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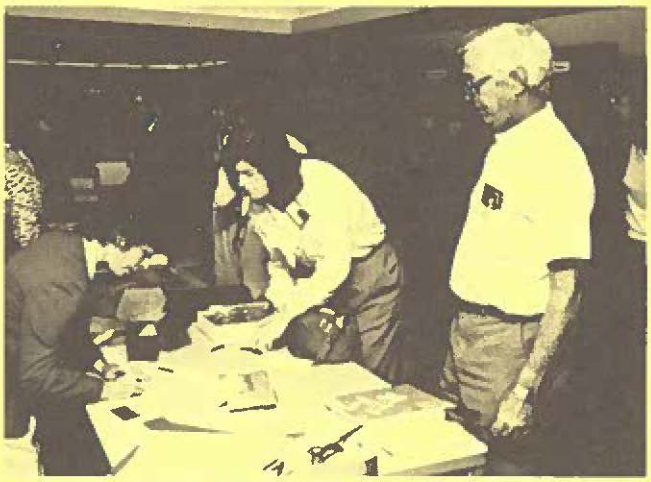
lunar & planetary information bulletin

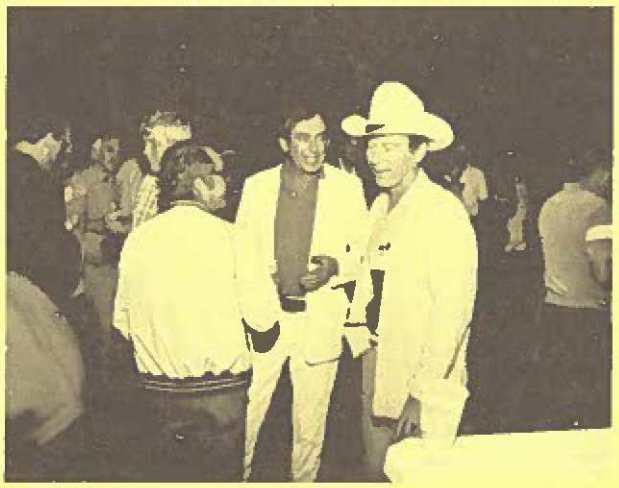
NUMBER 41 MAY 1985

XVIth LPSC CONFERENCE —COME AND GONE!

The Sixteenth Lunar and Planetary Science Conference was held at NASA Johnson Space Center (NASA/JSC) in Houston on March 11-15, 1985. Conference sponsors were: the Lunar and Planetary Institute (LPI); NASA/JSC; the American Geophysical Union (AGU); the Division for Planetary Sciences of the American Astronomical Society (DPS); the Geological Society of America (GSA); the International Union of Geological Sciences (IUGS); and the Meteoritical Society. Members of the program committee were: Kevin Burke, LPI, and Michael Duke, NASA/JSC(Co-chairmen); Bruce Bills, LPI; Douglas Blanchard, NASA/JSC; Robin Brett, U. S. Geological Survey (USGS); Mark Cintala, NASA/JSC; Donald Davis, Planetary Science Institute (PSI); Richard Grieve, Energy, Mines and Resources Canada; Charles Hohenberg, Washington University; Baerbel Lucchitta, USGS; Robert Pepin, University of Minnesota; William Phinney, NASA/JSC; Carle Pieters, Brown University; Sundar Rajan, Jet Propulsion Laboratory (JPL); Alan Rubin, UCLA; Edward Scott, University of New Mexico; Lawrence Taylor, University of Tennessee; Glenn Veeder, JPL; Ann Vickery, University of Arizona; Donald Wise, University of Massachusetts; John Wood, Smithsonian Astrophysical Observatory; and James Zimbelman, LPI.



Abstracts submitted for the Conference were considered by the Program Committee for inclusion in *Lunar and Planetary Science XVI* and/or for oral or poster



presentation at the Conference. Of the 500 abstracts submitted, 497 were published in *Lunar and Planetary Science XVI and Supplement A*, 315 were selected for oral presentation, and 22 were selected for poster presentation. 550 scientists representing 14 countries attended the conference.

Four special sessions were held during the Conference. The *Florensky Memorial: Venus Special Session* on Monday morning, March 11, was chaired by Dr. V.L. Barsukov and Dr. J.W. Head. It included invited presentations and a panel discussion on the U.S. and U.S.S.R. Venus missions results. A Monday evening session for poster presentations was followed by a special session *Future Planetary Programs* chaired by Dr. M.B. Duke. This session included presentations from invited speakers on the future space program plans of the United States and the Soviet Union. On Thursday evening, March 14, *the LPSC Forum*, an open discussion of all Lunar and Planetary Science Conference concerns, was led by Dr. K. Burke. All conference participants were invited to attend and participate in the Forum discussion. The minutes of this Forum are published elsewhere in this issue of the *LPIB*.

Other spin-off meetings held during the conference week included a meeting of the Ganymede Mappers. The European Planetary Scientists met on Wednesday evening convened by Keith Runcorn. The Regional Planetary Image Facility librarians and directors met on Tuesday to discuss plans for the data which will be forthcoming from the planetary encounters and Galileo missions.

Fifteen teams competed in this year's Sixth Annual Chili Cook-Off and barbeque dinner. The evening activities included the awarding of trophies to the winners of the cook-off and special events such as the cow chip throwing contest, the beer drinking contest, and the jalapeno eating contest.

Copies of *Lunar and Planetary Science XVI*, abstracts submitted to the conference are still available for mailing and handling costs only. Please use the order form included in this *BULLETIN* if you have not yet ordered your copy.

Summaries of the research reported at the conference will be published in the June issue of *Geotimes*. Other accounts of the conference can be found in *Science News* and *Aviation Week and Space Technology*.

LUNAR AND PLANETARY SCIENCE CONFERENCE FORUM

As previously announced in the LPIB, the second annual *Lunar and Planetary Science Conference Forum* was held during the 16th LPSC. This informal yearly meeting is open to all conference participants and serves as a vehicle for expressing community concerns regarding this major meeting and its publications. Although the turnout was somewhat light (about 125 people), the discussions were lively and provocative. To record the events of the meeting and to inform all of the community about the discussions and recommendations, the minutes are published here.

MINUTES OF THE 16th LPSC FORUM
March 14, 1985 8:00pm Gilruth Center

The second meeting of the Lunar and Planetary Science Conference Forum was called to order by its Chairman, Dr. Kevin Burke at 8:20 p.m., March 14, 1985, in Room 104 of the Gilruth Recreation Center. John O'Keefe was appointed recorder.

The first agenda item was conference T-shirts, which were stated to be of excellent quality and available at this meeting for $7.00. For next year several people registered a request for the shirts in a color other than black, as black was considered unsuitable for warmer climates.

Next was a report by Robin Brett, Chairman of the Subcommittee on Publications of the Planetary Meetings Steering Committee. Brett reported the results of a questionnaire to which over 200 replies had been received. The following recommendations had emerged from a review of the replies:

1. Lunar and Planetary Science Conference Proceedings to be continued with *JGR* as publisher for at least another year.

2. Circulation and distribution should be improved by issuing the Proceedings as a regular issue of *JGR Red* to all subscribers.

3. Page charges should be lowered by such means as subsidies to foreign authors, LPI preparing camera-ready copy, etc.

4. An appreciable segment of the community has the perception that standards of review and acceptance of Proceedings papers are lower than for *JGR Red* and some other journals. The Proceedings editors should be made aware of this and correct it if the perception is true.

5. The PMSC should review *JGR*'s performance in one year, especially in the areas mentioned above. If there has not been appreciable improvement, the association with *JGR* should be discontinued.

An animated discussion followed, from which it appeared that alternative publication options can be found. The Chairman stated that alternate solutions would be explored, while at the same time continuing to negotiate the suggested changes with *JGR*.

The third item was a debate on the subject "Should a short abstract be substituted for the present two-page 'short paper'?" (Arguments for and against were published in the March issue of the *LPIB*.) Although both sides put forth solid arguments, a majority of those present favored the present two-page format, but felt its value would be greatly enhanced if the abstract volumes were distributed to everyone well in advance of the meeting. The current schedule does not allow the volumes to be

compiled, printed and mailed in time to reach participants before they must leave for the meeting, particularly those in foreign countries. A number of suggestions to overcome this problem were put forth:

1. impose a late fee as well as an absolute drop-dead due date for abstracts to allow for earlier publication.

2. Send volumes to all those who pre-register prior to a specific deadline.

3. Review the possibilities for getting faster service to participants in Europe who currently do not receive early copies. (Burke agreed to look into this.)

4. Send early copies to ALL authors, rather than only to correspondence authors as is the current policy.

Burke agreed to explore these and other options with those involved in compilation and printing, as well as with the PMSC and the LPSC Program Committee prior to next year's meeting.

It also was suggested that placing several opened copies of abstract volumes around the coffee area during the conference would alleviate the necessity of carrying the heavy volumes to and from the conference in order to read abstracts prior to talks.

A request was received to reinstate the subject index in the abstract volumes. A number of speakers urged that the abstracts be printed in the order of the conference program. The Chairman will convey these requests to next year's LPSC program committee.

The next topic was the conference program guide. Should it contain a timed schedule so that people could go from one talk to another? An objection was raised that if a speaker failed to show, time would be wasted in order to adhere to the printed schedule. Others stated that printed times did not allow for discretion on the part of the session chairmen to monitor the length of discussions. It was suggested that some system of posting which talk was in progress at each session be re-established, perhaps showing talks in progress on a computer screen at each location. On a related topic, it was suggested that session chairmen be given more explicit instructions on how to properly guide discussions and timing within sessions.

Several complaints were registered regarding the quality of the audio-visual services this year. It was stated that projectionists were (a) inattentive (frequently failing to respond to "next slide please" cues), (b) carried on disruptive conversations during presentations, (c) occasionally failed to orient slides correctly, and on one occasion had the wrong speaker's slides on the screen. Further complaints included no pointers available for speakers, no zoom lenses on the projectors, a feedback problem with the mikes, and poor sound in general. It was recommended that a formal protest be issued to those responsible for overseeing audio-visual services.

A complaint was registered that the gymnasium was too cold, and that noise from the upstairs hallway was very disruptive to the sessions in the gym.

Complaints were issued by participants about having papers for which oral presentation was requested "relegated to poster presentation" without consent of the authors. The Chairman refused to accept the term "relegated," stating that a poster presentation was equivalent to an oral presentation. It was stated that in the past the LPSC program committees sought the approval of authors prior to assigning a paper a poster designation, and that this policy should be re-instated. It was mentioned that this year's placement of the posters in the gym resulted in their being inaccessible for a majority of the time. It was recommended that posters be moved to room 204 for LPSC XVII.

It was noted that three meetings on Mars had been scheduled for this year, and the question was raised as to why the PMSC did not do more to coordinate scientific meetings to avoid such overlaps. The Chairman noted that the committee can make recommendations but cannot police the decisions by independent groups to hold meetings. The publication of scheduled meetings in the *LPIB* was said to be one effective way of announcing possible overlapping topics among planned meetings.

The Chairman raised the question as to whether the Forum should be continued and scheduled for next year. There was general agreement and a voice vote in favor of continuing to hold the annual LPSC Forum.

A motion to adjourn the meeting was received at 10:00 p.m. This motion was seconded and passed, and the meeting was adjourned.

RARE ALIGNMENT OF PLUTO AND CHARON SUPPLIES NEW DATA

A rare alignment of Pluto and its only known satellite, Charon, in which they take turns eclipsing each other, is giving astronomers a new tool to study the solar system's most distant planet.

Astronomers from NASA's Jet Propulsion Laboratory, the University of Hawaii, University of Arizona and the University of Texas are observing Charon as it alternately moves in front of and then behind Pluto in a rare series of eclipses that occur every 124 years or twice in each orbit of the Sun.

Each time Charon passes between Pluto and the Earth a portion of the surface of Pluto is blocked from view, resulting in a dimming of the combined light from the two bodies. And when Charon moves behind Pluto their roles are reversed. Measurements of the times, durations and changes in brightness of the events will allow astronomers to calculate the masses, diameters and densities of both Pluto and Charon.

A more accurate estimate of the density of Pluto and Charon would allow astronomers to develop models of the composition of the planet and satellite. Estimates of Pluto's density now have an uncertainty of 50%, which is

not accurate enough to derive information on its composition. Pluto's density is thought to be about that of water. That would make it the lowest-density planet known that has a solid surface.

The new measurements indicate that the combined brightness of Pluto and Charon together diminishes by 4%. The dimming lasts about two hours and is superimposed on a 30% brightness change that occurs over a 6.4-day period. The longer change in brightness happens because one hemisphere of Pluto is 30% brighter than the other.

Very little is known about Pluto and even less about Charon. No one knew, for example, when or even if the five-year-long series of eclipses would begin. (This is the first opportunity to observe the eclipse series since Pluto was discovered in February 1930.)

The first to see and measure an eclipse of Pluto by Charon were Dr. Edward Tedesco and Dr. Bonnie Buratti, of JPL, on January 16 at Palomar Observatory. On February 17, Richard P. Binzel observed another eclipse from the University of Texas' McDonald Observatory. And Dr. D.J. Tholen observed yet a third eclipse on February 20 from the Mauna Kea Observatory.

Astronomers discovered Charon in 1978. Charon's orbital motion around Pluto led the astronomers to realize that Pluto is tipped on its side in much the same way as Uranus, so that Pluto alternately points its north and then its south pole toward the Sun.

Pluto circles the Sun in a highly elliptical orbit that moves inside of Neptune's orbit and then far beyond it. It has been inside the orbit of Neptune since 1979 and will be there until 1999. Its average distance from the Sun is 6 billion kilometers (4 billion miles), almost 40 times greater than the distance of the Earth from the Sun. Pluto was discovered in February 1930 by Clyde Tombaugh at the Lowell Observatory. Charon was discovered in 1978 by James Christy at the U.S. Naval Observatory. Because it circles the Sun only once in 248 years, Pluto hasn't completed one orbit since its discovery. The great distance and relatively small sizes make Pluto and Charon among the most difficult objects to observe in the solar system.

JPL Press Release 3-8-85

EVIDENCE FOUND TO SUPPORT MINERAL ORIGIN OF LIFE ON EARTH THEORY

A discovery by NASA scientists provides additional support for an emerging theory about the origin of life on Earth. The theory is that organic life did not arise from an accidental combination of chemicals and energy in a primordial "soup" on the primitive Earth but from a combination of chemicals that were selected and combined in an orderly process found in ordinary ceramic clay.

According to the clay origin-of-life theory, organic chemicals that eventually "learned" to reproduce themselves and create life could have come together in an orderly process which first appeared in the structuring and reproductive processes attributed to clay. The NASA work that strengthens the theory is a finding that clay has the ability to absorb, store and transfer energy which is a necessary process of organic life.

The clay-energy storage and transfer processes were discovered by a group of researchers led by Dr. Lelia Coyne of San Jose State University, working at NASA's Ames Research Center, Mountain View, California.

According to the new origin-of-life theory which is attributed to A.G. Cairns-Smith of the University of Glascow, Scotland, clay minerals served as inorganic proto-organisms which were the forerunners of later organisms based on organic compounds. The revised new theory proposes that the very first proto-organisms formed at random from an array of organic raw materials. It further proposes that inorganic proto-organisms were not only precursors of organic life but also may have provided a transitional evolutionary structure for it. That is, the theory suggests that synthesis of later living organisms based on organic compounds was initially directed by an original inorganic pattern.

The NASA-Ames discovery of energy storage and transfer in clays introduces a new and important aspect to the clay-life theory—in addition to clay's long-known ability to act as a catalyst and its suggested potential for self-replication. The new evidence shows that clay minerals are capable of engaging in energetic processes which are necessary conditions if it is to be shown that clays have lifelike properties.

This current NASA-sponsored investigation with clays grows out of twenty years of research by Ames scientists in studies of the chemical basis for the origin of life. Scientists besides Coyne recently involved in various aspects of clay research at Ames include Drs. Sherwood Chang, Ted Bunch, James Lawless, Noam Lahav, David White, and Glenn Pollock.

NASA Press Release 85-48 4/2/85

GAS CLOUD SURROUNDS POSSIBLE PROTOPLANETARY SYSTEM

Observations with the International Ultraviolet Explorer (IUE) satellite have revealed what appears to be a variable cloud of gas surrounding the star Beta Pictoris, a star that many astronomers think is a leading candidate for a planetary system resembling our own. Beta Pictoris is located in the constellation Pictor in the southern hemisphere.

The IUE findings of co-existing dust and gas clouds are consistent with scientific theories of planetary system formation, according to Dr. Yoji Kondo, IUE project scientist

at the NASA Goddard Space Flight Center in Greenbelt, Md., and Dr. F.C. Bruhweiler of Catholic University, Washington, D.C., who jointly made the observations last month.

In general, theories predict that planets evolve from large stellar clouds of dust and gas which gradually condense into orbiting planetary bodies. This theoretical argument for planet formation was strengthened two years ago by observations with the IRAS, an international infrared satellite in Earth orbit, which suggested that a number of nearby stars are surrounded by planetary disks.

IRAS detected evidence of the presence of particles larger than 1 millimeter surrounding a star similar to Beta Pictoris. In October, ground observations of Beta Pictoris indicated the presence of dust particles of sizes larger than a fraction of a millimeter which could engulf possible planetary bodies. The ground observations were made from the Andes Mountains by Drs. Bradford Smith, University of Airzona, and Richard Terrile, of NASA's Jet Propulsion Laboratory, Pasadena, California, using an Image-enhanced near-infrared telescope.

Kondo and Bruhweiler used the IUE telescope to obtain the ultraviolet spectra of Beta Pictoris to determine the manner in which ultraviolet light was absorbed by the gas cloud and the extinction of the light by the dust cloud. The ultraviolet spectra showed an absence of selective extinction of the light at shorter wavelengths. This is evidence that the star's light was being blocked evenly at all wavelengths by dust particles greater than 1 micron, as reported from infrared data.

"The IUE observations," said Kondo, "indicate the gas is either clumpy or is varying under the pressure of the stellar wind and radiation. If so, this would tend to complement IRAS and ground telescopic observations that a substantial dust cloud of protoplanetary material exists around Beta Pictoris."

The existence of such a thick dust belt is supported by the work of Smith and Terrile indicating that the star's radiation is dimmed by half a magnitude due to dust obscuration.

NASA Press Release 85-52, 04-10-85.

MIDWEST SPACE DEVELOPMENT CONFERENCE

The Midwest Space Development Conference will be held at Miami University in Oxford, Ohio on September 27-29, 1985. The conference will include experts relating the current research being done in the Midwest and educators who will explore methods of effectively teaching this exciting topic. For more information write:

Midwest Space Development Conference
2720 West 40th Street
Lorain, OH 44055

COMETS AND ASTEROIDS TO BE FEATURED AT A.S.P. MEETING

A symposium on "New Directions in Asteroid and Comet Research" will highlight the 97th Annual Meeting of the Astronomical Society of the Pacific June 22-27. To be held at Northern Arizona University in Flagstaff, the meeting will also feature a series of nontechnical lectures on recent developments in astronomy, a workshop for teaching astronomy in high school and college, a session on the history of astronomy, and special tours of Meteor Crater, the Lowell Observatory, and the Grand Canyon.

A number of astronomers are expected to have first results at the meeting from observations of Comet Halley planned for Spring 1985.

For more information and a registration form, write to: Summer Meeting, A.S.P. 1290 24th Avenue, San Francisco CA 94122.

SPECIAL SESSION ON MICROGRAVITY RESEARCH

A call for papers for a session on *Experimental Methods for Microgravity Materials Science Research* has been issued. This session will be conducted at the 115th TMS-AIME Annual Meeting on March 2-6, 1986, in New Orleans, Louisiana. It is sponsored by the Thermodynamic Data Committee, Materials Science Division, American Society for Metals. The abstract deadline is August 1, 1985. For more information or to obtain abstract forms contact:

Dr. Robert Shiffman
Midwest Research Inst.
425 Volker Blvd.
Kansas City MO 64110
816-753-7600 Ext. 483

Barbara Kamperman
Technical Program Coordinator-TMS
420 Commonwealth Drive
Warrendale PA 15086
412-776-9050

EUROPEAN PLANETARY MEETINGS PLANNED

A Vulcano Scientific Meeting entitled *The Solid Bodies of the Outer Solar System* will be held in Vulcano, Italy, September 9-13, 1985. For more information contact: Angioletta Coradini, Instituto di Astrofisica Spaziale del CNR, Reparto Planetologia, Viale dell'Universita 11, 00185 Roma, Italy.

The Societa Italiana di Fisica has announced the summer schedule of courses in the International School of Physics "Enrico Fermi." *The Evolution of the Small Bodies of the Solar System* will be the topic of the 4th course, 1985 to be held August 5-10, 1985 at Villa Monastero, Varenna. For more information about the course contact: Dr. G.B. Valsecchi, Instituto di Astrofisica Spaziale del CNR, Reparto Planetologia, Viale dell'Universita 11, 00185 Roma, Italy.

1985 SUMMER INTERN PROGRAM FOR UNDERGRADUATES

The following students have been selected from this year's applicants to participate in the Summer Intern Program at the Lunar and Planetary Institute. The program, now in its ninth year, is designed to acquaint undergraduates or recent graduates to the world of research. Each intern will have a project directed by a scientist-advisor from the LPI or the Johnson Space Center. During the ten-week period, the interns will have the opportunity to attend lectures and seminars given by various scientists in the space science programs. At the end of the period, there will be a mini-conference at which each of the interns will present the results of the research they have conducted during the summer.

This year's interns, their advisors, and projects are:

Gordon P. Alexander, University of Massachusetts

ADVISOR: Dr. David Gust, Lunar and Planetary Institute

PROJECT: Granulite metamorphism depletes the lower crust in radiogenic heat-producing elements. This project investigates how this depletion occurs in a carbonate-rich fluid phase using published information on the distribution of those elements in mineral phases, and experimentally determining the stability of relevant minerals at high pressure and temperatures.

Jonathan Kenn Bareng, University of California, San Diego

ADVISOR: Dr. Pamela D. Kempton, NASA Johnson Space Center

PROJECT: The proposed research will investigate the degree of trace element modification of the mantle resulting from crystallization of veins using samples from the Trinity Peridotite, northern California. The chemical consequences of vein formation on upper mantle rocks as observed in Alpine-type peridotite massifs will be compared with available composite xenolith data from the Geronimo Volcanic Field; the implications for metasomatism via silicate melts will be addressed. Instrumental Neutron Activation Analysis (INAA) techniques will be utilized to determine the concentrations of REE and other trace elements.

Cheryl Bartels, University of Illinois

ADVISOR: Dr. Stephen Clifford, Lunar and Planetary Institute

PROJECT: Investigations by the Viking Landers revealed the presence of a crusty salt-rich near-surface layer in the Martian regolith. This material, which has been dubbed "duricrust", may play an important role in determining both the stability of Martian eolian deposits and the magnitude of volatile exchange which occurs between the planet's atmosphere and regolith. Based on our current understanding of the chemical and physical properties of the Martian duricrust, as well as the origin of analogous salt-rich layers on Earth, we will attempt to construct a detailed numerical model to study the development and subsequent evolution of a duricrust layer.

James M. Brenan, McGill University

ADVISOR: Dr. Friedrich Hörz, NASA Johnson Space Center

PROJECT: The total amount of impact melt generated during planetary hypervelocity impact is predominantly based on cratering theory, which in turn very heavily relies on thermo-dynamics and resulting interpretations of measured or modelled (= extrapolated) equations of state. A comparison between theory and experiment regarding the outset of melting (= partial melting) and "whole rock" melting is planned. Petrographic thin sections will be analysed for total melt content, in part aided by image processing techniques. The final product will be a % melt versus shock-pressure curve for a number of granitic rocks.

Andrew Steven Bury, University of California, Santa Barbara

ADVISOR: Dr. Peter Francis, Lunar and Planetary Institute and Dr. Charles Wood, NASA Johnson Space Center

PROJECT: The title of this project is "Volcano Census of the Central Andes." Photographs taken by Shuttle astronauts and Landsat will be used to compile a complete inventory of all major volcanoes in the Central Andes. Volcano location, type, size, erosional state, inferred eruption styles, and other characteristics will be determined from examination of the photos, and this information will be combined with geochemical and geochronological data taken from published reports. This exhaustive compilation, the most complete survey of any volcanic arc, should shed light on the eruptive history, relation between vents, and magma processes at a poorly-known segment of the Ring of Fire.

Debra C. Colodner, Yale University

ADVISOR: Dr. Gordon McKay, NASA Johnson Space Center

PROJECT: The project will involve petrographic and electron microprobe analysis of shergottite meteorites. One aspect of the project will be a detailed study of major element zoning in mafic minerals. This will involve performing many major element microprobe analyses. The results will be plotted using an IBM-PC. The second aspect of the project will involve adapting microprobe techniques which have been developed for trace element analyses of experimental charges to natural samples, and applying them to analyze one or more trace elements in shergottite mafic minerals. This will require special consideration of detection limits and interferences in light of expected natural abundances, and will also involve extensive use of the IBM-PC.

Claire Devine Duncan, Stanford University

ADVISOR: Dr. Charles Wood, NASA Johnson Space Center

PROJECT: The largest volcanic eruptions, spewing out thousands of km^3 of material, occur in complexes of ashflow calderas, such as the San Juan volcanic field in Colorado. Many geologists have investigated the geochemistry of the ashflow deposits, and have mapped various source calderas. In this summer's project a comparison of several of these large ashflow volcano fields will be undertaken to search for trends to illuminate the entire process of ashflow volcanism. Data from published literature, maps, and Space Shuttle and Landsat photographs will be synthesized to investigate relations between volcano field size, lifetime, compositional diversity, and vent size and number.

Laurel Kaczor, Beloit College

ADVISOR: Dr. Michael Zolensky, NASA Johnson Space Center

PROJECT: Perform semi-quantitative chemical analyses of a statistically significant fraction of the complete particle load of a single cosmic dust collection surface. These analyses will be performed using SEM with an EDX attachment. The results of these analyses will then be entered into the complete cosmic dust computer data base. Comparison with earlier such studies will permit us to evaluate possible recent changes in the particle population and micrometeorite number density of the stratosphere. An attempt will also be made to identify the sources of this material.

Rachel M. Lerner, Boston University

ADVISOR: Dr. Lewis Ashwal, Lunar and Planetary Institute

PROJECT: The project involves microthermometric (heating/freezing microscope stage) characterization of fluid inclusions in Proterozoic granitic rocks associated with Labrador anorthosites. Last year's work confirmed the presence of CO_2 in unmetamorphosed, anhydrous granites, suggesting that carbonic fluid may play a primary role in the formation of some granites. This year's work would continue and expand the data base, particularly on a sample in which possible primary igneous carbonate has been identified. The project bears on the nature and role of volatiles in crustal processes, especially granite petrogenesis.

Laurie Ann Leshin, Arizona State University

ADVISOR: Dr. James Zimbelman, Lunar and Planetary Institute

PROJECT: This project, "Analysis of Infrared Data from Equatorial Latitudes on Mars," involves the reduction and analysis of infrared temperature measurements of Mars obtained from the Viking Infrared Thermal Mappers. The data will be processed into an image format for comparison with maps and photographs of the planet. This procedure allows the thermal properties to be related to specific surface features, aiding in the interpretation of the geologic history of the region. The project work will concentrate on the Elysium and Aeolis Quadrangles.

Martin Ellis Lieurance, University of California, Los Angeles

ADVISOR: Dr. David McKay, NASA Johnson Space Center

PROJECT: We have material from Solar Max spacecraft which was exposed in space for four years and then returned to earth. We have already found hundreds of craters in this material and now need to analyze some of these craters in detail on the scanning electron microscope. Some of these craters contain fragments of micrometeorites. The intern will be assigned several craters to analyze in detail by photography and by energy dispersive x-ray analysis in order to find and document any micrometeorite residue within. This is a very important project because the Solar Max craters have yielded the first recorded case of unlimited micrometeorites captured in space. We expect that some of the unanalyzed craters will contain additional unmelted micrometeorites and the nature and composition of this material is of major scientific importance.

Glenn M. May, Buffalo State College

ADVISOR: Dr. Bruce Bills, Lunar and Planetary Institute

PROJECT: Bonneville was the largest of the Pleistocene lakes in the Great Basin (Utah and Nevada). The well-preserved shorelines record significant uplift (~70 m) in the center of the lake, relative to the periphery. Previous studies of the region have assumed that the surface water in the lake constituted the entire load, and have consistently found the deformational response to be anisotropic (contrary to expectation). The present study will consist of four parts: (1) use of remote sensing data (Landsat and Heat Capacity Mapping Mission images) to delineate and map shoreline features around the entire lake, (2) compile information on the regional aquifers and the present extent of groundwater in the region, (3) using the known extent of the lake as a function of time, estimate the concomitant fluctuations in groundwater, and (4) using the combined variations in surface water and groundwater as the total load, compare the computed shoreline deflection (for a variety of lithospheric models) with the observed, in a attempt to better understand the response of the lithosphere to loads of relatively short duration (10-20 thousand years).

Eric B. Rehwoldt, University of California, Los Angeles

ADVISOR: Dr. Everett Gibson, NASA Johnson Space Center

PROJECT: Petrographic examination of suites of Archean sediments of differing ages will be undertaken in

hopes of identifying primary fluid inclusion. After characterization of the fluid inclusions using microthermometry techniques, selected sample fluids will be analyzed using the laser microprobe/gas analysis techniques. The study will provide information about the nature of volatiles present in the Archean.

JULY 16-24 SLATED FOR SPACEWEEK '85

More than a quarter of a million enthusiasts in 100 cities will celebrate Spaceweek '85 July 16-24, marking the sixteenth anniversary of the first flight to the Moon by U.S. astronauts.

Spaceweek, launched in 1980, brings together business, government, education, and space buffs in an annual salute to America's quarter-century adventure exploring the high frontier.

Local chapters coast-to-coast rally support for the U.S. space program by organizing cultural, scientific, educational and entertainment events. These events range from telescope "star parties" and space-art contests to media appearances by space experts and model-rocket launches.

Spaceweek National Headquarters, founded in Hoston in 1981, is a non-profit volunteer group that guides space enthusiasts in mapping out Spaceweek programs. Individuals and groups interested in sponsoring and organizing Spaceweek events should write:

Spaceweek National Headquarters
P.O. Box 58172
Houston TX 77258

For information about obtaining Spaceweek proclamations from state and local leaders, contact: Ken Randle, 1753 Mill Creek Circle, Salt Lake City, UT 84106.

SUMMARY OF MECA "DUST ON MARS" WORKSHOP

S. Lee and P. Christensen, Organizers

A MECA workshop, "Dust on Mars," was sponsored by NASA through the Lunar and Planetary Institute and hosted by Arizona State University on February 4-5, 1985. The goal of the workshop was to stimulate and coordinate research on the properties of martian dust, its distribution on the planet, and the processes affecting its yearly deposition, erosion, and transport.

Each of the eight participants led a discussion related to an aspect of his current research related to martian dust: P. Christensen presented evidence, based on IRTM data, for regional dust deposits on Mars; R. Greeley discussed mechanisms for dust-raising on Mars; B. Jakosky discussed remote sensing evidence for global duricrust on Mars and a theoretical study of the relationship between particle size, thermal inertia, and conductivity; S. Lee outlined observations of rapid redistribution of dust on the Tharsis volcanoes; A. Peterfreund described IRTM studies of local dust storms and global opacity; P. Thomas reported on evidence for dust devils on Mars, photometry of wind streaks, and the possibility of multi-component martian dust; J. Zimbelman presented results of his research into the surface properties of Ascraeus Mons and evidence for dust deposits on this volcano; and R. Zurek discussed the ability of planetary-scale circulation models (including stationary and tidal models) to predict the strength and pattern of surface winds.

Questions raised or left unanswered by the research completed to date were discussed. Several experimental, observational, and theoretical research projects were defined to be completed both jointly and individually by the participants over the course of the next year. These projects relate to the questions:

1) How many components of dust are there on Mars?

2) How is dust ejected from the surface into the atmosphere?

3) How do the sources and sinks of dust vary with time?

Proposed projects to address these questions fall within the scope of on-going research by the individuals involved. In addition, several specific areas of Mars were chosen for detailed study: Tharsis (in particular Arsia and Ascraeus Mons), Solis Planum, Syrtis Major/Arabia, and the complex deposits and streaks in and around Petit Crater.

A second workshop will be held in about one year to report on the results of the projects outlined above. Recognizing the interest by the planetary sciences community concerning the "martian dust cycle," the workshop participants recommend that a MECA topical conference on this subject be organized early next year to encourage participation by the entire community.

The workshop attendees would like to encourage the participation in "dust-related" research by others in the community. One way of achieving this aim is to assemble a collection of papers on the subject. *Icarus* has agreed to publish such contributions in a single issue next year. All manuscripts will, of couse, be subject to the usual *Icarus* review process, and should be submitted in their standard format.

If any of your current research concerns martian dust or related processes and is nearing the publication stage, you are encouraged to submit a manuscript for this issue. The deadline for receipt by *Icarus* will be July 1, 1985. Please request that your contribution be considered for the "Dust on Mars" issue, and submit four copies of the manuscript to:

Dr. Joseph A. Burns
Space Sciences Building
Cornell University
Ithaca, NY 14853

If you intend to submit a paper, please call Steven W. Lee at 602-965-7037.

R&D PRODUCTIVITY:
NEW CHALLENGES FOR THE U.S. SPACE PROGRAM

A call for papers for this conference has been issued. The Conference will be held September 10-11, 1985 in the combined facilities of the University of Houston-Clear Lake and the Lyndon B. Johnson Space Center.

With the age of Space Transportation upon us and the future of Space Station close at hand, the need to understand and improve R&D productivity is even more acute. This Conference hopes to build upon the solid base of past and present successes to point the direction for future accomplishments.

Abstracts are invited which concentrate on the application of productivity improvement techniques and measures at the operations level. Submissions should focus on one of four basic topic areas: Decision Processes, Human Dynamics, Hardware, and Hardware/Human Interface. Abstracts should be targeted for one of the following parrallel tracks: Management Issues in high technology; STS Operations; Space Station Development.

All submissions and inquiries should be directed to:

Otis W. Baskin, Director
Center for Advanced Management Programs
University of Houston-Clear Lake
Houston TX 77058
Phone: 713-488-9533

JSC Announcement 85-49, 4/17/85

MECA WORKSHOP ON THE EVOLUTION OF THE MARTIAN ATMOSPHERE

Michael Carr and Phillip James

A workshop on "The Evolution of the Martian Atmosphere" will be held in conjuction with the IAMAP/IAPSO Joint Assembly (International Association of Meteorology and Atmospheric Physics/International Association for the Physical Sciences of the Ocean) in Honolulu August 9-10, 1985. The purpose of the workshop is to examine different aspects of the formation and evolution of the martian atmosphere. Several lines of evidence suggest that the early martian atmosphere might have been different from the present one. This workshop will examine the strength of this evidence and discuss possible characteristics of former atmospheres and climate. A summary of the workshop will be presented to the IAMAP/IAPSO sessions on "Comparative Climatology and the Terrestrial Planets," August 13-14. The Conveners of the workshop are Michael Carr, Conway Leovy and Robert Pepin.

The workshop will be divided into three successive sessions. The first session will be on the inventory of volatiles on the surface. Different models for planet formation and outgassing, that lead to an assessment of the current and past volatile inventories, will be discussed. The intent is to examine competing models to determine where improvements of reconciliations might be achieved and to assess to what extent theories of the climatic history of the planet should be constrained by the models.

The second session will be devoted to assessing the evidence for long term climate change. The evidence is primarily from the isotopics of the atmosphere, from consideration of potential effects of astronomic perturbations, and from the characteristics of the surface, particularly the presence of channels and valleys. These areas will be examined to determine the magnitude of the climate changes that are implied by each.

The third session will examine possible characteristics of former atmospheres. How would thicker and possibly chemically different atmospheres react with the surface? How extensive would the ice caps be? Would thicker atmospheres result in perpetual dust storms? What would be the dynamical behavior of a thick, dust-laden atmosphere? One purpose of this session would be to assess what evidence might survive of former, distinctively different, climatic conditions, and how this evidence could be recognized.

The workshop is planned to encourage interaction between participants. Each session will have 2-3 summary talks and a small number of shorter presentations. Presentation time will be restricted to allow ample time for discussion. The workshop will be limited to 40 participants.

If there is sufficient interest, a special issue of *Icarus* devoted to the ICPAE Symposium "Comparative Climatology of the Terrestrial Planets" is planned. Since this symposium includes byway of review the MECA Workshop on Martian Atmosphere, those MECA members who contemplate writing manuscripts relevant to these topics should consider submitting their papers to *Icarus* for this special issue. Papers submitted should be papers of quality which describe completed research. They will be handled as usual *Icarus* submissions in the sense that they will be reviewed by at least two referees.

GEOSAT WORKSHOP

The 5th Geosat state-of-the-art Flagstaff Workshop, *Earth Remote Sensing Research and Development: Requirements and Responsibilities*, will be held September 23-27, 1985, at Little America, Flagstaff, Arizona, under Co-Chairmen Drs. G. Bryan Balley, USGS/EDC, and Frederick B. Henderson III, The Geosat Committee. Subjects to be covered include Current Status, Sensor R&D, Applications R&D, Data Systems R&D, R&D Funding (government/academia/industry/joint), and Education and Training. A plenary session will follow. information is available through the Geosat Committee, 153 Kearny, Suite 209, San Francisco CA 94108; Phone 415/981-6265. Early registration is urged.

WORKSHOP ON APOLLO 15

The Lunar and Planetary Institute will sponsor a topical workshop on the geology of the Apollo 15 landing site in November 1985, at the LPI in Houston. Specific dates have not been set, but the three-day workshop will probably be held sometime during the week of November 11 or November 18, 1985.

The workshop will encompass all fields pertaining to the geology of the Apollo 15 landing site. Among the topics to be discussed are:

Formation and evolution of the Imbrium impact basin
Petrology of the Apennines
KREEP and mare volcanic processes
Geology and impact mechanics of craters
Regolith evolution
Stratigraphy of the site on a regional and local level.

Participation by all workers in petrology, geochemistry, geophysics, geology, cratering mechanics, and remote-sensing is encouraged.

The conveners of the workshop are Paul Spudis (U.S. Geological Survey-Flagstaff, Arizona) and Graham Ryder (Lunar and Planetary Institute). The organizing committee will meet in early June 1985 at the LPI. Anyone wishing to comment on the scope, format, or organization of the workshop is urged to make suggestions to the conveners before this time. For more information, contact: Pam Jones, LPI, 3303 NASA Road One, Houston TX 77058. Phone: 713-486-2150.

WORKSHOP ON SPACE STATION PLANETOLOGY EXPERIMENTS (SSPEX)

Following the initiative to establish a manned Space Station in Earth orbit by the mid-1990's, numerous studies have been undertaken to identify the potential science activities that could be conducted in the environment afforded by an Earth-orbiting Space Station.

This workshop will address the possibility of using the space station as an environment for carrying out experiments. Some of the general experiment areas that have been suggested include impact cratering, experimental petrology, and the formation and interaction of small particles (e.g. planetary ring dynamics). This workshop will provide a forum to discuss the full range of possible experiments, their science rationale, and the requirements on the Space Station, should such experiments eventually be flown.

The workshop, sponsored by NASA through the Lunar and Planetary Institute and Arizona State University, is open to all interested scientists. Dates for the workshop are June 20-22, 1985. This is just prior to the Astronomical Society of the Pacific Symposium on Comets and Asteroids to be held in Flagstaff, June 25-27.

For more information please contact: Dr. Ronald Greeley, Dept. of Geology, Arizona State University, Tempe, AZ 85287.

NEW PUBLICATIONS

Some of the following publications are available from the Superintendent of Documents, Government Printing Office, Washington DC 20402. Although this agency requires prepayment on all orders, they will accept Mastercard or VISA credit cards. Just include the account number and expiration date on your order to them. Some of the publications may be available from the GPO bookstores which are found in major cities around the U.S. Check your city directory for a local listing.

Several of the GPO publications are being offered by other distributors at widely varying prices. It pays to shop and compare.

Some of the NASA documents cited here are only available from the National Technical Information Service, Springfield VA 22161. This agency also requires prepayment. It should also be noted that the paper copy supplied by this agency is often a photocopy produced from a microfilm. Consequently quality is not always consistent.

PLEASE do not send orders for these publications to the LPI. We are not a distribution center for SOD or NTIS documents and this will only delay your order.

The Geology of the Terrestrial Planets

This book, co-authored by M.H. Carr, R.S. Saunders, R.G. Strom, and D.E. Wilhelms, should be a useful text for the comparative study of geology on the terrestrial planets. The basic characteristics of Mercury, Venus, Earth, Moon, and Mars are presented in a format well suited for examination of the similarities and differences between these planetary bodies. The chapters are generally well organized, aiding in the location of information on particular subjects, and they are thoroughly illustrated with good reproductions of both photographs and diagrams. The text emphasizes descriptions of individual geologic features and terrains and is extensively referenced.

The first chapter provides a brief description of the solar system and some of the methods used in making geologic interpretations from spacecraft data. This is followed by a discussion of asteroids, comets, meteorites, and planet formation. It is unfortunate that asteroids and comets are covered in only four paragraphs of text. The chapter about Mercury elaborates on the distinctive features and surface units identified in the Mariner 10 photographs and the unusual internal structure of the planet inferred from both geological and geophysical results. The Venus chapter is relatively short due to the lack of detailed information about surface features. The Venera 15/16 radar images should eventually improve this situation. The general properties of Earth are summarized next, with emphasis on the Archean crust and on plate tectonics. The chapter dealing with the Moon provides an excellent review of geologic interpretations made from spacecraft data and how they correlate with the results obtained from the six Apollo landing sites. This chapter concludes with four color plates illustrating the spatial distribution and stratigraphic sequence of geologic terrains at various periods of lunar history. The Mars chapter outlines the numerous features and geologic terrains and presents a reasonable summarization of Carr's book, *The Surface of Mars*. A 5-page Summary chapter compares and contrasts impact cratering, volcanism, tectonism, and wind/water/surface interactions on the five planetary bodies.

The book does not present major new concepts or hypotheses but it is quite thorough in summarizing results reported up through 1982. Its major advantage is the compilation of a vast amount of information on the geologic history of the terrestrial planets in a single well-organized volume. Both students and professionals involved in planetary geology would find this book a useful resource.

NASA SP-469, 317 p., 1984. Available from the GPO as S/N 033-000-00900-3 for $16.00. Hard cover.

—Jim Zimbelman

Planetary Geology in the 1980s

This is the third document in a chronological series whose objective is to define the major goals of planetary geology and to set forth methods of meeting these goals. This report defines the kinds of experiments, observations, and measurements that need to be made by Earth-based, Earth-orbit, and spacecraft exploration techniques to address major issues of concern to planetary geology. It also discusses important goals of data analysis and data synthesis in the area of planetary geology.

The document was written by the Planetary Geology Working Group during the early 1980's. It has been edited by Joseph Veverka.

NASA SP-467, 187 p., 1985. For sale by the National Technical Information Service $17.50 U.S., $35.00 Foreign.

Uranus and Neptune

This volume contains the papers presented to a workshop sponsored by the Voyager project. The principal goal of the workshop was to establish a scientific framework within which to plan the Voyager encounters with Uranus and Neptune. Nearly thirty invited papers summarize the current state of knowledge of Uranus and Neptune, their atmospheres, their magnetospheres, and their respective systems of satellites and rings (if any). The workshop was held February 6 through 8, 1984, in Pasadena California. Edited by Jay T. Bergstralh.

NASA CP-2330, 636 p., 1984. For sale by the National Technical Information Service, cost approximately $45.00 U.S.; $80 Foreign.

MORE NEW ITEMS FROM ASP

The Astronomical Society of the Pacific has announced a number of new products which are available at nominal price in their continuing mission to provide good educational materials in astronomy. Among these are:

Halley's Comet Information Packet

This nontechnical information packet about the return of Halley's Comet in 1985 and 1986 contains a 34-page pamphlet designed to prepare the average person for finding, viewing, and understanding the most famous of all comets as it makes its once-every-76-year journey into the inner solar system. Unfortunately, during this pass, Halley's Comet is expected to be quite dim and may be difficult to see from most urban areas in the U.S. Thus the packet includes helpful finding charts, detailed schedules, and clear instructions to help locate the comet, as well as introductory articles about comet science and comet lore, a thorough reading list, and an introduction to astronomy as a hobby.

To obtain a copy of the packet, send a donation of $4.00 with your name and address to A.S.P., Comet Packet Dept., 1290 24th Ave., San Francisco, CA 94122.

New Solar System Slides

A new set of 30 recent solar system images assembled by Dr. David Morrison of the University of Hawaii is now available. The third in a series of slide collections entitled *The Solar System Close-Up*, the set is designed to help teachers, students, and astronomy buffs show the awesome and complex geological and astronomical features of the other worlds in our home system. The images in the new set include fine-scale radar "photographs" of the surface of Venus taken by recent Soviet space probes, remarkably detailed views of the landscape on Mars (in which features as small as 20 meters across can be seen), new computer-processed color images of Jupiter's moons

Io and Europa, and clear comparative diagrams of selected solar system objects.

The set is accompanied by a booklet of detailed captions explaining the significance of each view in non-technical language and a bibliography for further study of the solar system.

The slide set is $24.95 (including postage and handling. Send orders to A.S.P. Solar System Slides, address as above.

New Slide Set on Telescopes

This set of 50 color slides illustrates the largest and most important telescopes around the world. It has been produced by A.S.P. with the help of dozens of astronomers and observatory directors. The set offers dramatic views of light and radio telescopes in the U.S., Australia, the U.S.S.R. and other countries, as well as some of the most significant telescopes in orbit around the Earth.

Included in the set are photographs of the giant Russian reflector (the largest light-gathering telescope in the world), the Very Large Array of radio telescopes in New Mexico, the Kuiper Airborne Observatory, the large telescopes on top of the extinct volcano called Mauna Kea in Hawaii and dozens of others. The set is accompanied by a 32-page booklet giving an introduction to astronomical telescopes for the novice, a detailed description of each telescope shown, and comparative tables of the characteristics of the world's largest astronomical instruments.

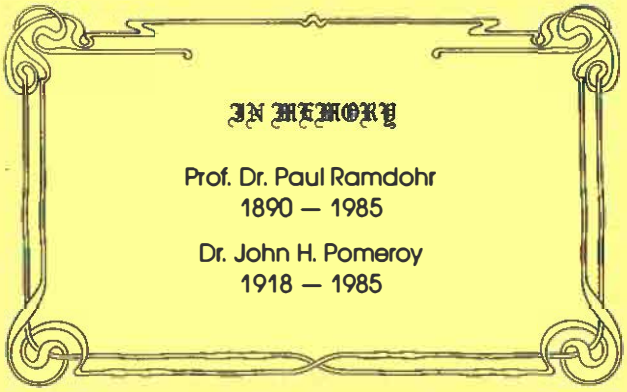
The slide set is $40.95 (including postage and handling). Send orders to A.S.P. Telescope Slides, address as above.

The Heavens on Tape

To help comet buffs and others who would like to know the night sky better, the Astronomical Society of the Pacific has developed two cassette tapes providing guided tours of the heavens for each of the four seasons.

Narrated by astronomy instructor and radio commentator Tom Gates, each 25 minute tour contains clear, non-technical information and observing hints to help you find your way in the sky. Pauses are built in after each instruction to give the listener time to get oriented. The tapes were field tested both in a planetarium and outdoors and are accompanied by a full transcript, four specially designed seasonal star maps, and a finding chart for Halley's Comet.

The full kit of tapes, transcripts and maps is available for $14.95 plus $2.00 for postage and handling. Write to A.S.P. Tapes Dept., same address as above.



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(ye editor)

The LUNAR AND PLANETARY INFORMATION BULLETIN is published by the Lunar and Planetary Institute. There are usually three 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 NOVEMBER. Copy deadline is OCTOBER 18, 1985. 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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Lunar and Planetary Institute
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Phone: 713/486-2135

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calendar

May 8-11	**Princeton/AIAA/SSI 7th Conference on Space Manufacturing,,** Princeton University, New Jersey.	B.A. Lehman, Space Studies Institute, P.O. Box 82, Princeton NJ 08542.
May 27-31	**American Geophysical Union Spring Meeting,** Baltimore, Maryland.	AGU, 2000 Florida NW, Washington DC 20009.
June 2-6	**166th Meeting American Astronomical Society,** Charlottesville Virginia.	Laurence Fredrick, Leander McCormick Observatory, University of Virginia, P. O. Box 3818, University Station, Charlottesville VA 22903-0818. 804-924-4905
June 5-7	**Conference on Terrestrial Planets: Comparative Planetology,** Ramo Auditorium, California Institute of Technology, Pasadena California.	David J. Stevenson, Division of Geological and Planetary Sciences, Caltech 170-25, Pasadena CA 91125. 818-356-6534
June 7	**Abstract Deadline - GSA Annual Meeting**	GSA, P.O. Box 9140, Boulder CO 80301. 303-447-8850
June 19-30	**Workshop on the Earth's Oldest Rocks,** and Field trip, Greenland.	Projects Office, LPI, 713-486-2150
June 20-22	**Workshop on Space Station Planetology Experiments (SSPEX),** Flagstaff, Arizona.	Ronald Greeley, Department of Geology, Arizona State University, Tempe AZ 85287
June 22-27	**Astronomical Society of the Pacific 97th Annual Meeting ,** Northern Arizona University, Flagstaff, Arizona.	A.S.P., 1290 24th Avenue, San Francisco CA 94122
July 11-13	**International Workshop on Antarctic Meteorites** Mainz, Germany.	Ludolf Schultz, MPI fur Chemie, Saarstrasse 23, D-6500 Mainz, F.R. Germany. OR John O. Annexstad, Code SN2, NASA/Johnson Space Center, Houston TX 77058 USA

July 16-19	**48th Annual Meeting - Meteoritical Society** Bordeaux, France.	G. Simonoff, Universite de Bordeaux I, C.E.N.B.G., Le Haut-Vigneau, 33170 Gradignan, France.
July 16-24	**Spaceweek '85**, national celebration.	Spaceweek National Headquarters, P.O. Box 58172, Houston, Texas.
August 5-9	**Microbeam Analysis Techniques in the Study of Lunar, Meteorite, and Cosmic Dust Samples**, Louisville, Kentucky.	John Armstrong, Caltech, Geology Department, Pasadena, CA 91125. 818-356-6253, 6139.
August 5-10	**International School of Physics "Enrico Fermi" Evolution of the Small Bodies of the Solar System**, Villa Monastero, Varenna, Italy.	Dr. G.B. Valsecchi, Instituto di Astrofisica Spaziale del CNR, Reparto Planetologia, Viale dell'Universita 11, 00185 Roma, Italy.
August 5-16	**IAMAP/IAPSO Joint Assembly**, Honolulu, Hawaii.	American Geophysical Union, 2000 Florida Avenue NW, Washington DC 20009. 202-462-6903.
August 9-10	**MECA Workshop on Evolution of the Martian Atmosphere** Honolulu, Hawaii.	LeBecca Turner, Lunar and Planetary Institute, 3303 NASA Road 1, Houston TX 77058. 713-486-2158
September 9-13	**Solid Bodies of the Outer Solar System**, Vulcano, Italy.	Angioletta Coradini, Instituto di Astrofisica Spaziale del CNR, Reparto Planetologia, Viale dell'Universita 11, 00185 Roma, Italy.
September 10-11	**R&D Productivity: New Challenges for the U.S. Space Program**, University of Houston-Clear Lake and NASA Johnson Space Center, Houston, Texas.	Otis W. Baskin, Director, Center for Advanced Management Programs, University of Houston-Clear Lake, Houston, TX 77058. 713-488-9533
September 16-21	**IAVCEI Scientific Assembly, Potassic Volcanism**, Mt. Etna Volcano, Giardina, Nexos, Italy.	1985 IAVCEI Assembly, c/o EGA Congress, Piazza Trento, 2, 95128 Cantania, Italy
September 23-27	**Earth Remote Sensing Research and Development: Requirements and Responsibilities**, Flagstaff, Arizona.	Geosat Committee, 153 Kearny, Suite 209, San Francisco CA 94108. 415-981-6265

September 27-29	**Midwest Space Development Conference**, Miami University, Oxford, Ohio.	Midwest Space Development Conference, 2720 West 40th Street, Lorain, Ohio 44055
October 10-12	**Conference on Heat and Detachment in Crustal Extension on Continents and Planets**, Sedona, Arizona.	LPI, Projects Office, 713-486-2150.
October 28-31	**Geological Society of America Annual Meeting**, Orlando, Florida.	Geological Society of America, P.O. Box 9140, Boulder, CO 80301. 303-447-2020.
October 29-November 1	**Division for Planetary Sciences, American Astronomical Society**, Baltimore, Maryland.	Paul Feldman, Physics Dept., John Hopkins University, Baltimore, MD 21218. 301-338-7339
November (Date not yet set)	**Workshop on Apollo 15**, Lunar and Planetary Institute, Houston, Texas	Pam Jones, Lunar and Planetary Institute, 3303 NASA Road One, Houston TX. 713-486-2150.

1986

January 5-9	**American Astronomical Society, 167th Meeting**, Houston, Texas	Robert Haymes, Space Physics and Astronomy Dept., Rice University, P. O. Box 1892, Houston TX 77251. 713-527-4056.
February 1-9	**International Volcanological Congress** Auckland-Hamilton-Rotorua, New Zealand.	Dr. J.A. Gamble, Dept. of Geology, Victoria University of Wellington, Private Bag, Wellington, New Zealand.
March 2-6	**TMS-AIME Annual Meeting "Experimental Methods for Microgravity Materials Science Research"**, New Orleans, Louisiana.	Barbara Kamperman, Technical Program Coordinator-TMS, 420 Commonwealth Drive, Warrendale PA 15086. 412-776-9050.
May 19-23	**American Geophysical Union, Spring Meeting**, Baltimore, Maryland.	American Geophysical Union, 2000 Florida Avenue NW, Washington DC 20009. 202-462-6903.

June 1-6	Third International Conference on Geoscience Information, Adelaide, South Australia.	The Secretary, Third ICGI, Australian Mineral Foundation, Private Bag 97, Glenside, South Australia 5065, Australia.
June 30-July 4	Sixth International Conference on Geochronology, Cosmochronology and Isotope Geology, Cambridge, England.	Organising Committe, 6th International Conference, Dept.of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, England.
October 27-31	20th ESLAB Symposium on the Exploration of Halley's Comet, Heidelberg, West Germany.	Dr. R. Reinhard, Space Science Dept. of ESA, ESTEC, Postbus 299, 2200 AG Noordwijk, The Netherlands.

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NOTE: With this issue, the subject categories have been slightly changed. All of the references to the Moon are in one listing. Satellites of the planets have been separated from the planet as a whole. We hope this change will help our users find the references in which they are most interested.

MOON

BALDWIN,R.B. (OLIVER MACHINERY CO., 1025 CLANCY AVENUE, NORTH EAST, GRAND RAPIDS, MI 49503): RELATIVE AND ABSOLUTE AGES OF INDIVIDUAL CRATERS AND THE RATE OF INFALLS ON THE MOON IN THE POST-IMBRIUM PERIOD
ICARUS VOL. 61, 63-91 (1985)

BINDER,A.B. (NASA JOHNSON SPACE CENTER, HOUSTON, TX 77058): THE DEPTHS OF THE MARE BASALT SOURCE REGION
PROCEEDINGS OF THE FIFTEENTH LUNAR AND PLANETARY SCIENCE CONFERENCE, PART 2 JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 90, SUPPLEMENT, PAGES C396-C404 FEBRUARY 15, 1985 (1985)

CASHORE,J. + WORONOW,A. (DEPT. OF GEOSCIENCES, UNIV. OF HOUSTON, HOUSTON, TX 77004): A NEW MONTE CARLO MODEL OF LUNAR MEGAREGOLITH DEVELOPMENT
PROCEEDINGS OF THE FIFTEENTH LUNAR AND PLANETARY SCIENCE CONFERENCE, PART 2 JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 90, SUPPLEMENT, PAGES C811-C815 FEBRUARY 15, 1985 (1985)

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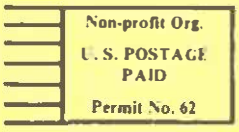

ADDRESS CORRECTION REQUESTED

U.S. GOVERNMENT PRINTING OFFICE: 1985—569-014/20405