

CURATORIAL NEWSLETTER	DATE: OCTOBER 20, 1981	NO. 33
	<i>Doug Blanchard</i>	
	DOUGLAS P. BLANCHARD, LUNAR SAMPLE CURATOR CURATORIAL BRANCH, SN2, NASA/JSC HOUSTON, TEXAS 77058, 713-483-3274	

Three join Curatorial Staff

Uel Clanton, John Dietrich, and Jim Gooding are now working in the Curatorial Branch. John is working in the lunar sample area and Uel and Jim are working with the cosmic dust collection.

Uel Clanton, a long time member of the Planetary and Earth Science Division, transferred to the Curatorial Branch from the Geology Branch. Uel has been instrumental in establishing the Cosmic Dust Program, and as the ultraclean laboratory became operational he moved to this branch. He is continuing to design collectors and to coordinate flying time for them. He is also preparing for the preliminary examination of cosmic dust particles in the JSC SEM lab.

John Dietrich joined the branch in August transferring from the Earth Observation Division here at JSC. He is no stranger to the Moon; he was on the Apollo lunar mapping team during site selection for the landings. He has spent his intervening years applying remote sensing techniques to terrestrial problems. He is a geologist, with considerable experience in West Texas geology. He will be the LAPST Secretary, the curatorial representative on LPRP and will manage the lunar sample PI contracts, in addition to his duties as Associate Curator for lunar samples.

Jim Gooding was hired in September. He will work with the Cosmic Dust Program, and be an active participant in the preliminary examination. In addition, he will field sample requests from PIs. Jim did his thesis work on meteoritic chondrules at University of New Mexico with Klaus Keil. He has done a variety of work on planetary surface processes and planetary geology at JPL for two years prior to coming to JSC.

LAPST met at the end of August, meets again in November

The Lunar and Planetary Sample Team (LAPST) met at the Lunar and Planetary Institute (LPI) August 28-31, 1981. In response to nine requests for extraterrestrial samples from eight Principal Investigators, the LAPST recommended allocation of 383 lunar samples weighing approximately 72.3g. One request for cosmic dust was tabled until the next meeting. (See announcement in this newsletter.)

Five of the lunar sample requests were related to the Highlands initiative, several clearly stimulated by the Apollo 16 conference held at the LPI in November of 1980.

The next LAPST meeting is scheduled for November 19-22, 1981. Please submit requests for lunar and cosmic dust samples to this office no later than November 5. Requests received after that date will not be considered until the February LAPST meeting. The LAPST membership list, committee assignments, and assignments as PI advocates are included in this newsletter for your information.

Highlands Initiative

Workshop on Comparisons Between Lunar Breccias and Soils and Their Meteoritic Analogs.

The Workshop on "Comparisons Between Lunar Breccias and Soils and Their Meteoritic Analogs" will be held at the Lunar and Planetary Institute on November 9-11, 1981. A final schedule has been devised and all invited speakers, session chairs, and summarizers have been lined up. The anticipated attendance will be between 50 and 60.

The Workshop sessions will address four major topics: 1) Petrology and chemical compositions, 2) Ages and exposure histories, 3) Cratering dynamics, and 4) Models for regolith evolution. The first two topics will be covered during the first day of the Workshop and the second two on the second day. The third day will be devoted to summaries of the previous sessions and discussions of potential collaborative research. The format chosen should allow for at least half the time to be devoted to discussion.

Workshop on Magmatic Processes in Early Planetary Crusts -- A success

The Workshop on "Magmatic Processes in Early Planetary Crusts" was held as scheduled August 3-9, 1981, in Billings and Nye, Montana. The objectives of this workshop were to review the current state of knowledge on lunar highlands pristine samples and terrestrial layered complexes, and to discuss the theories of origin that have been proposed for these two types of cumulate-textured samples in the context of the exciting development which have recently emerged from studies of terrestrial cumulate-textured rocks. The convening of this workshop in Montana allowed field trips to the Stillwater complex where a full range of magmatic cumulates was observed in geologic context.

The workshop had three days of field trips to inspect the sections of cumulate rocks in the Stillwater complex. The venerable, first-order story of crystallization and gravitational settling of crystal is very appealing explanation for gross properties of this stratiform intrusion. However, it was very obvious in the field that the processes responsible for forming the cumulate layers must be more complex than implied by the old, simple story. Of particular interest and significance to the lunar investigators present was the realization that virtually the entire range of pristine lunar highlands rock types could be and was observed in a single outcrop. An additional field trip was devoted to the Archean basement rocks into which the Stillwater was intruded.

The keynote presentations and discussions were stimulating and the field trips were most instructive. Although it was felt that we had not seen or discussed an exhaustive spectrum of rocks and issues due to time and energy constraints, the workshop was generally judged a success. A workshop report is in work.

Apollo 16 Sessions at the 13th Lunar and Planetary Science Conference Planned

As a follow-up to the Workshop on Apollo 16 held in November, 1980, plans are being made for a session devoted to Apollo 16 results at the next Lunar and Planetary Science Conference (March, 1982). Details will be announced in the next Highlands Newsletter.

Apollo 16 Workshop Report Available

The report of the Apollo 16 Workshop has been printed and is available from the LPI.

Work to Begin Soon on Lunar Core 64001

Dissection work has been completed on 64002. Preparations are proceeding to extrude and dissect 64001. Present plans predict allocations from 64001 as early as mid-December. It would be appropriate to request samples from this core at the November LAPST meeting.

Cosmic Dust Program

Cosmic Dust available for Allocation

A limited number of particles are now ready for allocation; by the end of October we expect much more material to be available. Request for this material will be considered by LAPST at its next meeting November 19-22, 1981. Requests for cosmic dust particles must be accompanied by a scientific rationale, and anticipated analytical flow scheme.

Investigators who are not already authorized to work on cosmic dust (i.e. have not included it in their approved research proposals) should request a no cost change of scope for their approved research proposals. Those requests should be sent to the Curator's Office where they will be referred to LPRP (or a subcommittee) for approval. Requests involving funds will be reviewed through normal LPRP channels probably in the February to July cycle.

Preliminary Examination and Allocation Plan

At the end of October we anticipate that 24 collection flags will be available for sample work. In accordance with LAPST recommendations, 6 of these collectors will be saved untouched for the immediate future, not more than 6 will be made available to investigators who require whole flags for their work, and the remaining collector flags will be processed at JSC according to the following plan.

All particles $>20\mu\text{m}$ and a "representative number" of particles $3-20\mu\text{m}$ will be removed. (Transparent spheres $<10\mu\text{m}$ will be excluded.) These particles will be mounted 16 to a mount on SEM stubs. All particles picked from the collection surfaces will be cleaned (of silicone oil) and examined first optically, then with the SEM. They will not be coated with carbon or metal films.

Preliminary examination will include optical characterization in transmitted and reflected light, one or more SEM picture(s) and a raster-scanned average EDX elemental analysis. Special features will be noted. Present plans call for compiling this data in a catalog that will serve as an order catalog for investigations.

There are several modes of allocation envisioned:

A) Entire collection surfaces.

Entire collection surfaces will be made available to investigators who prove a need for samples of this type. This request mode is not generally encouraged and investigators should demonstrate that their laboratory facilities and experience are sufficient to work on the collector without degrading unpicked particles. To assure that the PI understands what procedures and equipment are appropriate, a laboratory visit to JSC or a veteran dust laboratory is recommended. After processing, the surface will be returned to JSC. The option is available and encouraged for the PI to do the processing at JSC.

B) SEM Mounts

After PET, SEM mounts will be available for optical and SEM examination. No physical contact should be made with the particles at this stage.

The researcher's facilities must meet requirements for cleanliness and they will be required to follow a set of sample handling rules. Basically the mounts should be exposed only to class 100 (or better) air except when mounting in an analysis device. They must not contact surfaces which would transmit or produce organic or particulate contamination.

Removal of specific particles from SEM mounts will not be allowed in a PI lab. Instead, the entire SEM mounts will be returned to JSC, where transfer will be made by the curatorial staff.

C) Specific particles or particle types

This type of request is for particles which normally have completed their preliminary examination and are to be removed from SEM mounts. The nature of the mounting methods for the particles will be determined on a case by case basis by interaction between the PI and the curator. It is, however, envisioned that most such particles will be shipped to the PI's laboratory in a standardized fashion, e.g., embedded in a drop of silicon oil; and the PI then transfers the particle to an analytical device.

Dust Collection Status Report

The first collection flight at JSC with the WB-57F was made on May 8, 1981. After 64 hours of flight the first set of collectors was removed for analysis; over one million cubic meters of air had been sampled. This brief sampling period more than doubled the amount of cosmic dust that had been collected previously at Ames.

The third set of collectors was installed September 15, 1981, and will fly until the end of the JSC WB-57F program (November 1981). It is estimated that the total flight time with the WB-57F will be about 150 hours, the total volume sampled will be approximately 2.5 million cubic meters. We estimate that there will be about 1800 particles $>8\mu\text{m}$ and about 18 $>50\mu\text{m}$.

With the termination of the WB-57F program at JSC, Ames has been instructed by NASA Headquarters to integrate the cosmic dust pylons onto the U-2 and ER-2 aircraft. Headquarters has provided money to Ames to modify their aircraft for the JSC pylons. Blueprints have been exchanged and preliminary work has started by JSC Engineers to modify the JSC pylons to meet Ames - Lockheed specifications for experiments on the U-2 and ER-2 aircraft.

Additionally, Headquarters has provided money to JSC for a design study for larger area collectors. Preliminary sketches indicate that with some redesign, the present pylons could accommodate an increase in collection area from the present 32 to perhaps 240 sq. in. when the "pie pan" concept is utilized.

Actual collecting flights will be limited to engineering test flights from November 1981 to early summer 1982. The fabrication and installation of collectors on the Ames aircraft should be complete by summer and we then anticipate a continuing collection schedule of about 600 flight hours per year.

LAPST MEMBERS

Dr. William Boynton
Dept. of Planetary Sciences
University of Arizona
Tucson, AZ 85721
FTS OP: 261-3900
(602)626-3483

Dr. Donald E. Brownlee
Astronomy Dept.
Washington University
FM-20
Seattle, WA 98195
DD FTS: (202)356-6253

Dr. Gunter W. Lugmair
Chemistry Dept., B-017
University of California, San Diego
La Jolla, CA 92093

Dr. Fred Hörz
Code: SN6
Geology Branch
NASA Johnson Space Center
Houston, TX 77058
DD FTS: 525-5171
(713)483-5171

Dr. Odette B. James
U. S. Geological Survey
National Center
Stop 959
Reston, VA 22092
DD FTS: 928-6641
(703)860-6641

Dr. Douglas A. Leich
Nuclear Chemistry Division
L-232
Lawrence Livermore Lab.
P. O. Box 808
Livermore, CA 94550

Dr. Richard Morris
Code: SN7
NASA Johnson Space Center
Houston, TX 77058
DD FTS: 525-5171
(713)483-5171

Dr. G. Jeffrey Taylor
Dept. of Geology
University of New Mexico
Albuquerque, NM 87131
FTS OP: 474-5511
(505)277-3041 or 2747

Dr. Dave Walker
Dept. of Geology
Harvard University
Hoffman Lab.
Cambridge, MA 02138
DD FTS: 830-2083
(617)495-2083

Dr. Michael B. Duke
Code: SN2
Lunar Sample Curator
NASA Johnson Space Center
Houston, TX 77058
DD FTS: 525-4464
(713)483-4464

ADVOCATE LIST FOR 1981 PI's

MINERALOGY AND PETROLOGY

D. BROWNLEE

Albee
Buseck
Hays
Keil
Lindsley (Bence)
McKay
Phinney
Roedder
Wood

D. WALKER

Arnold
Lofgren
Meyer
Rutherford
Smith
Tatsumoto
Tilton
Wasserburg
Weill

F. HÖRZ

Basu
Englehardt
James
Maurette
McDonnell
Papike
Stöffler
Taylor, L.
Takeda

J. TAYLOR

El Goresy
Hafner
Weiblen
Uhlmann

ISOTOPES AND CHEMISTRY

G. LUGMAIR

Clayton
Epstein
Geiss
Gibson
Kerridge
Kirstein
Pepin
Perkins
Rhodes
Thode

W. BOYNTON

Anders
von Gunten
Haskin
Laul
Nyquist
Reynolds
Schmitt
Wanke
Wasson
De Paolo

D. LEICH

Bhandari
Blanford
Fireman
Hohenberg
Lal
Marti
Pillinger
Signer
Taylor, S. R.
Tombrello
Walker, R.

PHYSICAL PROPERTIES

R. MORRIS

Adams
Ahrens
Brownlee
Dollfus
Fuller
Hörz
Housley
Klein
Reed
Schaeffer
Simmons
Strangway
Turner
Runcorn

LAPST SUBCOMMITTEES

CORE

R. Morris, Chair
F. Hörz
D. Walker

RESTRICTED ACCESS COLLECTION
AND CUTTING PLANS

J. Taylor, Chair
O. James
R. Morris
D. Leich

PUBLIC DISPLAYS
AND EDUCATION

D. Walker, Chair
F. Hörz
D. Leich
G. Lugmair

PROCEDURES AND
LABORATORY

W. Boynton
D. Blanchard (CCO)
D. Brownlee
G. Lugmair

COSMIC DUST

U. Clanton (ex officio)
D. Brownlee, Chair
W. Boynton
F. Hörz

HIGHLANDS INITIATIVE

O. James, Chair
F. Hörz
R. Morris
D. Walker