USRA

lunar & planetary information bulletin

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Get Ready for the "XVth"

The FIFTEENTH LUNAR AND PLANETARY SCIENCE CONFERENCE will be held at the Johnson Space Center, Houston, TX, March 12-16, 1984, under the sponsorship of the Lunar and Planetary Institute, NASA-Johnson Space Center, the American Geophysical Union, the Meteoritical Society, and the Division for Planetary Sciences of the American Astronomical Society. Co-chairmen of the Conference are Dr. Michael Duke, JSC, and Dr. Kevin Burke, LPI. Scientists in all lunar and planetary programs are invited to submit abstracts and to participate in the conference.

The Lunar and Planetary Science Conference continues to be the key annual conference in planetary science, bringing together a broad group of specialists in petrology, geochemistry, geophysics, geology and astronomy.

PROGRAM: There will be no more than three concurrent sessions. Nine half-days will be devoted to presentations of research papers in topical symposia and in problem-oriented sessions. Two half-day sessions will be set aside for plenary sessions of broad interest. Some evenings will be set aside for special sessions. These sessions may be impromptu or may be devised and structured by members of the Lunar and Planetary Science community as desired. These sessions will not be considered part of the formal program.

Poster sessions will be available as an alternative to oral presentations. Requests for display space must be supported by informative abstracts. The program committee will employ the same criteria to govern allocation of space in poster sessions as for oral presentations.

ABSTRACTS: Abstracts of papers submitted to the conference will be published in *Lunar and Planetary Science XV*.

Abstract volumes will be available only to registrants at the Conference. Copies of the Abstracts remaining after the conference will be available for a small handling charge plus postage. Watch the February LPIB for order form and price list.

CONFERENCE FEE: A minimal fee will be assessed each participant to cover various conference services. Information regarding fees and pre-registration will be included in the second announcement.

The first announcement of the Conference has been sent to a portion of the LPI mailing list. Abstract forms and additional information about the Conference will be sent only to those who complete and return the "indication of interest" form that was included in the mailing. If you do not receive the FIRST ANNOUNCEMENT and wish to receive subsequent mailings about the conference please fill out and return the "indication of interest" form that is included in this BULLETIN or contact the Projects Office at the LPI (713-486-2150).

The following schedule lists dates important to the submission of abstracts, to attendance at the conference, and to the submission of papers for the Proceedings.

November 16, 1983
Abstract forms mailed to respondents

January 9, 1984
Deadline for submission of abstracts

March 12-16, 1984
Fourteenth Lunar and Planetary Science Conference

April 16, 1984
Deadline for submission of papers to the XIVth Proceedings

HOTELS: Conference participants are reminded that it is their responsibility to make all hotel and travel reservations. It is strongly recommended that you make your reservations NOW. Information on rates, addresses, and telephone numbers of local hotels are included in the FIRST ANNOUNCEMENT.

The February issue of this BULLETIN will contain the preliminary program for the conference and additional information.

REMEMBER! YOU MUST RETURN THE FORM SENT TO YOU WITH THE FIRST ANNOUNCEMENT TO RECEIVE ANY SUBSEQUENT MAILINGS!

Kevin Burke Appointed LPI Director

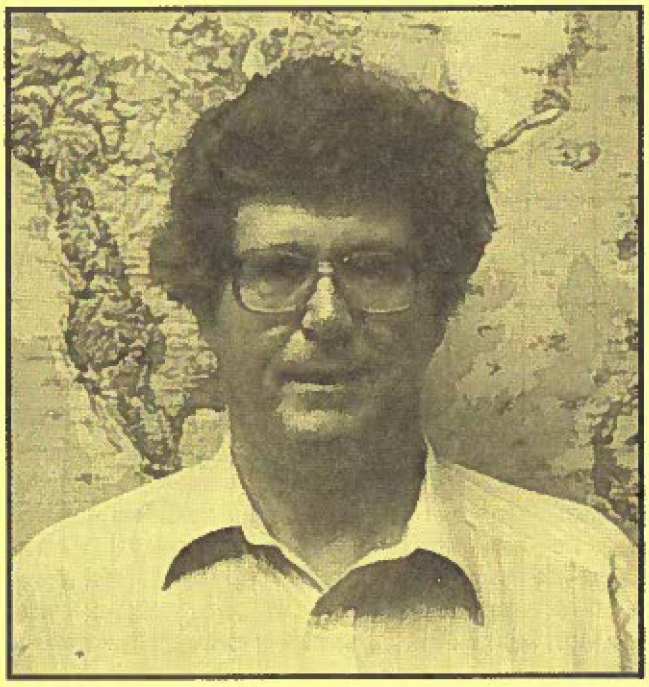
Kevin Burke has accepted the appointment of the USRA Board of Trustees to become Director of the Lunar and Planetary Institute. Burke has been Professor of Geology at the State University of New York at Albany. In addition to serving as LPI Director, he will hold a tenured appointment as Professor of Geosciences at the University of Houston. Burke, who succeeds Roger Phillips, assumed his directorship on 1 September 1983.

Burke received his Ph.D. from the University of London in 1953. His thirty years of geological experience literally span the globe. Before assuming the chairmanship of the Department of Geological Sciences at the State University of New York at Albany in 1973, Burke served in academic and government positions in Ghana, Ireland, Great Britain, Republic of Korea, Jamaica, Nigeria, and Canada.

Burke has written more than 100 articles on various topics in regional and structural geology. His primary research interest is in the application of the findings of plate tectonics to the interpretation of the geological history of the earth.

Planetary Research Fund (PRF)

A research fund of anonymous donations has been established at the LPI. The fund, directed by Peter Schultz, Senior Staff Scientist at the LPI, is earmarked principally for supporting undergraduate and graduate research at the LPI. Although the fund is presently small, it is hoped that continued donations will make it possible for the fund to provide stimulus for budding planetary scientists or an opportunity for exposure to planetary sciences to students in allied disciplines. This is a new approach for supporting low-cost research, whereby the private sector has recognized the importance and excitement of planetary studies. Questions concerning tax-deductible donations or participation in this fund should be directed to Dr. Schultz at the LPI, 713-486-2174.



Dr. Burke has had a growing involvement with the LPI since 1976 when he took on the leadership of the tectonics team of the Basaltic Volcanism Study Project. Since last summer he has served, on a part-time basis, as the Deputy Director of the Institute.

NASA Sponsors Planetary Geology Research Program for Undergraduates

The Planetary Geology Undergraduate Research Program (PGUR) was developed to support and encourage work being done in planetary sciences. Its aims are threefold: (1) to provide incentive for the development of future planetary geologists, (2) to broaden the base of participation in planetary geology, and (3) to introduce traditional terrestrial geologists to planetary studies.

The PGUR Program provides undergraduate students with an excellent opportunity early in their careers to think about and consider planetary work. Participation can afford a realistic view of research and a chance for undergraduate students to appraise their interest in a particular area of planetary studies. In some instances this experience may prove to be decisive, influencing a career in planetary geology, or it may be of equal value if the student decides to pursue a career in terrestrial geology.

Students chosen to participate in the program will work (under the supervision of Dr. John S. King, SUNY/-Buffalo) with a NASA-sponsored research investigator for six to eight weeks during the summer months (June, July, August). In exceptional cases, extensions can be made. Typical tasks in which undergraduate researchers may become involved include: volcanic modelling experiments, wind tunnel projects, lunar crater morphological studies, data processing, organizing and interpreting data for topical studies of the Moon, Mercury and Mars, photogeological studies of the Moon, Mars and Mercury, and comparative geology field stations.

Students who are *undergraduates* majoring in geology or related sciences and have not been previously selected are eligible for this program. This includes class of 1984 graduates. Deadline for application is January 15, 1984. *To obtain more information about the program, contact:*

Mrs. Christine Gibbons, Project Manager
Planetary Geology Undergraduate Research Program
State University of New York at Buffalo
4240 Ridge Lea Road
Amherst, NY 14226 (716-877-3724)

The PGUR Program is supported by the Planetary Geology Program Office, NASA Headquarters, Washington, DC. Questions concerning this program should be addressed to Mrs. Gibbons or Mr. Joseph M. Boyce, Planetary Geology and Geophysics Program Office, NASA Headquarters, Code EL-4, Washington, DC 20546.

1983 LPI Summer Intern Program

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 11 and ends August 17, 1984, although these dates can be adjusted somewhat to fit individual schedules.

Elegibility and selection criteria

Undergraduates, including class of 1984 graduates, are ellgible and will be considered for appointment without regard for race, creed, color, sex, national origin, age, handicap status or other nonmerit 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 20, 1984.

Potential areas of research

Cosmic dust characterization, meteorite fall statistics, meteorites and their origins, planetary regolith studies, Mars soil analog chemistry, trace element partitioning studies, volcano morphology characterization, planetary volcanism and thermal histories, geophysical modeling, fluid inclusion studies, experimental petrology, petrology and geochemistry of Precambrian rocks, remote sensing data processing, planetary impact cratering processes, image processing, photogeology, and studies of continental rift valleys. Each project will be coordinated by an LPI or JSC scientist.

Application deadline is March 19, 1984:

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. Application forms may be requested from Mrs. Pam Jones at LPI. In addition, arrange for the sending of official transcripts and

three letters of recommendation covering academic achievement, career potential and character. Send these materials to:

SUMMER INTERN PROGRAM
The Lunar and Planetary Institute
3303 Nasa Road 1
Houston, TX 77058

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

Proposed Workshop on Early Earth: The Interval From Accretion to the Older Archean

As part of the Crustal Genesis Project, plans are underway to hold a workshop at the LPI, tentatively scheduled for April 1984, to review our understanding of the processes of earth formation and our understanding of the older Archean rocks with a view to addressing the questions:

What was the earth like between its formation and that of the oldest preserved rocks?

What theoretical, observational or experimental studies can be initiated at this time in order to address this question?

The workshop would involve a range of disciplines and also what recent advances in studies of planetary accretion, isotope geochemistry, thermal history modelling and Archean geology could all influence our way of looking at this fascinating interval.

For more information about this workshop please contact Pam Jones, LPI Projects Office, 713-486-2150.

Planning Begun for Topical Conference on Origin of the Moon

A major unsolved problem in planetary science is the origin of the moon. Although several new models for lunar origin have been proposed since the return of Apollo and Luna samples, there has never been a conference devoted exclusively to this fascinating topic. It is tentatively planned that a Lunar and Planetary Institute Topical Conference, co-sponsored by the Division for Planetary Sciences of the American Astronomical Society and the LPI, concentrating solely on how the moon may have formed will be held in October, 1984.

We know more about the early evolution of the moon than about any other planetary body. This knowledge derives from the lunar research program, which includes lunar sample, experimental, geophysical, remote-sensing, and theoretical studies, and it allows us to place constraints on how the moon formed. For example, isotopic studies have demonstrated that the moon experienced a major differentiation prior to 4.4 billion years ago. If the moon formed by fission from Earth, therefore, the fission must have taken place before 4.4 billion years ago. Furthermore, meteorite research, missions to other planets, and theoretical studies of planet formation have sharpened our understanding of processes operating during the earliest stages of solar system history.

The goal of the conference is not to determine once and for all how the moon formed (that's a dream, not a goal!), but to assess our present understanding of lunar (and hence planetary) formation, and to reveal where our knowledge is too meager. It is hoped that the conference will lead to research designed to test specific models and possibly help in planning new planetary exploration missions.

If you are interested in participating in this conference contact Pam Jones, Projects Office, LPI, 713-486-2150.

Crustal Genesis Study

A Space Science and Applications Notice announcing the CRUSTAL GENESIS STUDY sponsored by the Planetary Geophysics and Geochemistry Program, NASA Office of Space Science Applications, has been distributed. Proposal due date was September 1983.

The Crustal Genesis Study supports scientific investigations aimed at understanding the formation and evolution of the crusts of the terrestrial planets, highlighting both their similarities and their differences. This represents a major new research effort, involving acquisition of new data sets as well as synthesis of already existing planetary data and theory. The specific objectives are to identify the key physical and chemical processes and the initial conditions for

crustal evolution, to understand the evolution of planetary crusts in relationship to the overall history of individual planetary bodies, and to understand the reasons for the differences in evolution among the various planetary crusts. The strategy is to adopt an interdisciplinary and cross-planetary approach to the questions of crustal genesis.

Relating to this study, the 1983 Archean Geochemistry-Early Crustal Genesis Field Workshop was held in Ottawa and areas of northeastern Ontario, August 10-16, 1983. Sponsors for the field workshop were:

Geological Survey of Canada
International Geologic Cooperation Project
Lunar and Planetary Institute
National Aeronautics and Space Administration
Ontario Geological Society

Forty-six scientists participated in the workshop, which was convened by Lewis D. Ashwal, LPI, and Kenneth D. Card, Geological Survey of Canada. Abstract volumes, including a field guide, were produced by the Lunar and Planetary Institute for distribution to registered participants. Abstracts submitted for the workshop were presented to the group during sessions held August 10 at Alice Wilson Hall, Geological Survey Building, Ottawa. The field trip to examine the characteristics and interrelationships of Archean greenstone-granite and high grade gneiss terranes of the Superior Province included stops at outcrops in the areas of Sault Ste. Marie, Wawa, Chapleau and Timmins, Ontario. A wrap-up meeting was held in Timmins on August 15 for those interested in collaborative research. It included a presentation by L. E. Lutha, Ministry of Natural Resources, Timmins.

Another workshop in the continuing series of meetings concerning early crustal genesis of the earth and planets was sponsored and conducted by the LPI at the Max-Planck Institut für Chemie in Mainz, Germany. This informal workshop attended by over sixty persons, addressed the extent to which asteroidal and lunar regoliths have collected and preserved (in meteoritic regolith breccias and in lunar soils and soil breccias) a record of the flux, energy, and compositional history of the solar wind and solar flares.

LPI Technical Reports are being prepared for both of these workshops. Availability and information for obtaining them will be included in the February issue of the Lunar and Planetary Information Bulletin.

The Lunar and Planetary Institute is also publishing a newsletter dedicated to this Crustal Genesis Study. If you wish to receive that newsletter, please contact the Projects Office, LPI, 713-486-2158.

Asteroid Project Principal Discovery Announcement

Another Earth-approaching asteroid has been discovered by an Asteroid Project Investigator. Dr. R. Scott Dunbar made the discovery with the 48"/1.2m Schmidt telescope at Mt. Palomar while working on the Planet-Crossing Asteroid Survey team with project Principal Investigator Eleanor Helin.

The asteroid is of the Amor class, meaning that its orbit brings it near the Earth's orbit from time to time. While not a particularly good candidate for a rendezvous mission, it is a remarkable object because of its brightness. Preliminary measurements suggest that it is two or three times brighter than other objects of the same size, and that it is about 640 meters (1/2 mile) in diameter.

Physical and Orbital Data

Semi-major axis	2.0458 AU
Eccentricity	0.476
Inclination	9.3723 degrees
Period	2.926 years
Perihelion distance	1.072 AU
Albedo	27%

Follow-up observations and positional data were obtained by Eleanor Helin using the .9 meter CERGA Schmidt near Nice, France. Infra-red data was then taken by the Infra-Red Telescope Facility (IRTF) in Hawaii, which provided the knowledge about the object's size and albedo.

Other significant discoveries by Asteroid Project supported researchers in 1983 include:

1983 LB—Amor class, discovered by Steve Swanson, June 12/13
1983 LC—Apollo class, discovered by E. F. Helin, June 12/13
1983 LD—Hungaria class, discovered by E. F. Helin, June 12/13
1983 PA—Phacaea class, discovered by E. F. Helin, August 7/8

1983 PA is of special interest for several reasons. It is a very deep Mars-crosser with a high inclination, and it is very bright. Recent observations by the Bulgarian National Observatory provided new orbital data about 1983 PA and were the first formal observations ever submitted by this facility.

Recent contributions by the Planetary Society have allowed important equipment purchases and continued grant funding for Research Assistant Steve Swanson. The acquisition of a portable microcomputer has been made possible through the generosity of Otrona Advanced Systems of Boulder, Colorado.

Eleanor Helin and Scott Dunbar are planetary scientists at the California Institute of Technology's Jet Propulsion Laboratory. Their work is conducted with primary support from the National Aeronautics and Space Administration. The World Space Foundation provides supplemental financial support and volunteer assistance. Steve Swanson is a student at the California Institute of Technology and an Asteroid Project Research Assistant.

Additional information about the Asteroid Project may be obtained by contacting the World Space Foundation Asteroid Project, P.O. Box Y, South Pasadena, California 91030, USA.

World Space Foundation Press Release,
September 27, 1983

IRAS Discovers its Fifth Comet

The Infrared Astronomical Satellite (IRAS) has discovered its fifth comet and enabled its future position to be predicted without the aid of optical telescopes.

IRAS is an international satellite developed and operated by NASA, the Netherlands Agency for Aerospace (NIVR), and the United Kingdom's Science and Engineering Research Council (SERC).

On July 28 the IRAS comet searching team at the Preliminary Analysis Facility, Chilton, found what they believed was a faint comet, at very southerly declination. Unfortunately, there are few telescopes suitable for confirmation of IRAS candidates in the Southern Hemisphere and bad weather prevented the object's being discovered.

Five weeks later, on Sept. 2, a similar object was detected, and Dr. John Davies realized that it was possibly a second scan of the July 28 object. A quick calculation of the object's motion supported the belief that the two detections could be a new comet, so the positions were communicated to the Smithsonian Astrophysical Observatory (SAO), Cambridge, Mass.

The observatory confirmed that all the detections fitted a parabolic orbit, typical of long period comets. An ephemeris was calculated from the IRAS data predicting the position of the object several weeks ahead and sent to other smaller telescopes. These telescopes are not suitable for confirmation of faint IRAS objects unless predicted positions are available, reducing the area that must be searched.

On Sept. 11, using the predicted position, Alan Gilmore and Pamela Kilmartin at Mt. John Observatory, New Zealand identified the faint new comet and it was designated Comet IRAS 19830. This is the first time a comet has been discovered, and its orbit successfully predicted, using data from an astronomical satellite. The new comet will pass closest to the sun in November, but even then it will be outside the orbit of Mars, so it will not be visible to the naked eye.

19830 is the third comet fainter than 17th magnitude discovered by IRAS. The experience gained during the search at the Preliminary Analysis Facility will allow other faint comets to be identified during final data processing at NASA's Jet Propulsion Laboratory, Pasadena, Calif., which in turn will enable better estimates of the total number of comets to be made. A detailed understanding of the comet population is important to theories of the formation of the solar system and the evolution of the planets.

NASA News Press Release No. 83-148, September 30, 1983

NASA to Make AIAA a Source for Information Database

NASA has arranged to make bibliographic data containing descriptions of more than 1.2 million reports and articles covering the world's aeronautical and space literature since 1962 available for leasing through the American Institute of Aeronautics and Astronautics (AIAA) located in New York.

Regularly updated with about 70,000 document citations each year, this computer-readable database is the most comprehensive aerospace database available directly to United States organizations. It can be leased by domestic organizations from AIAA for access only within the United States. There are an estimated 200,000 end-users whose work can benefit from the sophisticated technology documented in this system.

The electronic data, to be known as the Aerospace Database, is a combination of the existing abstract periodicals—*Scientific and Technical Aerospace Reports (STAR) and International Aerospace Abstracts (IAA).* It will be licensed to online vendors and leased to domestic corporations for use in their inhouse database systems. With this new arrangement, all domestic organizations will have direct access to primary aerospace information, supplementing the access already available through NASA's online system, RECON, and through NASA-supported Industrial Applications Centers and State Technology Centers.

AIAA will undertake a national marketing effort, not only to reach information intermediaries, but to train scientists and engineers to search the database directly. The objectives of this program will be to:

- Increase utilization of information contained in the printed versions of STAR and IAA;
- Supplement existing online access to the NASA database already available to NASA and other government organizations, to their contractors, and to universities with aerospace programs;
- Enhance the non-aerospace technical community's access to NASA-generated technology; and,
- Make greater use of private-sector capabilities for dissemination of government-sponsored information.

AIAA and NASA have shared in design and production of the database since 1963 when NASA began supporting AIAA's preparation of IAA and adding it to the NASA database. IAA covers worldwide aerospace conferences, books, and journal literature, while STAR covers principally government-sponsored reports and conference proceedings.

NASA News Press Release 83-146,
September 29, 1983

Moscow Reports Results from Venera

The following is a report from TASS:

Moscow, October 19—Soviet science and engineering industry scored a new major success in the exploration of the planets of the solar system. The "Venera-15" Soviet interplanetary probe, now orbiting Venus as its artificial satellite, made and transmitted to Earth the world's first pictures of the areas of Venus which cannot be observed from Earth.

The "Venera-15" Soviet automatic space probe entered an orbit around Venus October 10. The main purpose of the flight is a comprehensive remote study of the surface of the planet and its atmosphere.

In accordance with the flight program, "Venera-15" conducted the first radar probe session October 16. During the session, using its side-view radar, "Venera-15" obtained a high-resolution display of a region adjacent to the pole with an area of more than one million square kilometers. On the picture one discerns impact craters, hills, major fractures, benches, ((as received)), mountain ridges, and details of the relief with sizes varying from one to two kilometers. The picture shows geological formations different in nature pointing to a long period of active tectonic life of the planet and the complexity of geological processes taking place. The results of the probe are of paramount importance for the study of the geological history of Venus, just like that of Earth.

During the first month of the flight of the "Venera-15" station it is planned to adjust the trajectory of its movement with a view to forming a working orbit.

After that, "Venera-15" is to begin a systematic rapid probing of the planet, including detailed radiomapping through the cloud cover of areas of its surface near the northern pole, and also a comprehensive study of the atmosphere and the surface of planet along the flight path. At the same time, preparations will begin for experiments with the "Venera-16" station.

According to telemetric data, the onboard systems and scientific instrumentation of the probes are functioning normally. Information received from the artificial Venus satellites is being processed and studied.

Nomenclature for Satellites of Jupiter and Saturn

R. M. West, IAU General Secretary, informs us that, following the joint recommendation of Commission 20 and the Working Group for Planetary System Nomenclature, the IAU Executive Committee has accepted the following names and permanent designations for recently discovered satellites of Jupiter and Saturn:

Jupiter XIV	Thebe	1979 J2
Jupiter XV	Adrastea	1979 J1
Jupiter XVI	Metis	1979 J3
Saturn XV	Atlas	1980 S28.

The decision concerning Jupiter XIV reaffirms action by the IAU in 1982, at which time the following additional names and designations were accepted:

Saturn X	Janus	1980 S1
Saturn XI	Epimetheus	1980 S3
Saturn XII		1980 S6 ("Dione B")
Saturn XIII	Telesto	1980 S13
Saturn XIV	Calypso	1980 S25.

Saturn X and XI were apparently also both observed in 1966. The list supersedes information given elsewhere in the astronomical literature; specifically, the ordering of the satellites of Jupiter in IAU *Trans. XVIIIA*, 669 is erroneous.

Brian G. Marsden, IAU Circular No. 3872, September 30, 1983

Giant Leap in Search for Other Civilizations in Space

Dr. Carl Sagan, President of the Planetary Society, has announced a major expansion in its Search for ExtraTerrestrial Intelligence (SETI). The membership-supported research is already the world's most advanced SETI project currently operating. Announced at Cornell University at the annual meeting of the Division of Planetary Sciences of the American Astronomical Society, the expansion will increase the project's coverage by sixty-four times. Called META, for Megachannel ExtraTerrestrial Assay, the project will allow the sky to be scanned on 8.4 million radio channels simultaneously, searching for artificial signals from other civilizations.

On March 7, Professor Paul Horowitz of Harvard University turned on the Planetary Society receiver called *Project Sentinel*, located at Harvard's Oak Ridge Radio Telescope. Since then, the large 84-foot dish antenna has been probing the sky constantly, searching 131,000 channels for artificial extraterrestrial radio signals, in a dedicated four-year search program. The new expansion, to be carried out during the coming year, will allow the SETI project to observe 8.4 million channels at a time.

About the expansion, Prof. Horowitz says, "It will make it the biggest analyzer on Earth. It allows us to detect an extraterrestrial civilization that is not beaming a signal specifically to us. It allows us to detect a transmission which is made in the recently-discovered rest-frame of the universe."

Prof. Horowitz, a physicist and electronics expert, has constructed the sophisticated radio receiver to search for a type of signal that an alien society might be transmitting to Earth. Built with funds donated by members of The Planetary Society, it is able to listen to 131,000 radio channels simultaneously. The Society has refurbished an existing 84-foot-diameter dish antenna owned by Harvard University, located in Cambridge, Massachusetts, and arranged for the facility to be dedicated to searching the sky for artificial extraterrestrial signals on a regular basis.

"The electronics revolution that gave us the microchips in our digital watches has allowed us to make this great advance in our search for extraterrestrial neighbors," said Dr. Thomas McDonough, SETI Coordinator of The Planetary Society. "It's wonderfully appropriate that it was the space program that provided the incentive to build the ultra-compact electronics that gave us this revolution. The plummeting cost of the technology has made it possible for us to build an eight-million-channel receiver for a modest sum, an idea which would have been inconceivable just ten years ago. Other SETI projects are under way around the world, but Project Sentinel is the most advanced one actually running at this moment, patiently peering into space for the signals that may one day tell us that we have friends in the Galaxy."

The grant to Prof. Horowitz for his work in SETI was made possible by contributions from Society members, given explicitly for additional research on

SETI. The Society is involved in other SETI efforts and in support and encouragement of planetary programs.

This search fits in with the SETI program endorsed just one year ago by 70 scientists around the world, including seven Nobel laureates. Their petition, initiated by Carl Sagan, appeared in the journal *Science* on October 29, 1982. The group proposed "a coordinated, worldwide and systematic search for extraterrestrial intelligence" to look for radio signals from elsewhere.

Prof. Paul Horowitz may be contacted at:

Physics Department
Lyman Laboratory
Harvard University
Cambridge, MA 02138
(617) 495-3265

Planetary Society Press Release, October 13, 1983

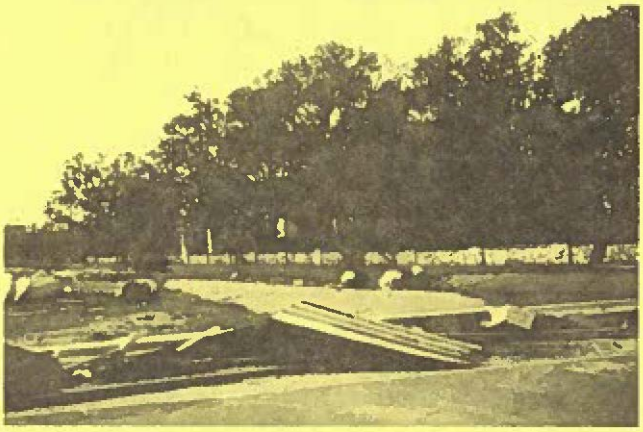
Alicia Visits the LPI

On August 17, the Texas Gulf Coast and the Lunar and Planetary Institute were visited by a very capricious lady named Alicia. For many of us this was our first experience with a hurricane and the memories will linger a long time.

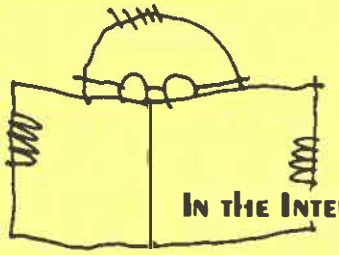
Many people have inquired about the fate of the Institute as a result of the winds in excess of 100 miles/hour and the 10-12 feet storm surges that were recorded on Clear Lake. Damage in the area was very spasmodic with some apartment complexes suffering severe structural damage while others lost only a few shingles or had a sign blown down.

For the most part the damage sustained was due to the winds. We had no flooding at the Institute. The water line shows that the water probably came about half-way up the front yard.

The name of the game in the clean-up after this storm was "Trees". We lost approximately 25% of the trees at the Institute while most of the remainder had some damage. The pecan crop is gone this year and several of the pecan trees were totally up-rooted. We had damage to the roof of the main building and some minor damage elsewhere. We were without electric power for nine days following the storm and without telephone service for almost two weeks.



To show you the picture that some of us got when we surveyed the Institute on the days immediately following the storm, we are printing a collage of pictures taken by various staff members.



In the Interest of Economy...

Several of our colleagues in government agencies have commented to us about the cost of obtaining a check to cover the postage and handling assessed for the LPI Contributions, Technical Reports, and Abstract volumes. To help save these costs and to get the publications to individuals more quickly, we will now accept a franked label if sent with the order.

When ordering LPI publications from the Library/Information Center at the Institute, please include a franked label with your address on it with your order and we will send the publication to you as soon as possible. If ordering more than one item, please include a label for each item. Sometimes it is possible to get more than one publication in an envelope but not always. Any extra franked labels will be returned to you. THIS DOES NOT APPLY TO OTHER PUBLICATIONS OF THE INSTITUTE where a charge is made to cover the cost of publication such as Dr. Taylor's book *Planetary Science*, or *Chondrules and their Origins* edited by E. King.

The editor, *LPIB*

NEW PUBLICATIONS

Please order the following publications from the sources indicated. The LPI is not a distribution center for these materials. In general, government documents can be ordered from the Superintendent of Documents, Government Printing Office, Washington DC 20402. Although the 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.

New Catalogs from GPO

The Government Printing Office is now publishing two catalogs to take the place of the *Selected U.S. Government Publications*.

U.S. Government Books is a quarterly catalog containing annotations for nearly 1,000 of the agency's best sellers; and *New Books* is a bimonthly listing of all the publications added to the sales inventory since the previous issue.

A recent announcement from the GPO stated that if you had been receiving the *Selected U.S. Government Publications* your name was placed on the mailing list for *New Books*. However, this may not be true in all cases. We have yet to receive the first copy through this channel in the LPI Library although the issue reviewed was volume 1 Number 6, May-June 1983. If you are not receiving this announcement catalog, write to GPO and ask to be placed on the distribution list.

GPO claims that since the quarterly catalog *U.S. Government Books* will contain about 85% of the same titles from issue to issue, a general mailing list is not maintained. They indicate that if you purchase from one issue you will get the next. How you get the first issue remains a bit of a mystery so it is suggested that, if you are interested in keeping up with U.S. Government publications, you also write GPO and request a copy of this catalog.

Journal Changes Extent of Content

With volume 30 no. 1, February 1984, the journal *The Moon and the Planets* will be titled *Earth, Moon, and Planets*. The content will be expanded to include the Earth as an astronomical body studied by spaceborne means.

In 1984 two volumes of *Earth, Moon, and Planets* will be published, each consisting of three issues, appearing in February and alternate months thereafter. Questions about the change in journal scope may be directed to the Journals Manager, D. Reidel Publishing Co., P. O. Box 17, 3300 AA Dordrecht, The Netherlands. Papers for the journal may be submitted to the editors of *The Moon and the Planets.*

MMI Offers Space Science Video Cassettes

MMI Space Science Corporation is offering a number of 30-minute video cassettes which can be used in the classroom for instruction in space science. Among the topics covered are: The Flight of Apollo 11, Jupiter Odyssey, Story of Our Universe, First Flight of the Space Shuttle, and a History of the Apollo Program. For a complete listing of the cassettes available with the prices for each, contact MMI Space Science Corporation, Dept. VCR-83, 2303 N. Charles Street, P. O. Box 19907, Baltimore MD 21211.

Solar System Slide Sets

The Astronomical Society of the Pacific is offering two new slide sets. Titled *Solar System Close-up* and *Solar System Close-up: Set Two*, the two sets have been selected by Dr. David Morrison, University of Hawaii. The first set, AS411, consists of 50 slides selected to show the geological and atmospheric processes which have shaped the planets and similar bodies. The slides have clear accompanying captions to provide an excellent and up-to-date guide to our home system. Price: $34.95

The second set, AS412, consists of an additional 50 slides, none of them duplicates of any in the first set. This collection includes such memorable views as the new Soviet Venera color photos of Venus, a variety of spectacular geological and atmospheric features on Earth (for direct comparison with the other planets), frost on the Martian surface, a close-up of the grooved terrain on Ganymede and much more. Detailed captions are also included with this set. Price: $34.95

The Astronomical Society of the Pacific is a nonprofit organization providing many materials of an educational nature in astronomical and planetary sciences. They are located at 1290 24th Avenue, San Francisco CA 94122. If you are interested in materials in these sciences for educational purposes or personal enjoyment a review of their catalog is certainly indicated. They will send one to you upon receipt of a stamped, self-addressed envelope.

Free Table of the Solar System

The Astronomical Society of the Pacific is making available a complete, updated table of the characteristics of all the known planets and satellites in our solar system. Prepared under the supervision of noted planetary astronomer David Morrison, the table includes all the recent results from planetary flyby missions and earth-based telescope observations.

As a public service, the non-profit Society would be happy to provide a copy of the table to anyone who sends a *stamped self-addressed envelope* to:

Solar System Table
Astronomical Society of the Pacific
1290 24th Avenue
San Francisco, CA 94122

(Outside the U.S. please send an addressed envelope with International postage payment coupon.)

Astronomical Society of the Pacific Press Release, May 2, 1983

New Book Solves Mind-Boggling Problems

Neil McAleer has written a book *Cosmic Mind-Boggling Book: an Illustrated Guide that Uses Your Senses to Bring the Wonders of the Universe down to Earth* which contains the answers to those questions that one wonders about but doesn't know where to look for the solutions. The title tells it: contained in the 205-page well-illustrated paperback are several thousand facts astronomical, considered by some to be trivia, but explained in a way that makes the gigantic relationships involved in discussions concerning our galaxy much more meaningful. "If our solar system (the Sun and nine planets) could fit into a coffee cup, our Galaxy would be the size of North America." "If you could hold a square mile of sunlight in your hand, it would weigh three pounds." Published by Warner Books for $7.95 it makes great pick-up reading and should be of interest to anyone with a bent for things astronomical.

Records of Achievement

NASA SP-470, a somewhat flashier version of the earlier listing of NASA special publications (NASA SP-449), takes advantage of its appearance in the 25th anniversary year of NASA to include a brief history of the agency illustrated with several colored photographs. Primarily, though, the publication is a

listing of the Special Publications, Conference Publications, and Reference Publications published by NASA in the 25 year period. An attempt at a subject Index has been made in this issue, although when you have 96 numbers listed under "Lunar and Planetary Exploration," it is still a tedious task to find the publication you are looking for. The general arrangement is still basically by the number of the publication. It is hoped that if another attempt is made to publish this kind of list which is really very much needed, the age of computer-technology be utilized and an author index and possibly a title keyword index also be included.

The National Technical Information Service will fill requests for a single copy as long as the supply lasts. Write NTIS, 5285 Port Royal Road, Springfield, VA 22161 and request NASA SP-470

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 February. Copy deadline is January 9, 1984. 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.

Editor: Frances B. Waranius,
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NOTE TO OUR READERS: *PLEASE* let us know when you move. Each change of address which we get through the postal service costs us $.25-$.80 in return postage costs. Because of the high costs of postage, we will make the address change on our list but we will no longer send the current issue out to you on a straight third or first class mailing. This means you will miss receiving whatever mailing from the LPI we get from the Post Office with your change of address.

If you want to be sure that you get all of your mailings from the Institute promptly, be sure to send a change of address to: Mailist, Lunar & Planetary Institute, 3303 NASA Road One, Houston, TX 77058. It often takes the postal service 60-90 days to return an item to us with the address correction. Do yourself and us a service. Remember the LPI Mailing List when you move. Thanks. (*ye editor*)

CALENDAR

October 31-November 3

Geological Society of America, Annual Meeting, Indianapolis, Indiana, with associated societies
Contact: Arthur Mirsky
Dept. of Geology
Indiana University/Purdue University
925 W. Michigan Street
Indianapolis IN 46202
Phone: 317-264-7484

November 16	Second circular and abstract forms for XV LPSC to be mailed
December 5-9	American Geophysical Union, Fall Meeting San Francisco, California Contact: American Geophysical Union 2000 Florida Avenue NW Washington DC 20009 Phone: 202-462-6903
January 4-7	Protostars and Planets II University of Arizona, Tucson, Arizona Contact: M.S. Matthews Lunar and Planetary Laboratory University of Arizona Tucson AZ 85721 Phone: 602-621-2902
January 9	DEADLINE for submission of ABSTRACTS for XVth LPSC
March 12-16	XVth LUNAR AND PLANETARY SCIENCE CONFERENCE NASA/Johnson Space Center, Houston Texas Contact: Pam Jones Lunar and Planetary Institute 3303 NASA Road One Houston TX 77058 Phone: 713-486-2150
March 19	Application deadline for LPI Summer Intern Program
April	Tentative dates for Workshop on Early Earth Houston, Texas Contact: Pam Jones Lunar and Planetary Institute 3303 NASA Road One Houston TX 77058 Phone: 713-486-2150
April 16	DEADLINE for Manuscripts for the Proceedings of the XVth LPSC
July 30-August 2	47th Meteoritical Society Annual Meeting University of New Mexico, Albuquerque, New Mexico Contact: Dr. Klaus Keil Department of Geology and Institute of Meteoritics University of New Mexico Albuquerque, NM 87131 Phone: 505-277-2747
October	Tentative dates for Topical Conference on the Origin of the Moon

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Lunar & Planetary Institute

C²PDA NEWSLETTER

Number 1, November 1983 **Kinpong Leung, Editor**

This is the first issue of a newsletter intended to keep the scientific community informed on the work currently being carried out at C²PDA.

WHAT IS C²PDA?

C²PDA—the Computing Center for Planetary Data Analysis—is a research branch at the Lunar and Planetary Institute dedicated to access and utilization by the earth and planetary science community for the analysis of the extensive collections of image data and global datasets obtained by interplanetary probes and remoting sensing satellites. It also serves as a focal point for remote sensing and geophysical research within the LPI. It provides access to the data collections obtained from missions ranging from Apollo, Pioneer, Viking, Voyager to LANDSAT, SEASAT and MAGSAT. C²PDA encompasses two separate yet related facilities, IPF, the Image Processing Facility and GDF, the Geophysical Data Facility. They are both located in McGetchin Hall at the LPI.

IMAGE PROCESSING FACILITY (IPF)

The role of IPF is to provide facilities for research into and development of image processing, analysis and interpretive techniques of planetary images. It is designed around the DEC VAX 11/780 computer and the Gould/De Anza IP8500 Image Processing system. Current system capabilities include band ratioing, histogram generation, destriping, density slicing, geometric correction, digital filtering, Fast Fourier Transform(FFT), contrast enhancement, edge enhancement, edge detection, principal component analysis, mosaicing, and classification on LANDSAT and other planetary images.

The software is built around the LIPS package, a FORTRAN-callable library of image processing software, developed and supported by Gould/De Anza, with additional routines converted from the VICAR package from JPL and the ELAS package from NASA Earth Resources Laboratory. Additional programming for specialized routines is provided by the in-house programming staff to provide a variety of ready-to-use, user-oriented image processing tools for both the sophisticated as well as the casual user.

The hardware features four 512 × 512 × 8 bit image channels that can be configured as three band true color (24 bits), four band multispectral (32 bits) or a single 1024 × 1024 × 8 bit channel viewed through a 512 × 512 window using real time zoom/pan. A high speed digital video array processor handles most of the image manipulation tasks. It is interfaced through the UNIBUS to the DEC VAX 11/780 computer system, with 650 megabytes online disk storage and a 9 track 800/1600 bpi tape drive. The system is equipped with a 19 inch delta gun color display monitor, a joystick and a video scanner for analog inputs. The hardcopy unit is a Matrix Instrument model 3000 color graphic camera that provides full color, black and white, and color separation images on 4 × 5 film backs, and 35mm slides and prints.

GEOPHYSICAL DATA FACILITY (GDF)

GDF provides a set of research tools to analyze geophysical datasets such as gravity and magnetic data on a regional/global basis, to compare datasets of different geophysical phenomena over the same geographical area and to utilize iterative as well as image processing techniques for analysis and modelling of these datasets.

A user oriented package has been developed to allow users to select a planet, have the global coverage of the desired dataset displayed graphically, and compile a dataset of a region of interest. Profiles and 3-D perspectives of the area of interest can then be displayed. Comprehensive software is available to compare the observed data with the data predicted by physical models.

An Analogic AP500 32 bit floating point array processor with 2 megabytes of memory is used in conjunction with the DEC Vax 11/780 for fast complex calculation. An important feature of GDF is the capability for users with a DEC VT125 compatible graphic terminal to dial in through 1200 baud modems to analyze the datasets on a remote access basis.

The GDF dataset collections include earth topography, SEASAT, MAGSAT, Venus topography and LOS (line-of-sight) gravity, Mars topography, LOS gravity, thermal inertia and albedo and the Lunar Consortium datasets. Most datasets are of quarter degree resolution in latitude and longitude except for LOS gravity data which can be gridded to quarter degree resolution for a given area of interest.

CURRENT PROJECTS

Work is carried out at C²PDA on modelling of gravity and magnetic anomaly field data for the earth and the terrestrial planets, mapping and analysis of volcanic

terrains in the Central Andes, Galapagos Islands and Arizona, structural analysis of planetary satellites, analysis of Martian ridge systems and relation to global tectonics and basin-controlled tectonics, and analysis of ejecta trajectory in impact crater experiments under different atmospheric conditions.

STAFF

C²PDA is operated at the LPI with a technical staff under the Computer Systems Manager, with LPI scientists acting as scientific Advisors to different facilities within C²PDA.

Kinpong Leung, Computer Systems Manager
Rebecca McAllister, Scientific Programmer/Analyst (IPF)
Brian Fessler, Scientific Programmer (GDF)
Jackie Lyon, Programmer/User Support
Dr. Roger Phillips, Consultant to the Institute in the field of Geophysical Data Processing
Dr. Peter Schultz, Scientific Advisor to IPF (planetary)
Dr. Peter Francis, Scientific Advisor to IPF (terrestrial)
Dr. Bruce Bills, Scientific Advisor to GDF (beginning 2/84)

ACCESS

C²PDA is dedicated to access and utilization by the earth and planetary science community. We encourage both onsite visits as well as remote access through dial-in modems. For further information, please contact:

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