

LUNAR NEWS

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Next CAPTEM Meeting – March, 2004

Website - <http://curator.jsc.nasa.gov>

**This issue of the
Lunar News
dedicated
to JSC retiree
I. Dale Browne**

Lunar News Mission

The purpose of "Lunar News" is to provide a newsletter forum for facts and opinions about lunar sample studies, lunar geoscience, and the significance of the Moon in solar system exploration.

Editor's Notes

"Lunar News" is published by the Astromaterials Acquisition and Curation Office, Lyndon B. Johnson Space Center (JSC) of the National Aeronautics and Space Administration (NASA). It is sent free to all interested individuals. To be included on the mailing list, write to the address below. Please send to the same address any comments on "Lunar News" or suggestions for new articles.

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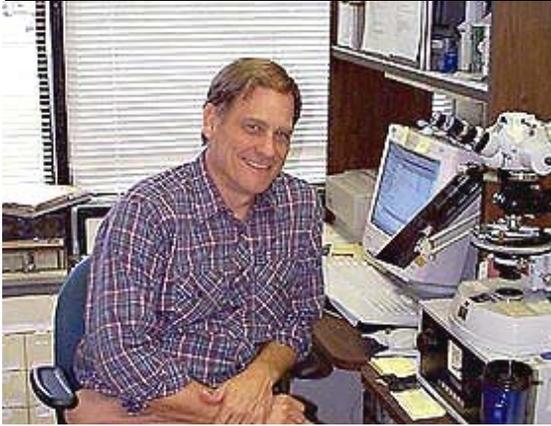
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35th Lunar and Planetary Science Conference

The 35th Lunar and Planetary Science Conference will be held in Houston, Texas, on March 15 – 19, 2004. All technical sessions, both oral and poster, will be held at the South Shore Harbour Resort & Conference Center, 2500 South Shore Blvd., League City, TX 77573. This conference brings together international specialists in petrology, geochemistry, geophysics, geology, and astronomy to present the latest results of research in planetary science. Participants may indicate a preference for oral, poster, or print-only presentation. The four-and-a-half day conference will be organized by topical symposia and problem-oriented sessions. The Program Committee will make all decisions on the mode of presentation to ensure a balance of as many important new research results as possible. Selection criteria will be based on the relevance of the subject matter to the conference and the quality of the science. For further information regarding conference logistics, contact Mary Cloud at cloud@lpi.usra.edu. For further information regarding abstract submission and/or registration information, contact Linda Tanner at tanner@lpi.usra.edu. Contact numbers respectively: 281-486-2143 or 281-486-2142 or fax requests to 281-486-2125. <http://www.lpi.usra.edu/meetings>





Curator's Comments

Gary Lofgren
Lunar Sample Curator
NASA JSC

A year has passed since the last publication of Lunar News and many changes have taken place here at JSC. Carl Agee has left the Astromaterials Research and Exploration Science Office to take the position vacated at the Institute of Meteoritics, University of New Mexico. Dave and Marilyn Lindstrom have left JSC Curation and Education, respectively, and spent a year TDY at NASA Headquarters and they liked it so well they have moved to Washington permanently. We wish them all much success. See related articles by Carlton Allen in this issue about the Astromaterials Acquisition and Curation at JSC.

Lunar samples made the news in a way we all hoped would never happen. A NASA Co-op student and 2 college interns were able to steal a safe with Lunar and meteorite samples from a research scientist's laboratory here at JSC. The theft happened on a Saturday, when no one was working in the lab. The safe was missed by an employee the following Monday morning. Fortunately, the FBI recovered the stolen samples in a little more than a week. The 3 individuals that stole the safe and a fourth individual involved in the attempt to market the samples have been charged with conspiracy to commit the theft and sale of government property. The FBI launched an undercover operation in response to a series of e-mails offering priceless moon rocks for sale prior to the theft. When the theft occurred, the FBI set up a buy and apprehended the individuals. The interns and the co-op student have all been fired. A year later we now know that the 2 interns were sentenced to probation for 3 years. The Judge determined that they were the least culpable. The fourth individual has been sentenced to 6 years in a Federal facility (for a Federal sentence a minimum of 85% is served before parole is considered). The NASA Co-op, the main perpetrator, has been sentenced to 8 years. Six Apollo space flight missions between 1969 and 1972 brought back 842 pounds of lunar rocks, core samples, and regolith from the moon's surface. Most of it is stored at the Lunar Sample Facility at the JSC. This theft did not occur from the Curatorial Facility where the bulk of the samples are worked and stored.

We have completed the samples allocations through March 2003 after receipt of approval of the CAPTEM-Recommended Lunar Sample Allocation Plan by NASA Headquarters. We received 14 sample requests for the Fall CAPTEM meeting which was held at the Lunar Planetary Institute on October 27-29, 2003. The due date for sample requests is available on our curation web site (<http://curator.jsc.nasa.gov>) and is routinely the best place to find the current due date.

The transition of our Remote Storage Facility from Brooks Air Force Base in San Antonio to White Sands Test Facility in New Mexico was completed a year ago. Subsequent visits have shown that the facility is performing very well. A great deal of hard work was performed by the Curation staff, JSC security and WSTF staff in strategic planning and implementation of the plan for this move. The team has received a NASA wide group achievement award for their efforts.

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Astromaterials Acquisition and Curation at JSC

by **Carlton Allen**
Astromaterials Curator
Manager, Astromaterials Acquisition and Curation Office
NASA JSC

This has been a truly challenging year for the NASA family. The tragic loss of the Columbia crew and spacecraft is always with us, as is NASA's primary goal to resume flying humans safely in space. Within the JSC Astromaterials Acquisition and Curation Office we are facing other challenges including an expanded mandate, new samples and missions, increasing security concerns, and changes in the staff.

Mandate

NASA Policy Directive 7100.10 assigns the Johnson Space Center authority to curate the Apollo lunar samples. A recent revision, NPD 7100.10D, expands our mandate to include "the curation of all extraterrestrial material under NASA control, including future NASA missions."

Lunar Samples

NASA policy requires that a portion of the lunar sample collection must be stored at a location remote from JSC. For many years 14 percent of the collection was stored at Brooks Air Force Base in San Antonio, Texas. Last year the security status of these samples changed, as portions of the base were transferred to the city. In response, a laboratory was constructed at the NASA White Sands Test Facility in New Mexico and the Remote Lunar Sample collection was successfully relocated.

Antarctic Meteorites

The joint NASA / National Science Foundation / Smithsonian Institution Antarctic Search for Meteorites program is over 25 years old. During the 2002-2003 Antarctic summer two field teams in different parts of the continent collected a total of over 900 samples, including two new lunar meteorites.

Cosmic Dust

Stratospheric sampling flights during the past year included two campaigns to collect dust from specific comets. Missions were flown during the Leonid Shower (comet 55P/Tempel-Tuttle) in 2002 and during Earth's predicted crossing of the dust stream from comet Grigg-Skjellerup in 2003.

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FROM THE GULF COAST TO THE EAST AND WEST COASTS

by Linda Watts

A 117.628 g split of mare basalt 15475 is now on display in the Rose Center for Earth and Space, the American Museum of Natural History in New York City. This Apollo 15 rock was collected from the area of Dune Crater and was encased in the newly designed, gaseous nitrogen-containing display container at the Lunar Curatorial Laboratory. While on a trip to NASA Headquarters, Dr. Carlton Allen transported the display to the eagerly waiting AMNH curator.

"Great Scott" rock 15555, 879 is now on display at the Chabot Space and Science Center in the Gruener Astronomy Hall, Oakland, California. Chabot's "Moon Mission Team", a cross-section of scientists, educators, and operations personnel, has consulted with NASA-JSC's public affairs and curatorial staff to develop a close-up, well-illustrated, and secure exhibit. The 123.696 g lunar sample stands alone, in its museum case, near the entrance to the Challenger Learning Center (which offers a Mission to the Moon).

Rock 15555, 9.6 kg, was the largest moon rock collected up to that time. Its mass was only surpassed by Apollo 16's 11.7 kg, "Big Muley". In order to collect this mare basalt rock, Dave Scott had to create the down-on-right-knee, roll-rock-up-thigh, and hip-carry maneuver.

EMPLOYEE HIGHLIGHTS



Norma Ramirez was working in industry as an electrician for the Toshiba Int'l Company as the QC Inspector and Calibration Lab Manager when she was offered employment as a calibration tech at JSC. She began her work experience for Lockheed Martin at JSC in December of 1996. She viewed this as a opportunity to seek out new challenges in her chosen career. With Lockheed, Norma worked as a calibration lab tech for 5 years before transferring to the Astromaterials Curation facilities. The transition was a wonderful experience for her since this was the first time that she had seen any of the lunar samples and the other extraterrestrial samples that we study. She currently continues to work in a technician capacity but her primary task includes maintaining the Lunar, Meteorite, Cosmic Dust, Genesis Labs and others. When Norma is torn away from these tasks, she also does the pre-cleaning of tools and equipment for all the labs.

Norma was born and raised in the small South Texas town of Kingsville (also home of the King Ranch). She graduated high school and pursued her education at Del Mar College in Corpus Christi. After a few semesters of college, she joined the US Navy in April of 1989. She was trained at Chicago/Great Lakes as an Electricians Mate and graduated in December of that same year. She served onboard the USS Yellowstone for 3 years as an Electrician. She also served during the Persian Gulf War (Desert Shield/Desert Storm). After leaving the Navy, Norma worked for Toshiba Int'l in Houston for about 3 years before coming to JSC. She purchased a house in League City 2 months after joining Lockheed and currently resides there.

Norma has been married to her wonderful husband for 2 years. They met while working at JSC. Ted is an Altitude Tech and also works at JSC. They love to fish, camp, travel to tropical islands in the Caribbean, and spend time with their families and friends. Ted enjoys cooking and Norma enjoys watching him cook and eating everything he prepares.

We're glad to have Norma as a member of our Curation team. She has proven to be a great asset to us. Our hats are off to Norma for a job well done.

A 2001 Addition to Curation



Nancy G. Robertson conducts a wide variety of administrative and business functions in support of advanced curation development. Nancy is a native Texan who joined JSC as a cooperative education student in 1974. Her work with NASA has been in the professional administrative, financial, and management support areas at the Johnson Space Center and NASA Headquarters.

From 1988-1990, she served as the Assistant Executive Officer in the Office of the Administrator at NASA Headquarters. Returning to JSC in 1990, she was named Assistant for Education in the Office of Director managing the Center's growing involvement in local, state and national education programs. In 1994, Nancy organized and led the newly established Education Branch integrating kindergarten through post-graduate education programs formerly positioned in three separate JSC organizations. Until 2001 when she

joined ARES, Nancy was the Chief of Education and Community Support in the Office of Public Affairs.

Nancy received a BBA (Accounting) cum laude with honors from Sam Houston State University and an MBA with honors from University of Houston Clear Lake. She was elected to Alpha Lambda Delta, Alpha Chi, Gamma Beta Sigma and Sigma Iota Epsilon scholastic honor societies and to Who's Who in American Colleges and Universities.

Nancy is active in community affairs, formerly serving as the Chairperson of the Bay Area United Way Advisory Committee and the Board of Directors of Bridgeport Communities in Schools. She served as Treasurer of the Manned Space Flight Education Foundation during the development of Space Center Houston and is currently a member of the Board of Directors of the NASA College Scholarship Fund, Inc. Nancy is a recipient of the NASA Exceptional Achievement Medal and two JSC Equal Opportunity Awards.

Nancy has been to all seven continents and loves to travel for fun. Her hobbies include hunting for antiques, reading, needlework, going to Texas Aggie football games and chasing after grandchildren. She is married to Bruce Upshaw, a chemical company senior executive.

A big ARES welcome to Nancy and our hats off to her for doing a fantastic job!



Precious Treasures on Earth

by Laurie Carrillo

The “well-being” of our Lunar Rocks, one of the precious treasures on Earth, is a responsibility held by the Office of Astromaterials Acquisition and Curation of the ARES Office within the Space and Life Sciences Directorate at Johnson Space Center. Though the majority of the samples are held here at Johnson Space Center, about 114 pounds of the moon was transferred to a vault at Brooks Air Force Base in San Antonio, Texas in 1976. Recent events placed a series of new demands on the security of these lunar samples: 1) By October, Brooks was scheduled to become a city-owned base and is significantly reducing the amount of security at the base, 2) In July 2002, a safe containing lunar samples from every Apollo mission was discovered missing from JSC and 3) On September 11, 2001, our country experienced the worst terrorist attack in history. The JSC Curation team was forced to ensure the safety of the lunar rocks to a higher degree of security than had been needed in before. A new state-of-the-art facility was built at the White Sands Test Facility led by Jack Warren/Lockheed Martin, Lisa Vidonic/Lockheed Martin, Justin Kerr/NASA, and Richard Von Wolff/NASA. This was completed and received its Operation Readiness Review. As of September 20, 2002, the White Sands facility was ready to receive the samples from Brooks. Chuck Meyer/NASA, Carol Schwarz/Lockheed Martin, Andrea Mosie/Lockheed Martin and Maria Murphy/MEI did extensive work to develop a safe and effective plan to move the moon

rocks. Mark Valentine/NASA and Lisa Coleman/DYN designed the packing configuration that was used to effectively protect and prevent damage to the moon rocks and furniture. The Brooks team was responsive and assisted the JSC team as they arrived at Brooks. The JSC team including Ron Bastien, Terry Parker and J. R. Sanchez (all of Lockheed Martin) loaded all of the cabinets and moon rocks into trucks in San Antonio, TX. Dave Reece/ Three-Way Transportation effectively provided the trucks necessary for the lunar samples to be moved. Through a rigorous Risk Management Plan overseen by Cliff Kraus/SAIC, all risks involved with transporting the sample from San Antonio, TX to Las Cruces, NM were investigated and minimized. Instrument Sensor Technology Accelerometers, loaned to JSC from Robert Orens of JPL, were placed on the truck to keep a log of the vibration events the samples experienced. Through the extensive contingency plans that were created for the move, the move team was prepared for every situation they faced and utilized its predefined procedures successfully. Sandy Ogden/NASA successfully led the transportation team of the mission. A NASA security team led by Jack Mays/NASA escorted the trucks. Back home at JSC, Laurie Carrillo/JSC developed and directed an ATOMS (ARES Transporting Our Moon Safely) Mission Control, using it to keep watch on the weather as Hurricane Isidore posed a possible threat during the hours prior to the transport. Along with Mike Trenchard and Steve Waltz lending their weather tracking expertise, we maintained communication with the drivers across West Texas, and tracked the truck with its advanced QualComm tracking system as the lunar rocks traveled through West Texas. Gary Lofgren, Carl Allen, Nancy Robertson, and Eileen Stansberry oversaw all activities. Because of the fine work of the NASA, Johnson Space Center, ARES, the Astromaterials Acquisition and Curation Team, and all other contributing parties, the lunar samples were safely secured in the vault at the White Sands Test Facility.

New Chair for CAPTEM



Glenn MacPherson's 3-year term as CAPTEM Chair expired and Dr. Gary Huss of Arizona State University succeeded him at the

October 2003 meeting. Both Joe Boyce and Dave Lindstrom have approved this appointment.

Glenn MacPherson says, "Gary Huss is ideally suited to take over the committee. He has a "curator's soul", so he understands well the concerns and issues with respect to JSC. His work with presolar grains and early solar system materials means that he also understands and appreciates the importance of the Genesis and Stardust missions. He will take a very active interest in completing the new Stardust curation facility. His scientific credentials are impeccable, and as President-elect of the Meteoritical Society, he clearly has the stature necessary for the job. I have known him very well for a long

time, as a collaborator and friend, and I have the highest respect and praise for him."

The CAPTEM members include: Lindsey Keller (NASA JSC), Randy Korotev (Washington University), Chip Shearer, Lunar Allocation Chair (University of New Mexico), Steve Simon (University of Chicago) Minnie Wadhwa (Field Museum of Natural History), Barbara Cohen (University of New Mexico), Marc Norman (The Australian National University), Gary Lofgren, Lunar Sample Curator (NASA JSC), Al Brandon, Secretary (NASA JSC) and Larry Nyquist, CAPTEM Facilities Sub-committee chair (NASA JSC).



Curator's Comments *(Con't from page 3)*

A new effort has begun to produce a version of the lunar samples catalog on CD-ROM. This is a time consuming effort because in addition to reproducing the text, it is necessary to substitute original versions of the photographs for the CD version. There is no projected completion date, but we hope to have it ready in approximately a year from now.

The recent theft of lunar samples point up the need to return lunar samples for which there are no future research plans. To return samples check our web site for the instructions. Even if you are not planning to return samples soon, you should consider preparing the sample history forms (F-75, available on web site) for your samples in recognition that they will have to be returned one day.

CAPTEM's lead baton has been passed to Dr. Gary Huss of Arizona State University as Glenn MacPherson's 3-yr. term as CAPTEM chair has expired. See the article about the change in this issue.

New Missions

Three sample return missions are currently in space. *Genesis*, collecting solar wind atoms at the Earth-Sun L1 libration point, is scheduled to return to Earth in September 2004. *Stardust* will encounter comet Wild-2 in January 2004 and return comet and interstellar dust particles to Earth in January 2006. *Hayabusa* (formerly Muses-C) was launched by the Japanese Space Agency on a mission to sample asteroid Itokawa and return to Earth in 2007.

Proposal Opportunities

Ideas and proposals for future sample return missions continue to be developed. The *New Frontiers* program Announcement of Opportunity, issued this fall, includes specific requests for proposed sampling missions to the lunar farside and the surface of a comet. The next *Discovery* program Announcement of Opportunity, expected this winter or next spring, will be another opportunity for low-cost sample return proposals. A new opportunity to propose *Mars Scout* missions, including sample returns, is expected in time to support launch early in the next decade.

Security

Last year a safe containing lunar samples and meteorites was stolen from a JSC research laboratory. Thanks to a tip from a foreign mineral collector, the FBI and NASA security recovered the samples and arrested the perpetrators. As a result of this theft, physical security in the Curatorial laboratories has been increased and access to some laboratories has been curtailed.

People

Dale Browne, responsible for lunar sample loans, inventory, and security agreements with Investigators, retired after nearly four decades of NASA service.

David and Marilyn Lindstrom left JSC this fall for permanent assignments in the Solar System Exploration Division at NASA Headquarters.

Mary Drake, an Administrative Officer recently transferred from JSC's Structural Engineering Division, has taken over Dale Browne's duties and the position of Educational Samples Curator.

Kevin Righter, a planetary geologist and recent post-doctoral fellow at the University of Arizona, joined JSC as the Curator for Antarctic Meteorites.

Norma Ramirez, a Lockheed Martin employee with a background in calibration, has joined the Curatorial technician staff.

We in the Astromaterials Acquisition and Curation Office continue our core missions providing samples of extraterrestrial material to the international science and education communities and curating these unique samples for future generations. We welcome your comments and sample requests and look forward to the results of your research.

How to Request Lunar Samples

NASA policies define lunar samples as a limited national resource and future heritage and require that samples be released only for approved applications in research, education, and public display. To meet that responsibility, NASA carefully screens all sample requests with most of the review processes being focused at the Lyndon B. Johnson Space Center (JSC). Individuals requesting a lunar sample should follow the steps given below for the appropriate category of sample.

1. RESEARCH SAMPLES (including thin sections)

NASA provides lunar rock, soil, and regolith-core samples for both destructive and non-destructive analysis in pursuit of new scientific knowledge. Requests are considered for both basic studies in planetary science and applied studies in lunar materials beneficiation and resource utilization.

A. The sample investigator demonstrates favorable scientific peer review of the proposed work involving lunar samples. The required peer review can be demonstrated in either of two ways: (1) A formal research proposal recommended by NASA's Lunar and Planetary Geosciences Review Panel (LPGRP) or an equivalent scientific peer-review panel, within the past three years; (2) Submittal of reprints of scientific articles, as published in peer-reviewed professional journals that directly pertain to the specific sample requested.

B. The investigator submits a written request specifying the numbers, types, and quantities of lunar samples needed, as well as the planned use of the samples. For planetary science studies, the sample request should be submitted directly to the Lunar Sample Curator at the following address:

Dr. Gary Lofgren
ST/Lunar Sample Curator
NASA/Johnson Space Center
Houston, TX 77058-3696 USA
Telephone: 281-483-6187
Fax: 281-483-5347
gary.e.lofgren@nasa.gov

For new investigators, tangible evidence of favorable peer review (step A) should be attached to the sample request. Each new investigator should also submit a résumé.

Investigators proposing the application of new analytical methodologies (not previously applied to lunar samples) also should submit test data obtained for simulated lunar materials. New investigators who are not familiar with lunar materials should consult *Lunar Sourcebook: A User's Guide to the Moon* (G. Heiken, D. Vaniman, and B. M. French, Eds.; Cambridge University Press, 736 pp.; 1991; ISBN 0-521-33444-6) as the best available reference on the chemical and physical properties of lunar materials.

Investigators with access to the World Wide Web on the Internet also can find updated information at the following URL: <<http://curator.jsc.nasa.gov>>. The home page cited above provides links to

information of use to sample requestors.

C. The Lunar Sample Curator will research the availability of the requested samples and decide whether a unilateral action can be taken or an outside scientific review is required. Outside review is prescribed for all new investigators and for most established investigators except where returned (previously used) samples are being requested. For outside review, the Curator forwards the original request, with background information, to the Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM), a standing committee of scientists who advise NASA on the care and use of lunar samples. CAPTEM checks for favorable peer review (step A) and appropriate sample selection (step B).

D. Given CAPTEM endorsement and concurrence by NASA Headquarters, the Lunar Sample Curator will prepare a Lunar Sample Loan Agreement for signature by the investigator's institution. The agreement includes a sample security plan that prescribes precautions to minimize prospects for theft or unauthorized use of lunar samples.

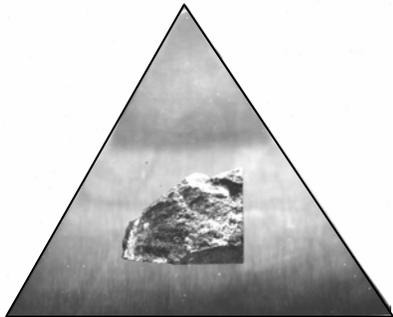
E. Upon receipt of the properly executed loan agreement, the Lunar Sample Curator prepares the authorized samples and sends them to the investigator. Quantities less than 10 grams can be sent directly by U.S. registered mail to domestic and foreign investigators.

Quantities larger than 10 grams must be hand-carried by the investigator or his/her representative.

F. Continuation as a Lunar Sample Investigator. An investigator's privilege for retention and use of lunar samples is contingent upon continued good standing with the Office of the Curator. The investigator will remain in good standing by fulfilling the following obligations: (1) Maintenance of, and adherence to, the lunar sample loan agreement and security plan; (2) Timely cooperation with annual lunar sample inventory; (3) Timely cooperation with sample recalls.

2. PUBLIC DISPLAY SAMPLES

NASA provides for a limited number of rock samples to be used for either short-term or long-term displays at museums, planetariums, expositions, or professional events that are open to the public.



Requests for such display samples are administratively handled by the JSC Public Affairs Office (PAO). Requestors located in the United States should apply in writing to the following address:

Mr. Louis A. Parker
Lunar Sample Specialist
AP/Public Affairs
NASA/Johnson Space Center
Houston, TX 77058-3696
Telephone: 281-483-8622

Fax: 281-483-4876

Mr. Parker will advise successful applicants regarding provisions for receipt, display, and return of the samples. All loans will be preceded by a signed loan agreement executed between NASA and the requestor's organization. Mr. Parker will coordinate the preparation of new display samples with the Lunar Sample Curator.

3. EDUCATIONAL SAMPLES (disks and educational thin sections)

A. Disks

Small samples of representative lunar rocks and soils, embedded in rugged acrylic disks suitable for classroom use, are made available for short-term loan to qualified school teachers. Each teacher must become a certified user of the disks through a brief training program prior to receiving a disk. Educational sample disks are distributed on a regional basis from NASA field centers located across the United States. For further details, prospective requestors should contact the nearest NASA facility as follows:

IF YOU LIVE IN:

<i>Alaska</i>	<i>Nevada</i>
<i>Arizona</i>	<i>Oregon</i>
<i>California</i>	<i>Utah</i>
<i>Hawaii</i>	<i>Washington</i>
<i>Idaho</i>	<i>Wyoming</i>
<i>Montana</i>	

NASA Educator Resource Center

Mail Stop 253-2
NASA Ames Research Center
Moffett Field, CA 94035-1000
Phone: 650-604-3574

IF YOU LIVE IN:

<i>Connecticut</i>	<i>New Hampshire</i>
<i>Delaware</i>	<i>New Jersey</i>

<i>New York</i>	<i>Maine</i>
<i>Pennsylvania</i>	<i>Maryland</i>
<i>Rhode Island</i>	<i>Massachusetts</i>
<i>Vermont</i>	
<i>District of Columbia</i>	

NASA Educator Resource Center

Mail Code 130.3
NASA Goddard Space Flight Center
Greenbelt, MD 20771-0001
Phone: 301-286-8570

IF YOU LIVE IN:

<i>Colorado</i>	<i>North Dakota</i>
<i>Kansas</i>	<i>Oklahoma</i>
<i>Nebraska</i>	<i>South Dakota</i>
<i>New Mexico</i>	<i>Texas</i>

NASA Educator Resource Center

Mail Code AH-2
NASA Johnson Space Center
Houston, TX 77058-3696
Phone: 281-483-0235

IF YOU LIVE IN:

Florida
Georgia
Puerto Rico
Virgin Islands

NASA Educator Resource Center

Mail Code ERC
NASA Kennedy Space Center
Kennedy Space Center, FL
32899-0001
Phone: 321-867-4090

IF YOU LIVE IN:

Kentucky
North Carolina
South Carolina
Virginia
West Virginia

NASA Educator Resource Center

NASA Langley Research Center
Mail Stop 400
17 Langley Boulevard
Hampton, VA 23669-4033
Phone: 757-864-9728

IF YOU LIVE IN:

Illinois *Minnesota*
Indiana *Ohio*
Michigan *Wisconsin*

NASA Educator Resource Center

Mail Stop 8-1
NASA Glenn Research Center
21000 Brookpark Road
Cleveland, OH 44135-3191
Phone: 216-433-2017

IF YOU LIVE IN:

Alabama *Louisiana*
Arkansas *Missouri*
Iowa *Tennessee*

NASA Educator Resource Center

NASA Marshall Space Flight Center
Mail Stop CD60
Huntsville, AL 35812-0001
Phone: 256-544-2849

IF YOU LIVE IN:

Mississippi

NASA Educator Resource Center

Building 1100
Mail Stop 1200
NASA John C. Stennis Space Center
Stennis Space Center, MS
39529-6000
Phone: 228-688-3506

B. Thin Sections

NASA prepared thin sections of representative lunar rocks on rectangular 1- x 2-inch glass slides, with special safety frames, that are suitable for use in college and

university courses in petrology and microscopic petrography for advanced geology students. Each set of 12 slides is accompanied by a sample disk (described above) and teaching materials. The typical loan period is two weeks, including round-trip shipping time. Each requestor must apply in writing, on college or university letterhead, to the following address:

Mary Drake
ST/Education Sample Curator
NASA/Johnson Space Center
Houston, TX 77058-3696
Telephone: 281-483-3154
Fax: 281-483-5347
mary.k.drake@nasa.gov

For each approved user, the Curator will prepare a loan agreement to be executed between NASA and the requestor's institution prior to shipment of the thin-section package.

