lunar AND planetary information bulletin

USRA

NUMBER 18 FEBRUARY 1979

IT'S THE TENTH!!! ***MARCH 19-23,1979***

The TENTH LUNAR AND PLANETARY SCIENCE CONFERENCE will begin Sunday, March 18 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 JSC Building 2 Auditorium.

From a total of 493 abstracts accepted for publication in *LUNAR AND PLANETARY SCIENCE X*, the Program Committee has constructed twenty sessions for a total of 261 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.

A PRELIMINARY conference program included with this bulletin is arranged so that the sessions on a particular topic are together.

In addition to these sessions, an afternoon session commemorating the Tenth Anniversary of Apollo 11 is scheduled for Wednesday. Three special topical sessions are planned: "Future Lunar Exploration"(Monday evening); "The Earth from Space" (Tuesday evening); and "Reports on Voyager and Pioneer" (Thursday evening). Meetings on the use of the NASA/Ames Vertical Gun Facility are also planned.

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. The sets can be obtained by sending a pre-paid order ($1.00 U.S. mailing, $6.00 foreign) to Ms. Carolyn Watkins at the LPI. Orders will be filled after the Conference for as long as the supply lasts.

****OTHER CONFERENCE INFORMATION----page 2---program--page 3-13---hotels--page 14****

SPECIAL SESSIONS - TENTH CONFERENCE

FUTURE LUNAR EXPLORATION

March 19 - Monday evening
Room 104 Gilruth Center

CHAIRMEN: Prof. J. Arnold, UC-San Diego
Dr. D. R. Criswell, LPI

Contributions for this special session are requested describing lunar science experiments which should be done in the event of a return to the Moon of manned and unmanned equipment. Assume the existence of at least one permanent lunar base and the possibility of extensive sample returns to earth. Contact Dr. David Criswell, LPI, at 713/486-2152 for additional information. To obtain abstract forms for this session, please call Ms. Thanny Morrison, LPI at 713/486-2156.

EARTH FROM SPACE

March 20 - Tuesday evening
Building 2 Auditorium

CHAIRMEN: Dr. E. A. Flinn, NASA/Headquarters
Dr. L. Silver, Cal-Tech

This session will consist of invited papers covering many aspects of earth science. The intent is to give the attendees a global view of the Earth as a planet. Some topics to be covered include tectonics and climatology. Dr. Tony England, USGS-Reston, will present the introduction and overview.

REPORTS ON VOYAGER AND PIONEER

March 22 - Thursday evening
Room 104 Gilruth Center

CHAIRMAN: Dr. W. Quaide, NASA/Headquarters

This session will be divided into three parts: the results from the Voyager encounter with Jupiter and its satellites; the results from the Pioneer encounter with Venus; and a review of the Venus Orbiting Imagery Radar Program (VOIR). Mission descriptions and discussions of the atmospheric data and the surface data of the solid bodies and satellites will be included in this session. A spectacular 3-D movie of Mars based on Viking photos developed by Elliott Levinthal (Stanford U) will precede this session.

AMES GUN/STEERING COMMITTEE AND POTENTIAL USERS

It is anticipated that there will be two meetings concerning the Vertical Ballistic Gun at NASA Ames during the Tenth L&PSC: 1) Steering Committee meeting early in the week, and 2) a general information briefing by the Steering Committee and Ames staff on the status and plans for the Facility. This briefing probably will follow one of the cratering sessions. Specifics will be available at registration.

At this time it looks like the Gun will be operational before summer 1979. Potential users, including those who have not been involved previously, can get information from Dr. Peter Schultz, LPI, the Science Coordinator (713/486-2174).

Monday, March 19, 1979

I-A COMPOSITIONS OF PLANETARY INTERIORS

Building 2 Auditorium

8:30 a.m.

CHAIRMEN: M. Drake
L. Silver

Delano, J. W. Ringwood, A. E.
'Pristine' Highland Rocks: A Critical Evaluation

Wanke, H. Dreibus, G. Palme, H.
Non-Meteoritic Siderophile Elements in Lunar Highland Rocks: Evidence from Pristine Rocks

Wolf, R. Woodrow, A. Anders, E.
Siderophile and Volatile Elements in the Earth and Moon: Similar or Not?

Taylor, S. R.
Relative Refractory and Volatile Element Contents of the Earth and the Moon

Warren, P. H.
The Quest for Pristine Nonmare Rocks: A New Crop of Toisons d'Or

Newsom, H. E. Drake, M. J.
Metal Depletion in the Eucrites: Evidence for a Core or for a Heterogeneous Mantle in the Eucrite Parent Body

Morgan, J. W. Wandless, G. A.
Terrestrial Upper Mantle: Siderophile and Volatile Trace Element Abundances

Delaney, J. S. Hervig, R. L. Smith, J. V.
Dawson, J. B. Nixon, P. H.
Petrologic Heterogeneity in the Upper Mantle of the Earth: Barren and Fertile Harzburgites: Mantle Section at Malaita, Solomon Islands: Implications for Venus and Mars

O'Nions, R. K. Evensen, N. M. Hamilton, P. J.
Chemical Constraints on the Evolution of the Earth's Crust and Mantle

Warren, P. H. Wasson, J. T.
Effects of Pressure on the Crystallization of a Moon-Sized "Chondritic" Magma Ocean

Eggler, D. H.
Studies on the Role of CO2 and CO in Magma Genesis in Planetary Interiors

Binder, A. B.
Devolatilization Mechanism for a Moon of Fission Origin

Jakosky, B. M. Ahrens, T. J.
The History of an Atmosphere of Impact Origin

Monday, March 19, 1979

I-B MAGNETISM

Building 2 Auditorium

1:30 p.m.

CHAIRMEN: M. Fuller
P. Coleman

Russell, C. T. Elphic, R. C. Slavin, J. A.
Initial Pioneer Venus Magnetometer Observations

Levy, E. H.
Dynamo Amplification of Ambient Magnetic Fields

Srnka, L. J. Mendenhall, M. H.
Models of an Early Lunar Dynamo

Dyal, P. Vanyan, L. L. Daily, W. D.
Mare Serenitatis Conductivity Anomaly Detected by Apollo 16 and Lunokhod 2 Magnetometers

Nagata, T.
Magnetic Properties and Paleointensity of Achondrites in Comparison with Those of Lunar Surface Rocks

Sugiura, N. Wu, Y. M. Strangway, D. W.
Pearce, G. W. Taylor, L. A.
Paleointensity Studies on 70019, A Young Glass Sample from Apollo 17

Fuller, M. Meshkov, E. Cisowski, S. M.
The NRM of Certain Mare Basalts and the Intensity of the Fields in Which NRM was Acquired

Lin, R. P.
Observations of Regions of Strong Surface Magnetic Field in the Lunar Mare

Hood, L. L. Coleman, P. J., Jr. Wilhelms, D. E.
A Study of Lunar Nearside Magnetic Anomalies

Sonett, C. P. Wiskerchen, M. J. Herbert, F.
The High Frequency Electromagnetic Response of the Moon and the Shallow Bulk Electrical Conductivity

Levin, B. J.
On the Core of the Moon

Runcorn, S. K.
An Iron Core in the Moon Generating an Early Magnetic Field?

Goldstein, B. E. Suess, S. T.
Mercury: Supply and Loss Rates of Atmospheric He

Thursday, March 22, 1979

I-C PLANETARY INTERIORS

Gilruth Center - 104

1:30 p.m.

CHAIRMEN: D. Turcotte
G. Latham

Warner, J. L.
A Model for the Lithosphere of Venus

Goins, N. R. Toksoz, M. N. Dainty, A. M.
The Lunar Interior: A Summary Report

Nakamura, Y. Latham, G. V. Dorman, H. J.
Ibrahim, A. K. Koyama, J. Horvath, P.
Shallow Moonquakes: Depth, Distribution and Implications as to the Present State of the Lunar Interior

Duba, A. Dennison, M. Irving, A. J. Thornber, C. R.
Huebner, J. S.
Electrical Conductivity of Aluminous Orthopyroxene

Ransford, G. A. Kaula, W. M.
A Comparison of Accretional Heating Models

Binder, A. B. Lange, M. A.
Critical Review of the Limits for the Thermally Induced Radius Changes of the Moon and Mercury

Minear, J. W. Clow, G. Fletcher, C. R.
Thermal Models of Asteroids

Cassen, P. Reynolds, R. T. Peale, S. J.
Runaway Tidal Heating of Io

Parmentier, E. M. Head, J. W.
Endogenic Processes on Low-Density Satellites: Ganymede and Callisto

Verrall, R. A. O'Connell, R. J.
Creep and Fracture in the Moon

Schubert, G. Cassen, P.
Concentration of Radioactive Heat Sources in the Moon

Turcotte, D. L.
Parameterized Convection Within the Moon and the Terrestrial Planets

Chacko, S. De Bremaecker, J.-Cl.
A Thermal Evolution Model for the Moon

Tuesday, March 20, 1979

II-A REMOTE SENSING OF THE MOON AND PLANETS

Building 2 Auditorium

8:30 a.m.

CHAIRMEN: C. Pieters
R. Reedy

Bielefeld, M. J.
Classification of the Lunar Surface Using Orbital Altimetry, Geochemistry and Geology Data

Davis, P. A. Arnold, J. R.
Iron and Titanium Distribution on the Lunar Surface as Determined by Matrix Inversion of Gamma-ray Orbital Data

Metzger, A. E. Johnson, T. V. Matson, D. L.
Arnold, J. R.
A Comparison of Mare Surface Chemistry Obtained by Spectral Reflectance and Gamma-ray Spectroscopy

Hubbard, N.
The Diverse Al Concentrations of Mare Basalts

Dollfus, A. Cailleux, A. Hua, C. T.
Remote Sensing of TiO_2 on Planets and Satellites

McCord, T. B. Clark, R. N. McFadden, L. A.
Pieters, C.
Newly Defined Ir Electronic Absorption Features in Telescopic Reflectance Spectra: The Lunar Case

Davies, D. Johnson, T. V. Matson, D. L.
Lunar Multispectral Imaging at 2.25um: A New Technique and First Results

Wagner, J. K. Cohen, A. J. Hapke, B. W.
Partlow, W. D.
Vacuum Ultraviolet Reflectance Spectra of Group H Chondrites

Nolet, D. A. Burns, R. G. Flamm, S. L.
Besancon, J. R.
Spectra of Heated Fe-Ti Silicate Glasses: Implications to Remote Sensing Measurements of Planetary Surfaces

Adams, J. B. Horz, F. Gibbons, R. V.
Effects of Shock-loading on the Reflectance Spectra of Plagioclase, Pyroxene, and Glass

McCord, T. B. Clark, R. N.
The Mercury Soil: Presence of Fe^{2+}

Leake, M. A.
The Intercrater Plains of Mercury

Tuesday, March 20, 1979

II-B LUNAR AND PLANETARY REGOLITHS

Gilruth Center - 104

1:30 p.m.

CHAIRMEN: D. Heymann
D. Woolam

Hodges, R. R., Jr.
Effects of Orbit Recession of the Moon on the Escape of Materials from the Lunar Surface

Graham, D. G. Muenow, D. W. Gibson, E. K., Jr.
Adsorption of CO and N2 by Samples with Large Surface Area

Jovanovic, S. Reed, G. W., Jr.
Lunar Regolith Evolution: A Low-Temperature Volatile Element Perspective

Housen, K. R. Greenberg, R. Chapman, C. R.
Wilkening, L. L.
A Comparison of Regolith Evolution on Asteroids and the Moon

Goswami, J. N. Lal, D.
A Scenario for the Formation of the Carbonaceous Chondrites Based on Cosmogenic Clues

Dran, J. C. Duraud, J. P. Langevin, Y.
Maurette, M.
The Predicted Irradiation Record of Asteroidal Regoliths and the Origin of Gas-rich Meteorites

Blanford, G. E. Hawkins, J. A.
Irradiation Stratigraphy in Double Drive Tube 60009/10

Etique, Ph. Funk, H. Horn, P. Signer, P.
Implications of an In-depth Study of Light Noble Gases in Plagioclases of the Highland Soil 61501

Basu, A. McKay, D. S.
Apollo 15 Soil Petrographic Provinces and the Plagioclase-rich Paleosol

Ivanov, A. V. Gorshkov, E. S.
Luna 24 Regolith Core: Magnetic Susceptibility as a Stratigraphy Indicator

Mehta, S. Goldstein, J. I.
Analytical Electron Microscopy Study of Submicroscopic Metal Particles in Glassy Constituents of 15015 and 60095 Lunar Breccias

Batzle, M. L. Simmons, G.
Effects of Diurnal Temperature Variations on Lunar Rocks

Wednesday, March 21, 1979

II-C LUNAR SOILS AND THE APOLLO-17 CORE

Gilruth Center - 206

8:30 a.m.

CHAIRMEN: K. Keil
E. Gibson

Labotka, T. C. Vaniman, D. T. Papike, J. J.
Simon, S.
The Apollo 17 Drill Core. Part II: Comparative Modal Petrology of the >20 Micrometer and 20-10 Micrometer Size Fractions

Laul, J. C.
Chemical Study of Size Fractions of Apollo 17 Deep Drill Cores 70005, 70004, and 70003

Morris, R. V. Lauer, H. V., Jr. Gose, W. A.
Depositional and Exposure History of the Apollo 17 Deep Drill Core

Eugster, O. Eberhardt, P. Geiss, J.
Grogler, N.
History of Black and Orange Soil from Drive Tubes 74001 and 74002

Saito, K. Alexander, E. C., Jr.
40Ar-39Ar Studies of Lunar Soil 74001

Crozaz, G. Ross, L.
Nuclear Particle Tracks and the Deposition and Irradiation Histories of the Apollo 17 Deep Drill Core

Goswami, J. N. Lal, D.
Depositional History of the Apollo 17 Deep Drill Core Based on Particle Track Records

Fruchter, J. S. Rancitelli, L. A. Perkins, R. W.
History of the Apollo 17 Deep Drill String During the Past Few Million Years

Murrell, M. T. Nishiizumi, K. Arnold, J. R.
53Mn Profile in 74001/2: Comments on the Recent History of the Core

Dikov, Yu. P. Bogatikov, O. A. Barsukov, V. L.
Florensky, K. P. Ivanov, A. V. Nemoshkalenko, V. V.
Alyoshin, V. G.
X-ray Photoelectron Spectroscopy of Soil 74220

Meyer, G. von Gunten, H. R. Grutter, A.
Jost, D. Krahenbuhl, U. Wegmuller, F.
Grain-size Distribution and Origin of Trace and Major Elements in Agglutinates and Minerals of Soil 75080

Nagle, J. S.
Did Long-term Continuous Accumulation form 76001?

Monday, March 19, 1979

III-A PLANETARY BASALTIC VOLCANISM

Gilruth Center - 104

1:30 p.m.

CHAIRMEN: B. Lucchitta
J. Head

Pieters, C. M.
Highland Basalts? Spectral Data for a Southern Highland Plains Unit

Andre, C. G. Wolfe, R. W. Adler, I.
Are Early Magnesium-rich Basalts Widespread on the Moon?

Schultz, P. H. Spudis, P. D.
Evidence for Ancient Lunar Basalts

Conca, J. Hubbard, N.
Evidence for Early Volcanism in Mare Smythii

Walker, D. Stolper, E. M. Hays, J. F.
Terrestrial Basalts Revisited: The Importance of Planet Size

Whitford-Stark, J. L.
Charting the Southern Seas: The Evolution of the Lunar Mare Australe

Head, J. W.
Lava Flooding of Early Planetary Crusts: Geometry, Thickness, and Volumes of Flooded Impact Basins

Dvorak, J. Phillips, R. J.
Gravity and Magnetic Anomalies Associated with Volcanic Regions on the Moon

De Hon, R. A.
Thickness of the Western Mare Basalt

Lucchitta, B. K. Boyce, J. M.
Mare Elevations and Ages

Lucchitta, B. K. Klockenbrink, J. L.
Ridges and Scarps in the Equatorial Belt of Mars

Malin, M. C.
Geology of Venus

Wednesday, March 21, 1979

III-B VOLCANIC PROCESSES AND LANDFORMS

Building 2 Auditorium

8:30 a.m.

CHAIRMEN: R. Housley
G. Heiken

Allen, C. C.
Volcano/Ice Interactions on Mars

Settle, M.
Production of Volcanic Sulfate Aerosols on Mars

Frey, H. V. Chase, S. A. Lowry, B.
Phreatic Eruptions on Mars

Plescia, J. B. Saunders, R. S.
Styles of Faulting and Tectonics of the Tharsis Region

Plescia, J. B. Saunders, R. S. Gregory, T.
Geologic Evolution of the Tharsis Volcanoes

Head, J. W. Wilson, L.
Alphonsus-Type Dark-Halo Craters: Morphology, Morphometry, and Eruption Conditions

Bussod, G. McGetchin, T. R.
Martian Lavas - Reconnaissance Experiments on a Model Ferro-picrite Composition

Heiken, G.
Archean Ultramafic Pyroclastic Deposits: The Use of Lunar Deposits to Resolve Some Terrestrial Problems

Wilson, L. Head, J. W.
Lunar Volcanic Cones and Dark Mantling Deposits: Consequences of Patterns of Volatile Release

Wood, C. A.
Cinder Cones on Earth, Moon and Mars

Hawke, B. R. MacLasky, D. McCord, T. B.
Multispectral Mapping of the Apollo 15-Apennine Region: The Identification, Distribution, and Characterization of Regional Pyroclastic Deposits

Krahenbuhl, U. von Gunten, H. R. Jost, D.
Meyer, G. Wegmuller, F.
Trace and Major Elements in Grain Size Fractions of Two Strata of Drive Tube 74001

Cirlin, E. H. Housley, R. M.
Scanning Auger Microprobe and Atomic Absorption Studies of Lunar Volcanic Volatiles

Thursday, March 22, 1979

III-C THE SURFACE OF MARS

Gilruth Center - 206

8:30 a.m.

CHAIRMEN: J. Minear
L. Soderblom

Clark, B. C. Baird, A. K.
Chemical Analyses of Martian Surface Materials: Status Report

Arvidson, R. E. Guinness, E. A.
Changes at the Viking Landing Sites Over Short and Long Time Scales

Strickland, E. L., III
Soil Stratigraphy and Rock Coatings Observed in Color Enhanced Viking Lander Images

Evans, D. L. Adams, J. B.
Comparison of Viking Lander Multispectral Images and Laboratory Reflectance Spectra of Terrestrial Samples

Masursky, H. Dial, A. L. Strobell, M. E.
Relative Ages of Martian Volcanic Centers, Channels, Plateau Deposits, and Upland Terrains Based on Viking Data and Comparison Under Crater Counts on the Moon and Mercury

Blasius, K. R. Cutts, J. A.
Erosion and Transport in Martian Outflow Channels

Baker, V. R.
Cavitation Processes in Martian Water Flows

Singer, R. B. McCord, T. B.
Mars: Large Scale Mixing of Bright and Dark Materials and Properties of Dark Material

Huguenin, R. L.
Mars: Possible Occurrence of Near-Surface Liquid H_2O Brines in the Solis Lacus Region (-25 degrees, 85 degrees)

El-Baz, F. Maxwell, T. A.
Eolian Landforms in Southwestern Egypt: Implications for Surface Processes on Mars

Scott, D. H.
Geologic Problems in the Northern Plains of Mars

Schonfeld, E.
Origin of Valles Marineris

Monday, March 19, 1979

IV-A MARE BASALTS: PETROLOGY, CHEMISTRY, EXPERIMENTS, AND TERRESTRIAL COMPARISONS

Gilruth Center - 206

1:30 p.m.

CHAIRMEN: G. Lofgren
L. Taylor

Beaty, D. W. Hill, S. M. R. Albee, A. L.
Petrology of a New Rock Type from Apollo 11: Group D Basalts

Ma, M.-S. Schmitt, R. A.
Chemistry of a New Type of Apollo 11 Low-K Mare Basalt

Nyquist, L. Shih, C. Wooden, J.
Bansal, B. Weismann, H.
The Sr and Nd Isotopic Record of Apollo 12 Basalts

Wentworth, S. Taylor, G. J. Warner, R. D.
Keil, K. Ma, M.-S. Schmitt, R. A.
The Unique Nature of Apollo 17 VLT Mare Basalts

Norman, M. D. Ryder, G.
Luna 24 VLT Basalts: Case Against Near-surface Fractionation

Delano, J. W. Ringwood, A. E.
Chemistry and Possible Origin of the Apollo 15 Green Glass

Basu, A. Moore, C. H. Shaffer, N. R.
Apollo 15 Green Glass Vitrophyres

Grove, T. L.
An Experimental Calibration of Submicroscopic Textures in Lunar Pyroxenes: A Transmission Electron Microscope Study

Rhodes, J. M. Lofgren, G. E. Smith, D. P.
One Atmosphere Melting Experiments on Ilmenite Basalt 12008

Stanin, F. T. Taylor, L. A.
Ilmenite/Armalcolite: Effects of Rock Composition, Oxygen Fugacity, and Cooling Rate

Danckwerth, P. A. Hess, P. C. Rutherford, M. J.
Solubility of Sulphur in Mare Basalts

Brannon, J. C. Haskin, L. A. Green, J. C.
Compositional Differentiation in Planetary Flood Basalts

Thursday, March 22, 1979

IV-B TECTONICS AND CRUSTAL EVOLUTION OF TERRESTRIAL PLANETS

Gilruth Center - 104

8:30 a.m.

CHAIRMEN: K. Burke
J. Longhi

Bills, B. G.
Planetary Isostasy: Topographic and Gravitational Variance Spectra for the Moon, Mars, Venus and Earth

Haines, E. L. Metzger, A. E.
The Variation of Iron Concentration in the Lunar Highlands and Resultant Implications for Crustal Models

Solomon, S. C. Head, J. W.
Characteristics and Evolution of the Lunar Lithosphere from the Deformation of Mascon Mare Basins

Melosh, H. J.
The Thickness of the Ancient Lunar Lithosphere

Tittmann, B. R. Ahlberg, L. A. Nadler, H.
Goldberg, I. B.
Seismic Q and Velocity at Depth

Sondergeld, C. H. Granryd, L. A. Spetzler, H. A.
Compressional Velocity Measurements for a Highly Fractured Lunar Anorthosite

Oberli, F. Huneke, J. C. Wasserburg, G. J.
U-Pb and K-Ar Systematics of Cataclysm and Precataclysm Lunar Impactites

Longhi, J. Boudreau, A. E.
REE in the Magma Ocean: Magma Mixing; the Anorthosite Trend

McKay, G. Wiesmann, H. Bansal, B.
The KREEP-Magma Ocean Connection

Mittlefehldt, D. W.
The Nature of Asteroidal Differentiation Processes

Phinney, W. C. Morrison, D. A. Ashwal, L. D.
Cochran, A.
Anorthosite Inclusions in Northeastern Minnesota: Remnants of Early Terrestrial Crust?

Smith, J. V. Newton, R. C. Janardhan, A. S.
Significance of Granulite Metamorphism for Stabilization of Planetary Crust: Charnockite Formation at Kabbaldurga, S. India: Roles of CO_2 and H_2O; Speculations on Venus and Mars

Thursday, March 22, 1979

IV-C ACHONDRITIC METEORITES AND LUNAR HIGHLANDS ROCKS

Gilruth Center - 206

1:30 p.m.

CHAIRMEN: M. Prinz
O. James

Hewins, R. H.
The Pyroxene Chemistry of Four Mesosiderites

Floran, R. J.
Major Element and Petrographic Correlations in the Silicate Portions of Mesosiderites

Snellenburg, J. W. Nehru, C. E. Caulfield, J. B. D.
Zucker, S. Prinz, M.
Petrology of Temperature and Oxygen Fugacity Indicating Mineral Assemblages in Four Low-grade Mesosiderites

Berkley, J. L. Keil, K. Prinz, M. Gomes, C. B.
The Governador Valadares Nakhlite and its Relationship to Other Nakhlites

Wooden, J. L. Nyquist, L. E. Bogard, D. D.
Bansal, B. M. Weismann, H. Shih, C.-Y.
McKay, G. A.
Radiometric Ages for the Achondrites Chervony Kut, Governador Valadares, and Allan Hills 77005

McSween, H. Y., Jr. Taylor, L. A.
Stolper, E. Muntean, R. A. O'Kelley, G. D.
Eldridge, J. S.
Petrogenesis of the Allan Hills 77005 Achondrite

Klein, L. C. Hewins, R. H.
Provenance of Metal and Melt Rock Textures in the Bununu Howardite

Takeda, H. Ishii, T. Miyamoto, M.
Pyroxenes in Early Crustal Cumulates Found in Achondrites and Lunar Highland Rocks

Allen, F. Bence, A. E. Grove, T. L.
Olivine Vitrophyres in Apollo 14 Breccia 14321: Samples of the High Mg Component of the Lunar Highlands

Herzberg, C. T.
Identification of Pristine Lunar Highland Rocks: Criteria Based on Mineral Chemistry and Stability

CONSORTIUM PAPERS: PRESENTATIONS TO BE COMBINED TO FIT AVAILABLE TIME

James, O. B. McGee, J. J.
Consortium Breccia 73255: Genesis and History of Two Coarse-Grained "Norite" Clasts

Nord, G. L., Jr. McGee, J. J.
Thermal and Mechanical History of Granulated Norite and Pyroxene Anorthosite Clasts in Breccia 73255

Blanchard, D. P. Budahn, J. R.
Clasts from Consortium Breccia 73255; Remanents from the Early Lunar Crust?

Jessberger, E. K.
Ancient Pink-Spinel-Bearing Troctolitic Basalt in Apollo 17 Breccia 73215

Morgan, J. W. Petrie, R. K.
Siderophile and Volatile Trace Elements in Breccias 73215 and 73255 and in Core 74001

Staudacher, Th. Dominik, B. Flohs, I.
Jessberger, E. K. Kirsten, T.
New 40Ar-39Ar Ages for Aphanites and Clasts of Consortium Breccia 73255

Eichhorn, G. James, O. B. McGee, J. J.
Schaeffer, O. A.
Consortium Breccia 73255: Preliminary 39Ar-40Ar Laser Dating of Aphanite Samples

Monday, March 19, 1979

V-A PLANETARY CRATERING

Gilruth Center - 104

8:30 a.m.

CHAIRMEN: A. Woronow
G. Neukum

Clanton, U. S. Morrison, D. A.
Hypervelocity Impact Craters Less Than 1000 A Diameter

Schultz, P. H. Mendenhall, M. H.
On the Formation of Basin Secondary Craters by Ejecta Complexes

Thompson, T. W. Hartmann, W. K. Roberts, W. J.
Shorthill, R. W. Zisk, S. H.
Lunar Megaregolith Properties from Blocky Crater Studies

Aggarwal, H. R. Oberbeck, V. R.
Monte Carlo Simulation of the Lunar Regolith and Implications

Lange, M. A. Ahrens, T. J.
Impact Melting During the First 1.5 B.Y. of Lunar History

Chapman, C. R. Aubele, J. C. Roberts, W. J.
Cutts, J. A.
Sub-Kilometer Lunar Craters: Origins, Ages, Processes of Degradation, and Implications for Mare Basalt Petrogenesis

Woronow, A.
Lunar and Martian Crater Classes

Mouginis-Mark, P. J. Head, J. W.
Emplacement of Martian Rampart Crater Ejecta Blankets: A Morphological Analysis

Neukum, G. Hiller, K. Henkel, J. Bodechtel, J.
Surface Ages of Martian Shield Volcanoes and Channels

Frey, H. V. Lowry, B. L.
Large Impact Basins on Mercury: Implications for Relative Crater Production Rates

Gault, D. E. Sonett, C. P. Wedekind, J. A.
Tsunami Generation by Pelagic Planetoid Impact

Strelitz, R. A.
Meteorite Impact in the Ocean

Tuesday, March 20, 1979

V-B EFFECTS OF SHOCK ON PLANETARY MATERIALS

Gilruth Center - 104

8:30 a.m.

CHAIRMEN: D. Stoffler
R. Jeanloz

Bauer, J. F.
Experimental Shock Metamorphism of Mono- and Polycrystalline Olivine: A Comparative Study

Jeanloz, R.
Ringwoodite: Complex Aggregate Misidentified as a High-pressure Spinel Structure

Schaal, R. B. Thompson, T. D. Horz, F.
Bauer, J. F.
Experimentally Shocked Lunar Basalt: Massive and Particulate

Sclar, C. B. Kastelic, R. L. Bauer, J. F.
Subsolidus Shock-Induced Reduction of Fe+2 on the Moon: Evidence from Experimentally Shocked Ulvospinel

Palme, H. Gobel, E. Grieve, R. A. F.
The Distribution of Volatile and Siderophile Elements in the Impact Melt of Clearwater East (Quebec)

Simonds, C. H. McGee, P. E.
Petrology of Impactites, Lake St. Martin, Manitoba Impact Structure

Taylor, S. R. McLennan, S. M.
Chemical Similarity Between Irghizites and Javan Tektites

Glass, B. P. Swinki, M. B. Zwart, P. A.
Deep-sea Microtektites: Correlation with Other Earth Events and Implications Concerning the Magnitude of Tektite-producing Events

Uhlmann, D. R. Onorato, P. I. K.
A Simplified Model for Glass Formation

Uhlmann, D. R. Onorato, P. I. K. Yinnon, H.
Taylor, L. A.
Partitioning as a Cooling Rate Indicator

Arndt, J.
Simulation Experiments on the Radiation Cooling of Lunar Glasses

von Engelhardt, W.
Crystallization Behaviour of Ilmenite in Lunar Rocks of Endogenic and Impact Origin

Tuesday, March 20, 1979

V-C CRATERING PROCESSES

Gilruth Center - 206

1:30 p.m.

CHAIRMEN: J. Melosh
D. Orphal

Holsapple, K. A. Schmidt, R. M.
A Material Strength Model for Apparent Crater Volume

Cohn, S. N. Ahrens, T. J.
Dynamic Tensile Strength of Analogs to Lunar Rocks

Bryan, J. B. Burton, D. E. Lettis, L. A., Jr.
Calculational Comparisons of Explosion and Impact Cratering in Two-dimensions Using Barringer Crater as a Prototype

Thomsen, J. M. Austin, M. G. Ruhl, S. F. Orphal, D. L.
Schultz, P. H.
Investigation of the Mechanics of Impact Cratering

O'Keefe, J. D. Ahrens, T. J.
The Effect of Gravity on Impact Crater Excavation Time and Maximum Depth; Comparison with Experiment

Melosh, H. J. McKinnon, W. B.
Theoretical and Experimental Study of Crater Collapse

Dence, M. R. Grieve, R. A. F.
The Formation of Complex Impact Structures

Roddy, D. J.
Current Drilling and Structural Studies at the Flynn Creek Impact Crater, Tennessee

Pai, S. I. Menon, S. Schultz, P. H.
Effects of Lift Force on the Ejecta Transport

Kieffer, S. W. Simonds, C. H.
The Role of Volatiles in the Cratering Process

Gaffney, E. S.
Equation of State of Ice and Frozen Soils

Cintala, M. J. Parmentier, E. M. Head, J. W.
Characteristics of the Cratering Process on Icy Bodies: Implications for Outer Planet Satellites

Monday, March 19, 1979

VI-A SOLAR AND GALACTIC RADIATIONS

Gilruth Center - 206

8:30 a.m.

CHAIRMEN: P. Pellas
I. Hutcheon

Bhandari, N. Bhattacharya, S. K. Potdar, M. B.
Production Profiles of Radionuclides in Chondrites and Their Solar Cycle Variation

Regnier, S. Hohenberg, C. M. Marti, K.
Reedy, R. C.
Predicted versus Observed Cosmic-ray Produced Noble Gases in Lunar Samples: Improved KR Production Ratios

Melcher, C. L.
Thermoluminescence Measurements of Antarctic Meteorites

Evans, J. C. Rancitelli, L. A.
Non-destructive 26Al Measurements on Antarctic Meteorites

Bhandari, N. Prabhakara, H. R. Raman, T.
Meteorite Record of the Cosmic Rays During the Maunder Minimum Based on 39Ar

Schaeffer, O. A. Nagel, K. Neukum, G. Fechtig, H.
Effects of Micrometeorite Bombardment on Cosmic Ray Ages of Stony and Iron Meteorites: Evidence for a Long Term Temporal Change in Cosmic Ray Intensity

Fireman, E. L.
Carbon-14 in Lunar Samples and in Stony Meteorites

Wieler, R. Funk, H. Horn, P. Signer, P.
The Solar Wind Half an Aeon Ago; Light Noble Gases in 15002 Core Soil Constituents

Thiemens, M. H. Clayton, R. N.
Ancient Solar Wind in Lunar Microbreccias

Pepin, R. O. Phinney, D.
Fission and Fractionation in Lunar Xenon and the Composition of Solar Wind Xenon

Bernatowicz, T. J. Hohenberg, C. M.
Podosek, F. A.
Surface-Correlated Krypton and Xenon in Grain Size Separates from Breccia 14301

Rao, M. N. Venkatesan, T. R. Goswami, J. N.
Nautiyal, C. M.
Solar Cosmic Ray Produced Neon and Argon Isotopes and Particle Tracks in Apollo 16 Soils and Rocks and Their Solar Flare Exposure Ages

Tuesday, March 20, 1979

VI-B GRAIN SURFACES AND SOLAR WIND EFFECTS

Gilruth Center - 206

8:30 a.m.

CHAIRMEN:
T. Kirsten

Jull, A. J. T. Wilson, G. C. Long, J. V. P.
Reed, S. J. B. Pillinger, C. T.
Ion Microprobe Study of Sputtering Rates of Minerals

Hartung, J. B. Eichhorn, G. Muller, H. W.
Schaeffer, O. A.
Helium, Neon, and Argon on an Exposed Lunar Surface by Laser Probe Mass Spectrometry

Housley, R. M. Grant, R. W.
X-ray Photoemission Studies of the Surface Composition of Lunar Impact Glass Samples Including 12054

Tombrello, T. A.
Simulation Experiments and Planetary Sputtering Phenomena

Warhaut, M. Kiko, J. Kirsten, T.
High Resolution Depth Profiles of Solar Wind Implanted Rare Gases in Lunar Minerals and Glasses

Becker, R. H.
Light Elements in Lunar Soils Revisited: Carbon, Nitrogen, Hydrogen, and Helium

Kerridge, J. F. Kaplan, I. R.
Carbon, 13C, N and He in Grain Size Fractions Sieved in Liquid Argon

Fallick, A. E. Gardiner, L. R. Jull, A. J. T.
Pillinger, C. T.
Studies of the Hydrolysable Carbon and Finely Divided Iron in Separates from Highland Soil 68501

Hartung, J. B.
Silicate 'Fog' from Lunar Impact Cratering Events

McDonnell, J. A. M. Allison, R. J.
Luna Core Spherules: Microparticle Impact Crater and Accreta Populations as Indicators of the Past Surface Environment

Cour-Palais, B. G.
Results of the Examination of the Skylab/Apollo Windows for Micrometeoroid Impacts

Zook, H.
The Spacecraft Determined Micrometeoroid Flux and its Application to Problems in Lunar Research

Watson, C. C. Haff, P. P. Tombrello, T. A.
Solar Wind Sputtering of Planetary Atmospheres and Surfaces

Tuesday, March 20, 1979

VII-A CHONDRITIC METEORITES

Building 2 Auditorium

1:30 p.m.

CHAIRMEN: S. Haggerty
G. Reed

Allen, J. Nozette, S. Wilkening, L. L.
Chondrule Rims: Composition and Texture

Grossman, J. N. Kracher, A. Wasson, J. T.
Compositional and Petrographic Constraints on the Origin of Chainpur Chondrules

Hamilton, P. J. Evenson, N. M. O'Nions, R. K.
Chronology and Chemistry of Parnallee (LL-3) Chondrules

Unruh, D. M. Hutchison, R. Tatsumoto, M.
U-Th-Pb Systematics and Uranium Isotopic Composition of Chondrites

Chen, J. H. Tilton, G. R.
Preliminary Studies of Uranium Isotopic Composition in Chondritic Meteorites

Scott, E. R. D. Rajan, R. S.
Thermal History of the Shaw Chondrite

Pellas, P. Storzer, D. Kirsten, T. Jordan, J. Richter, H.
Pu-244/U-238 Ratios in Whitlockites of Ordinary Chondrites: A Possible Chronological Tool

Benjamin, T. M. Jones, J. H. Burnett, D. S.
Laboratory Partitioning Studies, Testing the Validity of 244Pu-Rare Earth Chronology

Nagasawa, H. Onuma, N.
High Temperature Heating of the Allende Meteorite II. Fractionation of the Rare Earth Elements

Clayton, R. N. Mayeda, T. K. Onuma, N.
Oxygen Isotopic Compositions of Some Antarctic Meteorites

Watters, T. R. Prinz, M.
Aubrites: Their Origin and Relationship to E Chondrites

Richter, G. Wolf, R. Anders, E.
Aubrites: Are They Direct Nebular Condensates?

Wednesday, March 21, 1979

VII-B PRIMORDIAL NOBLE GASES AND OTHER TOPICS

Gilruth Center - 104

8:30 a.m.

CHAIRMEN: K. Marti
O. Schaeffer

Eberhardt, P. Jungck, M. H. A. Meier, F. O. Niederer, F.
Neon-E: New Limits for Isotopic Composition. Two Host Phases?

Lewis, R. S. Alaerts, L. Anders, E.
Isotopic Anomalies in the Orgueil Meteorite: Neon-E, s-Process Xe, and CCFXe

Alaerts, L. Lewis, R. S. Anders, E.
Host Phases of Neon-E and s-Process Xenon in the Murchison C2 Chondrite

Mackinnon, I. D. R. Buseck, P. R.
High Resolution Transmission Electron Microscopy of the Murchison Carbonaceous Chondrite and the Kenna Ureilite

Dran, J. C. Klossa, J. Maurette, M.
A Preliminary Microanalysis of the Berkeley Gas-Rich Allende Residue

Frick, U. Mack, R. Chang, S.
Noble Gas Fractionation During Synthesis of Carbonaceous Matter

Heymann, D. Dziczkaniec, M.
Isotopic Compositions of Xenon from Explosive Carbon Burning: a Global Look

Clayton, D. D.
Primitive Troilite

Brownlee, D. E. Pilachowski, L. B. Hodge, P. W.
Meteorite Mining on the Ocean Floor

Fraundorf, P. Shirck, J.
Microcharacterization of 'Brownlee' Particles: Features Which Distinguish Interplanetary Dust from Meteorites?

Turner, G. Enright, M. C. Hennessy, J.
Dating Heavenly Bodies and Monte-Carlo Models

Bogard, D. D.
40Ar/39Ar Studies and Cooling Rate Determinations of Heavily Shocked Chondrites

Thursday, March 22, 1979

VII-C THE ALLENDE METEORITE

Building 2 Auditorium

8:30 a.m.

CHAIRMEN: U. Marvin
E. King

Simon, S. B. Haggerty, S. E.
Petrography and Olivine Mineral Chemistry of Chondrules and Inclusions in the Allende Meteorite

El Goresy, A. Nagel, K. Ramdohr, P.
Some Unique Textural Features of Spinels in Allende CAIs: A Possible Key Evidence for the Formational History in the Solar Nebula

Wark, D. A. Wasserburg, G. J. Lovering, J. F.
Structural Features of Some Allende Coarse-Grained Ca-Al-Rich Inclusions: Chondrules Within Chondrules

Allen, J. M. Grossman, L. Lee, T.
Wasserburg, G. J.
Mineralogical Study of an Isotopically-Unusual Allende Inclusion

Tanaka, T. Davis, A. M. Grossman, L.
Lattimer, J. M. Allen, J. M. Lee, T.
Wasserburg, G. J.
Chemical Study of an Isotopically-Unusual Allende Inclusion

Lee, T. Russell, W. A. Wasserburg, G. J.
A new member of the 'FUN' family

Phinney, D. Macdougall, J. D. Whitehead, B.
Magnesium Isotopes in Hibonite-bearing Inclusions from CM Meteorites

Steele, I. M. Hutcheon, I. D.
Anatomy of Allende Inclusions: Mineralogy and Mg Isotopes in two Ca-Al-Rich Inclusions

Esat, T. M. Papanastassiou, D. A. Wasserburg, G. J.
Trials and Tribulations of 26Al: Evidence for Disturbed Systems

Niederer, F. R. Papanastassiou, D. A.
Ca Isotopes in Allende and Leoville Inclusions

Zaikowski, A.
I-Xe Chronology of Allende Inclusions

Wasserburg, G. J. Huneke, J. C.
I-Xe Dating of I-Bearing Phases in Allende

Bunch, T. E. Chang, S.
Thermal Metamorphism (Shock?) and Hydrothermal Alteration in C3V Meteorites

Thursday, March 22, 1979

VII-D ORIGIN OF THE SOLAR SYSTEM

Building 2 Auditorium

1:30 p.m.

CHAIRMEN: J. Arnold
E. Anders

Wiita, P. J. Schramm, D. N.
Star and Planetary System Formation in Disks

Boss, A. P. Peale, S. J.
Nonaxisymmetric Models of Collapsing, Rotating Protostars

Wetherill, G. W.
Steady-State Velocity Distribution of a Protoplanetary Swarm

Kaula, W. M.
Relative Velocities of Planetesimals

Matsui, T.
Collisional Evolution of Mass-Distribution Spectrum of Planetesimals II

Weidenschilling, S. J.
Behavior of Dust in the Solar Nebula

Coradini, A. Magni, G. Federico, C.
On Protoplanets Formation Via Gravitational Instabilities in a "Dusty" Solar Nebula

Margolis, S. H. Falk, S. W. Schramm, D. N.
The Edge of the Early Solar System: Source Region for Isotopic Anomalies in Meteorites?

Consolmagno, G. J. Cameron, A. G. W.
The Nucleosynthesis Components of Isotopic Anomalies in Allende Inclusions

McCrumb, J. L. Friedman, N. Fitzgerald, R.
Arrhenius, G.
Kinetic Isotope Fractionation in Interstellar Medium Upper Atmosphere and Meteorites, Inferred from Model Experiments

Strangway, D. W. Sugiura, N.
Magnetic Fields in Solid Objects of the Solar System: Did They Become Magnetized in a Solar Dipole Field?

Smith, J. V.
A New Heterogeneous Accretion Model for the Inner Planets Especially the Earth

Kelly, W. R. Wasserburg, G. J.
Evidence of 107Pd in the Early Solar System

VIKING IMAGERY AT LPI

The Photo Library at the LPI has recently acquired Viking Orbiter and Lander photography. The Orbiter images include 5"x5" contact prints, and, 8"x10" and 20"x24" mosaics. Negatives are available for the mosaics and some of the individual images. Hard copy indexes provide easy access by picture number, latitude or longitude, quad number and a 10° box number. The mosaics are also indexed by feature name. An index to images of Phobos and Deimos is also available.

The Lander Primary Mission images consist of 5"x5" contact prints, and, 8"x10" and 20"x24" mosaics. Negatives are available for the mosaics. Index to the Lander imagery has been published in NASA Reference Publication 1007. (Tucker, Robert B., VIKING LANDER IMAGING INVESTIGATION: Picture catalog of primary mission experiment data record. NASA, 1978, 568 pp. Available from National Technical Information Service $16.25) A listing of the individual photos used in the mosaics is also available.

Local researchers, students, faculty and other interested persons are encouraged to visit the Photo Library to view the Viking products. Arrangements for lending materials will be made whenever possible. LPI Photo Library personnel can also assist you in obtaining materials for your own retention. As a member of the system of Regional Planetary Image Facilities, use of these products by interested persons throughout the country is encouraged.

The LPI Photo Library wishes to thank the many people who helped in the acquisition of the Viking products. For further information contact Mr. Ron Weber, LPI Photo Library, 713/486-2172.

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ATTENTION: TENTH L&PSC PARTICIPANTS

As was forewarned in previous mailing, getting a hotel room in the NASA area for the week of the Conference has now become a serious problem. If you have not yet arranged for a place to stay, you may wish to consider motels farther from the NASA area. Those listed here are all within 30-minutes' driving time from NASA; Ramada Inn, Hobby Airport, 7777 Airport Blvd., Houston 713/644-1261, $31 single; LaQuinta Inn, 1121 Hwy. 146 N, Texas City 713/948-3101, $20 single; Holiday Inn, 110 E. Hwy. 6, Alvin 713/331-5227, $26 single. If you still cannot find a room you might try Galveston or South Houston. Good luck!!!!

NINTH PROCEEDINGS VOLUMES MAILED TO FIRST AUTHORS

Sets of the Ninth Proceedings have been mailed to all first authors direct from the publisher. If you have not received your copy or if there are any problems with them, please contact the Publications Office at the LPI (Paula Robertson, 713/486-2161).

SUMMER PROGRAM AT LPI - UNDERGRADUATE INTERNS - June 4 - August 10, 1979

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 4 and ends August 10, 1979, although these dates can be adjusted somewhat to fit individual schedules. The weekly stipend will be $115, plus $70/week living expenses, and assistance with travel costs.

AREAS OF RESEARCH INTERESTS: 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 1979 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 factor. Selection is based upon the following criteria: (1) Scholarship, curriculum and experience, (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, 1979.

APPLICATION: 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. Please use the enclosed application form (copy form as needed). In addition, arrange for the sending of official transcripts and three letters of recommendation covering academic achievement, career potential and character. Transmit these materials by MARCH 15, 1979, to:

SUMMER INTERN PROGRAM
The Lunar & Planetary Institute
3303 NASA Road 1
Houston, TX 77058

Questions concerning the program should be directed to Mrs. Pam Jones, (713)486-2150.

GLASS AND CERAMIC INDUSTRIES IN SPACE BASED ON LUNAR MATERIALS

LUNAR AND PLANETARY INSTITUTE *16-19 APRIL 1979*

This four-day workshop is being organized by Prof. John D. Mackenzie (UCLA-Materials Science Dept.) and Dr. David R. Criswell (LPI). The objectives are to: 1) identify traditional and exotic products for use in space and on earth which can be produced primarily from lunar materials; 2) characterize the production systems and processes necessary to make several of the products on the moon and in cis-lunar space; and 3) list research and development needs, strategies and time scales leading to production in space facilities. Contact Ms. Thanny Morrison, LPI, 713/486-2156 for an information packet on the workshop.

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KAHN,P.G. (DEPARTMENT OF GEOLOGICAL AND GEOPHYSICAL SCIENCES, PRINCETON UNIVERSITY, PRINCETON, NJ 08540): NAUTILOID GROWTH RHYTHMS AND DYNAMICAL EVOLUTION OF THE EARTH-MOON SYSTEM
NATURE VOL. 275, 606-611 (1978)

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COOK,A.H. (CAVENDISH LABORATORY, MADINGLEY ROAD, CAMBRIDGE, CB3 OHE ENGLAND): ON THE CONSTITUTION OF THE MOON'S MANTLE
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THE MOON AND THE PLANETS VOL. 19, 513-517 (1978)

RAITALA,J. (AAREN KARJALAINEN OBSERVATORY, UNIV. OF OULU, OULU, FINALND): TECTONIC PATTERN OF MARE RIDGES OF THE LETRONNE-MONTES RIPHAEUS REGION OF THE MOON
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ASTRONOMICHESKII ZHURNAL VOL. 55, 617-627 (1978)

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MOON. CHEMICAL COMPOSITION, PETROLOGY

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MOON. CHEMICAL COMPOSITION.(CONT.)

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THE ASTROPHYSICAL JOURNAL VOL. 226, 350-354 (1978)

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SCIENTIA GEOLOGICA SINICA VOL. 1978, 113-133 (1978)

C A L E N D A R

Feb. 26	Total eclipse of the sun in certain areas of North America
Mar. 1	American Geophysical Union, Spring Meeting ABSTRACTS DEADLINE
Mar. 3	U.S. Geological Survey's Centennial Day Ceremonies and tours at Reston and regional ~~centers in~~ Rolla, Denver and Menlo Park. The Survey plans commemorative programs, symposiums, special publications and exhibits to illustrate earth science as a public service. Events may be held March 2 or 3 or both. CONTACT: Clifford Nelson, U.S.G.S. Mail Stop 950, Reston, VA 22092
MAR. 19-23	TENTH LUNAR AND PLANETARY SCIENCE CONFERENCE Johnson Space Center and Lunar and Planetary Institute (See this BULLETIN for preliminary program and other news items)
Apr. 23	DEADLINE - Tenth Lunar and Planetary Science Conference Proceedings paper manuscripts
Apr. 23-27	Solar-Terrestrial Predictions, Boulder, CO Sponsored by NOAA and AGU CONTACT: R. F. Donnelly, STP/PW Program Space Environment Laboratory, NOAA/ERL Boulder, Co 80302
May 14-17	Princeton/AIAA Conference on Space Manufacturing and Space Colonies CONTACT: Princeton Conference Office 5 Ivy Lane Princeton, NJ 08540
May 21-26	Early Precambrian Volcanology and Sedimentology Quebec City, Canada. Sponsored by Geological Association of Canada and International Geological Correlation Programme--working group 160. CONTACT: E. Dimroth (Convener) Sciences de la Terre Universite du Quebec a Chicoutimi Chicoutimi, Que. CANADA G7H 2B1

CALENDAR (CONT.)

May 28-June 1

American Geophysical Union, Spring meeting
Washington, D.C.
CONTACT: AGU
1909 K Street NW
Washington, DC 20006

May 29-June 9

COSPAR 22nd Plenary Meeting
Bangalore, India
CONTACT: COSPAR Secretariat
51 bd de Montmorency
75016 Paris, France

June 24-29

Granitic Rocks and Batholiths: Penrose Conference
Fairmont Hot Springs, Anaconda, Montana
Convenors: Charles Vitaliano, Indiana University
Lee Suttner, Indiana University
Donald Hyndman, Univ. of Montana
CONTACT: Lois Elms
Penrose Conference Coordinator
The Western Experience
1140 Pearl Street, Suite 219
Boulder, CO 80302

July 16-22

Hawaii Symposium on Intraplate Volcanism and Submarine Volcanism
Maniloa Surf Hotel, Hilo, Hawaii
(Registration and accommodations deadline APRIL 1)
CONTACT: Hawaii Symposium
Western Experience
1140 Pearl Street, Suite 219
Boulder, CO 80302

Aug. 14-24

IAU General Assembly
Montreal, Canada
CONTACT: Prof. P. A. Wayman
IAU Asst. Sec. Gen
Dunsink Observatory
Castleknock Co., Dublin, Ireland

Oct. 23-26

AAS/Division for Planetary Science
Holiday Inn, Clayton, MO
CONTACT: Prof. Raymond E. Arvidson
Dept. Earth & Planetary Sciences
Washington University
St. Louis, MO 63130

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