorites

Cassidy W.
Results of 1979/80 Antarctic meteorite expedition

Tuesday, March 18, 1980

GALILEAN SATELLITES

Buildng 2 Auditorium
1:30 p.m.

Chairmen: T. V. Johnson
S. Peale

Masursky H.
Geology of icy satellites

Soderblom L.
Volcanism on Io

Fanale F. P.
Io - Surface composition and atmosphere

Gradie J. C. Veverka J. Buratti B. J.
The effects of photometric geometry on spectral reflectance

Strom R. G. Terrile R. J. Masursky H.
Hansen C.
Volcanic eruptions on Io

Matson D. L. Ransford G. A. Johnson T. V.
heat flow from Io (J I)

Nash D. 8. Matson D. L.
Periodicity in Io's atmospheric mass: Evidence from post-eclipse brightness

Thurber C. H. Hsui A. T. Toksoz M. N.
Ganymede and Callisto: Thermal evolution models and constraints from Voyager data

Parmentier E. M. Helfenstein P. Head J. W.
Some possible implications of fracturing on Europa

Parmentier E. M. Allison M. L. Cintala M. J. Head J. W.
Viscous degradation of impact craters on icy satellite surfaces

Wednesday, March 19, 1980

PETROGENESIS OF ACHONDRITES AND HIGHLAND ROCKS

Building 2 Auditorium
8:30 a.m.

Chairmen: G. Taylor
J. Wasson

Powell M. A. Walker D. Hays J. F.
Experimental solidification of a eucrite basalt: Microprobe studies

Mittlefehldt D. Drake M. J.
Petrogenesis on the eucrite/diogenite parent body as inferred from modeling cumulate formation

Feierberg M. Drake M. J.
The infrared reflectance spectra of eucrites, shergottites, and Vesta

Hewins R. H.
Subdivision of diogenites into chemical classes

Delano J. W. Arculus R. J.
Nakhla: Oxidation state and other constraints

Watters T. R. Prinz M.
Mt. Egerton and the aubrite parent body

Prinz M. Waggoner D. G. Hamilton P. J.
Winonaites: A primitive achondritic group related to silicate inclusions in IAB irons

Rutherford M. J. Dixon S. Hess P.
Ilmenite saturation at high pressure in KREEP basalts: Origin of KREEP and Hi-TiO2 mare basalts

Marvin U. B. Warren P. H.
A pristine eucritic gabbro from Descartes and its exotic kindred

Cirlin E. H. Housley R. M.
Volatile transfer during lunar metamorphism: (1) Basalt - apatite system

McGee J. J. Nord G. L., Jr. Wandless M.-V.
Comparative thermal histories of matrix from Apollo 17 Boulder 7 fragment-laden melt rocks

Wilhelms D. E. Ulrich G. E. Moore H. J.
Hodges C. A.
Emplacement of Apollo 14 and 16 breccias as primary basin ejecta

James O. 8. McGee J. J.
Petrology of felsite clasts from consortium breccia 73255

James O. B. McGee J. J.
Petrology of ancient mare-type basalt clasts from breccia 73255

Wednesday, March 19, 1980

ORIGIN OF SUN AND PLANETS

Gilruth Center - 104
8:30 a.m.

Chairmen: W. Kaula
L. Grossman

Schramm D. N. Tubbs D. L.
OB associations and protosolar abundances

Heymann D.
Isotopic xenon profiles of a massive star

Fraundorf P. Freeman J. J. Patel R. I. Shirck J.
Walker R. M.
Demonstration of the presence of the "cosmic" 10 um feature in the optical absorption spectrum of "Brownlee" particles

Symbalisty E. M. D. Schramm D. N. Wiita P. J.
Planet and star formation in turbulent collapse

Cameron A. G. W. DeCampli W. M. Bodenheimer P. H.
Numerical experiments with giant gaseous protoplanets embedded in the primitive solar nebula

Fegley B. Jr.
Condensation of barium, strontium, and zirconium in the primitive solar nebula

Trivedi B. M. P. Larimer J. W.
Some new mineral stability relations in cosmic systems

Greenberg R.
Numerical simulation of planet growth: Early runaway growth

Stewart G. R.
Planetesimal acceleration by the transfer of energy from circular orbital motion to random motion

Ward W. R.
Scanning secular resonances: A cosmogonical broom?

Wetherill, G. W.
Could the solar wind have been the source of the high concentration of 36Ar in the atmosphere of Venus?

Binder A. B.
The first few 100 years of evolution of a moon of fission origin

Moroz V. I. Mukhin L. M.
About the initial evolution of atmosphere and climate of the Earth type planets

Wednesday, March 19, 1980

IMPACT CRATERING AND SHOCK METAMORPHISM

Gilruth Center - 206
8:30 a.m.

Chairmen: M. Duke
D. Stoffler

Boslough M. B. Weldon R. J. Ahrens T. J.
Release of water from hydrous minerals due to impact

Lange M. A. Ahrens T. J.
The evolution of an impact generated atmosphere

Cintala M. J. Head J. W. Parmentier E. M.
Impact heating of H2O ice targets: Applications to outer planet satellites

Grieve R. A. F. Palme H. Plant A. G.
Siderophile-rich Fe-Ni particles in the melt rock of E. Clearwater: Their characteristics and possible origin

Horn W. El Goresy A.
The Rochechouart crater in France: Stony and not an iron meteorite?

Reimold W. U. Stoffler D. Stockelmann D.
The mixing process of different target lithologies in the Lappajarvi impact melt

Deamer G. H. Goldstein J. I.
Experimental study of shock melted metallic particles

Horz F. Ostertag R. Rainey D. A. Banholzer G. S.
"Bunte Breccia" of the Ries Crater: Mode, grain size and shock metamorphism of continuous crater deposits

Robertson P. B.
Anomalous development of planar deformation features in shocked quartz of porous lithologies

McSween H. Y. Stoffler D.
Shock metamorphic features in Allan Hills 77005 meteorite

Turner G.
Loss of radiogenic argon from chondrites and estimates of fragmentation temperatures

Schaal R. B. Horz F.
Experimental shock lithification of lunar soil

Gerasimov M. V. Mukhin L. M.
Impact degassing of the Earth

Wednesday, March 19, 1980

PETROGENESIS OF MARE BASALTS

Building 2 Auditorium
1:30 p.m.

Chairmen: J. Hays
A. Bence

Beaty D. W. Albee A. L.
The petrography of basaltic fragments in Apollo 11 drive tubes 10004 and 10005

Grove T. L. Beaty D. W.
Origin of textural diversity in Apollo 11 high-K basalts

Kurat G. Kracher A.
Luna 24: A second case for early magnesian mare fillings

Ma M.-S. Schmitt R. A. Warner R. D. Taylor G. J.
Barker S. Keil K.
Aluminous mare basalts and basaltic-textured KREEPy rocks from Apollo 14 coarse fines

Lofgren G. E. Smith D. P.
The experimental determination of cooling rates of rocks: Some complications

Jovanovic S. Reed G. W., Jr.
Cl, P205, Br and U Partitioning among mineral separates from mare basalt 75055

Nyquist L. E. Wooden J. L. Shih C.-Y. Wiesmann H.
Bansal B. M.
Isotopic and REE studies of 12038: Implications for petrogenesis of aluminous mare basalt

Delano J. W.
Apollo 15 red glass: Chemistry and liquidus phase relations

Hess P. C. Dickinson J. Rutherford M. J.
Solubility of zircon, whitlockite and apatite in lunar basalts and granites

Stier B. Woermann E. El Goresy A.
Subsolidus phase equilibria in the system FeO-MgO-Cr2O3-Al2O3-TiO2

Schreiber H. D. Andrews S. M.
The redox states of uranium in synthetic basaltic magmas

Binder A. B.
On the composition of the mare basalt magma source region

Duba A. Boland J. N.
Iron-Nickel blebs in olivine single crystals are produced by reduction in the solid state

Wednesday, March 19, 1980

MARS I: FIRE, ICE, WATER AND WIND

Gilruth Center - 104
1:30 p.m.

Chairmen: H. Kieffer
P. Schultz

Albee A. L. Evans N. Saunders R. S. Snyder C. W.
Geology of the northern cratered terrain of Mars: Results of the Viking Survey Mission

Arvidson R. E.
Resurfacing history of Mars - crater flux models and thermal history models

Saunders R. S. Roth L. E. Downs G. S.
Schubert G.
Martian tectonism: Evidence from radar altimetry

Solomon S. C. Head J. W.
Tharsis province: Uplift by anomalous mantle, or concentration of tectonism and volcanism in a locally thin lithosphere?

Plescia J. B. Saunders R. S.
Estimates of the thickness of the Tharsis lava flows and their implications for the nature of the origin of the elevation of the Tharsis Plateau

Comer R. P. Solomon S. C. Head J. W.
Thickness of the martian lithosphere beneath volcanic loads: A consideration of time dependent effects

Fink J. H.
Possible rhyolite flows in the Arcadia Planitia region of Mars: evidence from surface ridge geometry

Wenner D. B. Ellwood B. B.
Studies of the formation of subglacially-formed volcanoes in Iceland using paleomagnetic methods

Weldon R. J. Boslough M. B. Ahrens T. J.
Shock-induced color changes in nontronite: A possible martian surface process

Lucchitta B. K.
Martian outflow channels sculptured by glaciers, II

Glicken G. Schultz P. H.
Martian channel erosion: The lahar analogy

Clark B. C.
Aqueous transport of salts on Mars

Williams S. H. Greeley R.
Wind erosion on Mars: An estimate of the rate of abrasion

Wednesday, March 19, 1980

IMPACT CRATERING THEORY AND EXPERIMENTS

Gilruth Center - 206
1:30 p.m.

Chairmen: E. Shoemaker
W. Quaide

Croft S. K.
Cratering flow fields: Implications for excavation cavities, transient cavities, and depth of excavation

Piekutowski A. J.
Formation of bowl-shaped craters

Austin M. G. Thomsen J. M. Ruhl S. F. Orphal D. L. Schultz P. H.
Calculational investigation of impact cratering dynamics: Material motions during the crater growth period

Ruhl S. F. Thomsen J. M.
Impact jetting in plasticene clay: A computational and experimental comparison

Thomsen J. M. Austin M. G. Schultz P. H.
The development of the ejecta plume in a laboratory-scale impact cratering event

Bryan J. B. Burton D. E. Lettis L. A. Jr. Morris L. K. Johnson W. E.
Calculations of impact crater size versus meteorite velocity

Orphal D. L. Borden W. F. Larson S. A. Schultz P. H.
Calculations of impact melt generation and transport

Holsapple K. A.
The equivalent depth of burial for impact cratering

Schmidt R. M.
Meteor Crater - Implications of centrifuge scaling

Roddy D. J.
Calculations of impact cratering mechanics at Meteor Crater, Arizona

O'Keefe J. D. Ahrens T. J.
Cometary impact calculations: Flat floors, multirings and central peaks

Schultz P. H. Srnka L. J. Pai S. I. Menon S.
Cometary collisions on the Moon and Mercury

Schultz P. H.
Ames vertical gun status

Wednesday, March 19, 1980

PUBLIC LECTURE

Building 2 Auditorium
8:00 p.m.

Johnson T. V.
Galilean satellites

Masursky H.
Venus

Arvidson R.
Mars: Where do we stand?

Annexstad J. O.
Hunting for meteorites in Antarctica

Discussion of United Nations' draft agreement governing the activities of States on the moon and other celestial bodies

Thursday, March 20, 1980

CHARACTERISTICS OF MARTIAN SURFACE MATERIALS

Building 2 Auditorium
8:30 a.m.

Chairmen: J. Adams
B. Clark

McCord T. B. Singer R. B. Adams J. B. Hawke B. R.
Head J. W. Huguenin R. L. Pieters C. M. Zisk S. H.
Mouginis-Mark P.
Definition and characterization of Mars global surface units: Preliminary unit maps

Singer R. B.
The dark materials on Mars: II. New mineralogic interpretation from reflectance spectroscopy and petrologic implications

Kieffer H. H. Davis P. A. Soderblom L. A.
Regional correlations of martian remote sensing data

Ditteon R. Kieffer H. H.
Anomalous afternoon cooling on Mars: A preliminary survey of the Viking IRTM diurnal data

Strickland E. L. III
Martian color/albedo units: Viking Lander 1 stratigraphy vs. orbiter color observations

Garvin J. B. Grinspoon D. Head J. W. Helfenstein P.
Lucey P. Mouginis-Mark P. J. Robinson E. A.
Rock morphology and size distributions at the Viking Landing sites and comparisons with Venus

Guinness E. A.
Spectral properties of soils at the Viking 1 Lander site

Evans D. L. Adams J. B. Wenner D. B.
Amorphous gels as possible analogs to martian weathering products

Allen C. C. Gooding J. L. Keil K.
Partially weathered basaltic glass - a martian soil analog

Newsom H. E.
A model for hydrothermal alteration of impact melts on the Earth and Mars

Zisk S. H. Mouginis-Mark P. J.
Confirmation of anomalous areas (oases) on Mars from earth-based radar data

Peterfreund A. R.
Environments of martian wind streaks

Thursday, March 20, 1980

REFRACTORY INCLUSIONS IN CHONDRITES

Gilruth Center - 104
8:30 a.m.

Chairmen: H. Palme
J. Huneke

King T. V. V. King E. A.
Accretionary dark rims in unequilibrated chondrites

Wark D. A. Lovering J. F.
Second thoughts about rims

McMahon B. Haggerty S. E. Bence R.
Experimental studies bearing on magnetite-alloy associations in the Allende meteorite

Simon S. B. Haggerty S. E.
Bulk chemistry of a diverse chondrule suite in the Allende meteorite

Fuchs L. H. Blander M.
Refractory metal particles in refractory inclusions in the Allende meteorite

Boynton W. V. Frazier R. M. Macdougall J. D.
Identification of an ultra-refractory component in the Murchison meteorite

MacPherson G. J. Matthews B. M. Tanaka T. Olsen E.
Grossman L.
Refractory inclusions in Murchison: Recovery and mineralogical description

Tanaka T. Davis A. M. Hutcheon I. D. Matthews M. B.
Olsen E. MacPherson G. J. Grossman L.
Refractory inclusions in Murchison: Chemistry and Mg isotopic composition

Hutcheon I. D. Steele I. M.
Mineralogy and Mg isotopic composition of type B2 inclusions from Leoville and Allende

Wark D. A. Wasserburg G. J.
Anomalous mineral chemistry of Allende FUN inclusions Cl, Ek-141 and EGG 3

Reynolds J. H. Lumpkin G. R. Jeffery P. M.
Search for 129-Xe in mineral grains from Allende inclusions: An exercise in miniaturized rare gas analysis

Herzog G. F. Bence A. E. Bender J. F. Eichhorn G.
Maluski H. Schaeffer O. A.
39-Ar - 40-Ar systematics of Allende inclusions: A laser-microprobe investigation

Mayeda T. K. Clayton R. N.
Oxygen isotopic compositions of some unique meteorites

Thursday, March 20, 1980

ATOMIC PARTICLE INTERACTIONS

Gilruth Center - 206
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Chairmen: T. Tombrello
C. Hohenberg

Spergel M. S. Lazareth O. W. Slatest L. A.
Levy P. W.
Energy averaged neutron cross sections for rock-forming elements at astrophysically interesting temperatures

Lapides J. R. Spergel M. S. Lazareth O. W.
Levy P. W. Reedy R. C. Trombka J. I.
The effects of hydrogen on gamma-ray emission from planetary surfaces

Nautiyal C. M. Padia J. T. Rao M. N. Venkatesan T. R.
Characterization of solar and galactic cosmic ray produced noble gas components in lunar soils and rocks

Yaniv A. Marti K. Reedy R. C.
The solar cosmic-ray flux during the last two million years

Thiemens M. H. Clayton R. N.
Solar and cosmogenic nitrogen in the Apollo 17 deep drill core

Eugster O. Grogler N. Eberhardt P. Geiss J.
Noble gases trapped 3.7 AE ago in orange and black glasses from drive tubes 74001/2

Bernatowicz T. J. Hohenberg C. M. Hudson G. B.
Kennedy B. M. Podosek F. A.
Parentless lunar radionuclear components: Acquisition and siting in 14301

Hodges R. R.
The influence of polar cold traps on lunar exospheric Argon-40

Wieler R. Poupeau G. Signer P.
Solar noble gas saturation in lunar regolith minerals: Does it occur?

Hudson B. Flynn G. J. Fraundorf P. Hohenberg C. M.
Shirck J.
Rare gases in stratospheric "Brownlee" particles: Proof of extraterrestrial origin

Jull A. J. T. Grant W. A. Christodoulides C.
Pillinger C. T.
Experimental ranges of the solar wind ions krypton and xenon in minerals

Smoluchowski R.
Erosion of particles in planetary rings and interplanetary space

Seiberling L. E. Griffith J. E. Tombrello T. A.
Enhanced sputtering of dielectric materials and its relationship to track registration

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EXPLORATION OF VENUS

Building 2 Auditorium
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Chairmen: R. Arvidson
M. Malin

Report on the current status of VOIR

Hunten D. M.
Atmospheric origin and evolution: The evidence from Venus

Russell C. T. Elphic R. C. Luhmann J. G. Slavin J. A.
On the search for an intrinsic magnetic field at Venus

Pettengill G. H. Ford P. G. Loriot G. B. Masursky H.
Eliason E.
Venus topography and meter-scale surface roughness as seen by the Pioneer orbiter radar

Masursky H. Eliason E. Ford P. G. McGill G. E.
Pettengill G. H. Schaber G. G. Schubert G.
Pioneer Venus radar results: Geomorphology from imaging and altimetry

Phillips R. Kaula W. Schubert G. Masursky H.
Venus tectonics: Crust and interior

Sjogren W. L. Birkeland P. W. Phillips R. J. Wimberly R. N.
Venus gravity anomalies

Jurgens R. F. Goldstein R. M. Zygielbaum A. I.
Three-station maps of Venus: The 1978 inferior conjunction

Campbell D. Burns B. A.
Earth-based radar imagery of Venus

Greeley R. Iversen J. Leach R. Pollack J.
Venus: Consideration of aeolian (windblown) processes

Dunham D. Spetzler H.
Reconciling venusian topography and the Ar-40 anomaly

Toksoz M. N. Arkani-Hamed J. Hsui A. T.
Evolution of Venus

Kaula W. M.
The tectonic difference of Venus from the Earth

Watson C. C. Haff P. K. Tombrello T. A.
Solar wind sputtering effect on Mars and Venus

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PLANETARY IMPACT CRATERING, MORPHOLOGY, AND PROCESSES

Building 2 Auditorium
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Chairmen: R. Schaal
J. Head

Passey Q. R.
Effects of atmospheric breakup on crater field formation

Woronow A. Mutch P.
On the origin of martian pedestal, lobate, and multilobate ejecta deposits

Mouginis-Mark P. J.
Why are there different ejecta morphologies for martian impact craters?

Singer J. Schultz P. H.
Secondary impact craters around lunar, mercurian, and martian craters

Hodges C. A. Shew N. B. Clow G.
Distribution of central pit craters on Mars

Wood C. A.
New observations of martian basins

Pike R. J.
Terrain dependence of crater morphology on Mars: Both yes and no

Bianchi R. Fulchignoni M. Evangelista S.
Planetary cratering: Rates of modification of lunar crater morphologies

De Hon R. A.
Variations in crater morphology: 15-20 km diameter

Hale W. S. Head J. W.
Central peaks in mercurian craters: Comparisons to the moon

McKinnon W. B. Melosh H. J.
Multi-ringed basins in the solar system: A "new" paradigm

Schultz P. H. Gault D. E. Mendenhall M.
Multiple-body impacts: Implications for secondary impact proceses

Friday, March 21, 1980

ISOTOPIC ANOMALIES

Gilruth Center - 104
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Chairmen: J. H. Reynolds
W. Boynton

Sabu D. D. Manuel O. K.
The neon alphabet game

Meier F. O. Jungck M. H. A. Eberhardt P.
Evidence for pure neon-22 in Orgueil and Murchison

Niederer F. R. Papanastassiou D. A. Wasserburg G. J.
Titanium abundances in terrestrial, lunar and meteoritic samples

Thiemens M. H. Clayton R. N.
Nitrogen isotopes in the Allende meteorite

Lee T. Mayeda T. K. Clayton R. N.
The oxygen isotopic composition in Allende inclusion HAL and the origin of the FUN anomalies

Epstein S.
The delta 18-O and delta 17-O values in reactions involving excited oxygen molecules by measuring CO2 mass spectrometrically

Arrhenius G. Corrigan M. J. Fitzgerald R. W.
Excitation of 12-C 16-O by hydrogen Lyman alpha radiation: potential Cause of selective 16-O fractionation in protostellar clouds

Chen J. H. Wasserburg G. J.
The isotopic composition of U in meteorites and lunar samples

Tatsumoto M. Shimamura T. Patchett P. J. White W. M.
Age of the galaxy: Isotopic composition of U, Sr, Sm, and Nd in Allende meteorite

Tatsumoto M. Shimamura T. Manual O.K. Unruh D. M. Pellas P.
Cm-U and Pu-Xe chronology of meteoritic whitlockite: Confirmation of live 247-Cm in early solar system

Stapanian M. T. Burnett D. S. Furst M. J.
Meteorite actinide chemistry: Th-U microdistributions

Jones J. H. Benjamin T. M. Heuser R. Burnett D. S.
Meteoritic actinide chemistry: Laboratory partitioning studies

Esat T. M. Papanastassiou D. A. Wasserburg G. J.
The initial state of 26-Al and 26-Mg/24-Mg in the early solar system

Patchett P. J.
Isotopic fractionation during accretion of Allende: Sr double-spike data from olivine chondrules

Kaiser T. Kelly W. R. Wasserburg G. J.
Isotopically anomalous Ag in two iron meteorites

Friday, March 21, 1980

REGOLITH CHARACTERISTICS AND MATURATION

Gilruth Center - 206
8:30 a.m.

Chairmen: D. McKay
C. Pieters

Labotka T. C. Kempa M. J. White C. Papike J. J.
The lunar regolith: Comparative petrology of the sampling sites

Laul J. C. Lepel E. A.
The lunar regoliths "comparative chemistry of the sampling sites"

Basu A. McKay D. Nace G.
Lunar core 15010

Bogard D. D. Morris R. V. Hirsch W. C. Lauer H. V. Jr.
Depositional and irradiational history of 15010-15011 core soils: Noble gases and FMR

Blanford G. E.
Track production below reworking zones

Blanford G. E. Blanford J. Hawkins J. A.
Particle tracks in lunar core 15010

Basu A. McKay D. S.
Mineralogical maturation of terrestrial and lunar sediments: Preliminary report of a comparative study

Woodcock M. R. Fallick A. E. Pillinger C. T.
Formation of acid hydrolysable carbon and superparamagnetic iron during agglutination?

Fallick A. E. Pillinger C. T. Stephenson A.
On the behaviour of disseminated iron droplets during regolith maturation

Sorensen J. Wegmuller F. Krahenbuhl U.
von Gunten H. R.
Volatilities of trace elements in minerals and agglutinates of sample 75080 investigated by heating experiments

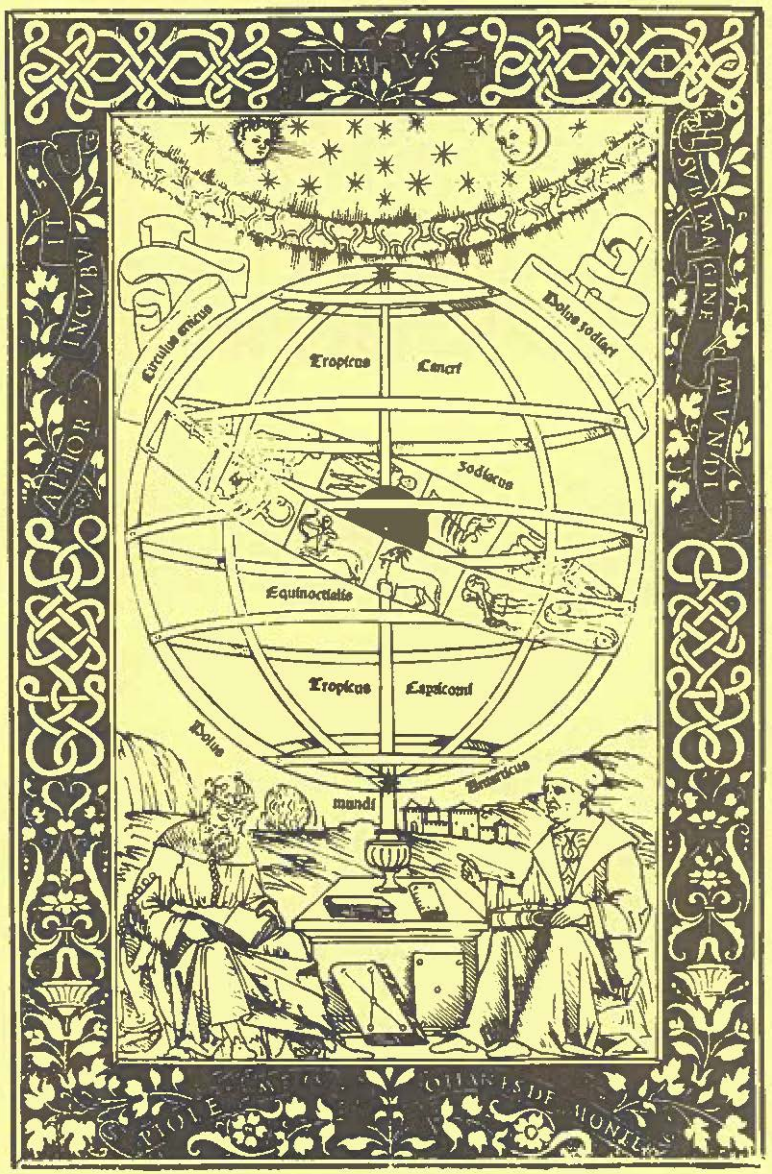
Allison R. J. McDonnell J. A. M.
Microscale accretionary particles and impact pits on Luna 24 core spherules: SEM observations extended

Farr T. G. Bates B. Ralph R. Adams J. B.
Effects of overlapping optical absorption bands of pyroxene and glass on the reflectance spectra of lunar soils

Pieters C. M. Waltz S. Butler P. Hawke B. R.
Lunar core multispectral imaging experiment: First results

Fruchter J. S. Evans J. C. Reeves J. H. Perkins R. W.
Depositional history of the Apollo drive tube 76001 during the past few million years

Nishiizumi K. Murrell M. T. Arnold J. R. Imamura M.
53-Mn measurements in individual rocklets from 60010 and in lunar core 70009



Photograph courtesy of the Dibner Library, Smithsonian Institution

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Poster Exhibits will be displayed at the Gilruth Center

Andre C. G. Adler I.
High-resolution X-ray data from the lunar nearside/farside chemical transition zone

Beaty D. W. Albee A. L.
The petrology of a pyroxenite xenolith in mare basalt 10050

Clanton U. S. Zook H. A. Schultz R. A.
Micrometeorite and aluminum oxide spherule hypervelocity impacts on Skylab IV windows

Cranmer D. Salomaa R. Yinnon H. Uhlmann D. R.
Nucleation barrier in anorthite

Hapke B. Christman C. Rava B. Mosher J.
A color-ratio map of Mercury

Helfenstein P. Mouginis-Mark P. J.
Morphology and distribution of fractured terrain on Mars

Horvath P. Latham G. V. Nakamura Y. Dorman J.
Structure of the lunar interior based on seismograms corrected for instrumental and near-surface effects

Johnson P. H. Score R. M Schwarz C. M. Mason B.
Display of some unusual meteorites from Antarctica

McCord T. B. Singer R. B. Adams J. B. Hawke B. R.
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Mouginis-Mark P.
Definition and characterization of Mars global surface units: preliminary unit maps

Mouginis-Mark P. J. Zisk S. H.
Radar analysis of surface materials in the Memnonia region of Mars

Nagle J. S.
Preliminary description and interpretation of drive tube 12027

Nakamura Y.
Shallow moonquakes: Are they comparable to earthquakes?

Pieters C. M. Flam S. McCord T. B.
Near-infrared lunar spectra: Patterns in the increasing data set

Pinson W. H. Jr.
Theory of origin of circular ring features in the James Bay lowlands and southwestern Baffin Island

Roddy D. J. Watson R. D.
Measurements of shock-induced luminescence at Meteor Crater, Arizona, by an airborne Fraunhofer line discriminator system

Schonfeld E.
Improved spatial resolution and contrast of orbital geochemical experiments

Trombka J. I. Crannell C. J. Andre C. Delsemme A.
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Remote X-ray sensing methods for planetary exploration

Uhlmann D. R. Yinnon H. Cranmer D.
Crystallization behavior of albite

Yinnon H. Uhlmann D. R.
On the barrier to crystal nucleation in lunar glasses

ASTRONOMY DAY 1980

April 26, 1980 will be national Astronomy Day. The date was picked by the Astronomical Association of Northern California so events in all parts of the country would have a better chance of good weather than earlier in spring, while sunset would still be conveniently early. Daylight time will go into effect the following day. The moon will be just past first quarter. Northern California clubs interested in participating in this observance should contact AANC president Don Warren, City College of San Francisco, 50 Phelan Ave., San Francisco, CA 94112. Other groups are invited to write the Astronomical League's coordinator, Ms. Irene Sacks, Morris Museum, Box 125, Convent Station, NJ 07951. A substantial prize for the project accomplishing the most to popularize astronomy will be awarded by Edmund Scientific Co.

IAU COLLOQUIUM ON REFERENCE COORDINATE SYSTEMS FOR EARTH DYNAMICS

The Second IAU Colloquium (no. 56) on Reference Coordinate Systems for Earth Dynamics will be held at the Copernicus Astronomical Centre, Warsaw, Poland, September 8-12, 1980. The Colloquium will be organized by the Space Research Centre of the Polish Academy of Sciences and the Smithsonian Institution Astrophysical Observatory to review the progress made in requirements, definitions, and practical realization of reference coordinate systems used in geodynamics, space research, and astronomy since the first IAU Colloquium (no. 26) held in Torun, Poland, in 1974. It is expected that publication of the Proceedings of the Colloquium will be handled by D. Reidel Publishing Co.

The Colloquium will include, besides the plenary meeting, the following Working Groups: (1) Requirements for Reference Coordinate Systems for Earth Dynamics; (2) Conceptual Definition of Reference Coordinate Systems for Earth Dynamics; (3) Practical Realization of Reference Coordinate Systems.

Individuals interested in participating in the Colloquium, or requiring further information, should write directly to one of the convenors:

Dr. B. Kołaczek
Space Research Centre
Polish Academy of Sciences
Bartycka 18
00-716 Warszawa
Poland
TELEX: 815670

Dr. E.M. Gaposchkin
Smithsonian Astrophysical Observatory
60 Garden Street
Cambridge, MA 02128 USA
TELEX: 921428
Cable: SATELLITES NEW YORK

IGC UPDATE

The 26th International Geological Congress will be held in Paris, July 7-17, 1980. A listing of the maps, guide-books, and other publications scheduled for this Congress can be found in Episodes vol. 1979, No. 4, p. 30. All inquiries pertaining to the 26th IGC should be sent to:

Secretariat du XXVI CGI
77-79 rue Claude-Bernard
F-75005 Paris, France

COSPAR TOPICAL MEETING "OBSERVATIONS OF THE PLANETS FROM EARTH-ORBITING VEHICLES"

Telescopic observations of the planets have been made from the surface of the Earth for three hundred seventy years. Within the past two decades, deep-space exploration missions have given new insights for detailed planetary studies. A third class of observations, from semi-permanent Earth-orbiting satellites, bridges the gap between the other two in several ways. Such observations can exploit much wider spectral bands and superior spatial resolution than ground-based ones can; and they provide better opportunities for long time-baseline studies of particular planets and comparative studies between planets than many deep-space missions do.

This meeting will review previous and present space results, and will describe prospects for future work. Both observational and theoretical work will be discussed. Space observations of the global properties of the earth are appropriate in this meeting. However, it is preferred that those reports which feature spatial resolution of the Earth that is much higher than Earth-orbiting vehicles can achieve for other planets be given at other meetings.

The meeting will be held in Budapest, Hungary, during the week of June 9-14, 1980. Its duration will be three half-day sessions, with both invited and contributed papers. For more information contact the meeting organizer: Dr. John Caldwell, E.S.S. Dept., S.U.N.Y. at Stony Brook, New York, NY 11794.

SPACE GEODESY AND ITS APPLICATIONS

The Centre National d'Etudes Spatiales, in cooperation with the Institut Geographique National, as part of the activities of the Groupe de Recherches de Geodesie Spatiale, is organizing an international symposium on "Space Geodesy and Its Applications," to be held in Cannes, France, November 18-21, 1980.

The main purpose of the symposium is to bring together research workers involved in various disciplines that use space geodesy techniques (VLBI on extragalactic sources included) and scientists specializing in such techniques.

The preliminary program will focus on research advances in space geodesy in such areas as techniques and instrumentation, gravity field modeling, combination of multisource (satellite and terrestrial) data, and positioning.

The rest of the symposium will deal primarily with dynamics of the solid earth, tides and earth's rotation, tectonic movements, earthquakes, studies of the atmosphere, oceans and ice sheets, contributions to climatic studies, planetary physics, fundamental physics, time determination, and relativity.

Proposals for papers should be sent before April 15, 1980 to Centre National d'Etudes Spatiales, Departement des Affaires Universitaires, 18 Avenue Edouard-Belin, 31055 Toulouse Cedex FRANCE. (Telephone: 61-53.11.12, ext. 50.12; Telex: 531 081)

SUMMER INTERN PROGRAM FOR UNDERGRADUATES

The Lunar and Planetary Institute offers selected undergraduates an opportunity to participate actively in lunar and planetary research with scientists at the Institute and at the NASA Johnson Space Center. The ten-week program begins June 2 and ends August 8, 1980, although these dates can be adjusted somewhat to fit individual schedules. The weekly stipend will be $124, plus $70/week living expenses, and assistance with travel costs.

Areas of Research Interests include: Magnetism, thermal models of planetary bodies, thermal models of magmas, analysis of basalts, ion microprobe analysis, planetary regolith studies, experimental petrology, sedimentary petrology, scanning electron microscope studies, planetary photogeology, remote sensing of planetary surfaces, applied math, computer applications, space industrialization, and special library science. Such studies are part of current research at the LPI and JSC with direct applications to problems concerning the formation and evolution of solid bodies in the Solar System. Each project will be coordinated by an LPI or JSC scientist.

Eligibility and Selection Criteria: Undergraduates, including class of 1980 graduates, are eligible and will be considered for appointment without regard for race, creed, color, sex, national origin, age, handicap status or other non-merit factors. Selection is based upon the following criteria: (1) Scholarship, (2) career objectives and scientific interests, and (3) match of interests of applicant with available research projects. Notification of selection will be made by April 15, 1980.

APPLICATION DEADLINE IS MARCH 15, 1980: Please send a brief biographical sketch, a description of academic goals, career plans and scientific interests, and a summary of why you wish to participate in the intern program. In addition, arrange for the sending of official transcripts and three letters of recommendation covering academic achievement, career potential and character. For an application form or more information contact: SUMMER INTERN PROGRAM, The Lunar and Planetary Institute, 3303 NASA Road One, Houston, TX 77058, Mrs. Pam Jones, (713)486-2150.

CALL FOR PAPERS

The American Geophysical Union 1980 Spring Meeting will be held jointly with the Canadian Geophysical Union, the Canadian Meteorological and Oceanographic Society, the Division of Aeronomy and Space Physics of the Canadian Society of Physics, and the Canadian Exploration Geophysical Society in Toronto, May 22-27, 1980. Contributed papers in all areas of geophysics explored by the various societies are solicited. Abstracts must be submitted to AGU, 2000 Florida Avenue NW, Washington, D.C. 20009 by Saturday, March 1, 1980. For additional information on the meeting and the directions for preparing abstracts see EOS vol. 60, no. 50, December 11, 1979, pp. 1031-1033.

The Geological Society of America 1980 annual meeting will be in Atlanta, Georgia, November 17-20, 1980. Headquarters and employment service will be at the Atlanta Marriott. Technical sessions and exhibits will be at the Georgia World Congress Center. Information and abstract forms available from Abstracts Coordinator, GSA, P.O. Box 9140, Boulder, CO 80301 (303)447-2020. Deadline for abstracts, June 13, 1980.

C A L E N D A R

February 27-29	3rd Annual Conference on the Physics of the Jovian Magnetosphere, Rice University, Houston, TX. Contact: T.W. Hill Dept. of Space Physics & Astronomy Rice University Houston, TX 77001
March 1	Abstract Deadline for American Geophysical Union Spring Meeting, Toronto, Canada See page 25 this Bulletin
March 17-21	XI LUNAR & PLANETARY SCIENCE CONFERENCE Houston, TX Contact: Symposia Office Lunar and Planetary Institute
April 21	DEADLINE for Submission of Papers to the 11th PROCEEDINGS
April 22-25	1980 Satellite Power Systems, Program Review and Symposium Lincoln, Nebraska Contact: David L. Christensen Johnson Environmental & Energy Center University of Alabama P. O. Box 1247 Huntsville, AL 35807 Phone: (205) 895-6257
May 22-27	AGU Spring Meeting, Toronto Contact: AGU 2000 Florida Avenue NW Washington, DC 20009 See page 25 this Bulletin
June 13	Abstract Deadline for Geological Society of America Annual Meeting, Atlanta, Georgia See page 25 this Bulletin
June 9-14	COSPAR Topical Meeting 'Observations of the Planets from Earth-Orbiting Vehicles' Budapest, Hungary. see page 24 this Bulletin

September 8-12	IAU Colloquium on Reference Coordinate Systems for Earth Dynamics, Warsaw, Poland See page 23 this Bulletin
November 17-20	Geological Society of America Annual Meeting, Atlanta, Georgia Contact: GSA P.O. Box 9140 Boulder, CO 80301 See page 25 this Bulletin

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NOTE TO OUR READERS:

Some regular features of the Bulletin such as the Current Bibliography of Lunar and Planetary Literature and reviews of new publications are omitted from this issue because of the Preliminary Program of the 11th Lunar and Planetary Science Conference. They will be resumed in the next issue to be published in May 1980.

The Editor

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The lunar and planetary information bulletin is published by the Lunar and Planetary Institute. There are usually four issues per year. It is distributed free on request to lunar and planetary scientists, educators, students, and their institutions.

The next issue will be in May. Copy deadline 1 May 1980. If you have any announcements which you would like to have printed in the bulletin, please send them to the Editor. We reserve the right to select and edit copy.

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