issues raised in a new book she has edited, *The Earth Around Us: Maintaining a Livable Planet,* published earlier this year by W. H. Freeman and Company.

Marjorie Chan, professor of geology at the University of Utah, will present another aspect of Earth science in the cities in her poster on "Geoantiquities in the Urban Landscape: Earth History Records in the Cities."

Chan enjoys watching "The Antiques Road Show," a popular public television series about finding treasures in attics. She said the public's interest in historical treasures should also include preserving "geoantiquities."

She and some colleagues devised that term in part because it sounds like cultural antiquities.

Geoantiquities, according to Chan, "are natural, geologic records of Earth history and environmental change at local and regional scales, with important global implications."

In some regions, geoantiquities might include landscape features shaped by glaciers or landslides, for instance. Near Chan's home in Salt Lake City, special geological features include deltas, bars, spits, and other shoreline geological features remaining from ancient Lake Bonneville, which existed from about 32,000 to 14,000 years ago.

Geoantiquities, she said, might contain irreplaceable data about scientific and environmental information, such as Earth surface processes, natural hazards, and climate change. These features "are world-class archives of Earth's history," she said. "When geoantiquities are lost, we lose basic scientific information."

However, under pressure from urban sprawl, more and more of these geoantiquities are disappearing beneath bulldozers and development. In Salt Lake City, Chan watched as some geological features she used to show her students were covered over by a golf course.

Chan said there is no mechanism for protecting geological features in urban areas. She hopes that the push to protect geoantiquities can begin to change that.

"We can't save every bar and spit and alluvial spit, but [we can] develop some criteria for management," she said. "If we get one site preserved, we feel we will accomplish a lot."

A number of scientists also will focus on the potential impact of natural hazards on cities. Domenico Giardini of the Institute of Geophysics in Zurich, Switzerland, will present a paper on "Earthquakes and Megacities," and Giovanni Orsi of the Osservatorio Vesuviano in Naples, Italy, will speak on "Facing Volcanic and Related Hazards in Neapolital Areas."

Gerald Hebenstreit, an oceanographer with the Science Applications International Corporation in McLean, Virginia, will discuss "Tsunami Impact and Mitigation in Inhabited Areas." According to Hebenstreit, only about 8–12 tsunamis occur worldwide each year, and most of these are relatively small. However, the topic of tsunamis has received a wave of interest following the devastating July 17, 1998, event that killed thousands of people in Papua New Guinea. Earlier this month, *Geology*, a magazine published by the Geological Society of America, published an article about the possibility of tsunamis along the mid-Atlantic coast of the United States.

Hebenstreit said that the potential for tsunamis appears greater along parts of the U.S. Pacific coast, because of the bathymetry, and that some urban areas could be affected. However, he added that the article by N. W. Driscoll, J. K. Weissel, and J. Goff [*Geology*, May 2000] has provoked a great deal of discussion among scientists.

Hebenstreit said that sophisticated tools—including side scanners, and computers that can model tsunami wave action in much higher resolution than in the past—are helping scientists to gain a better understanding about tsunamis and their potential threat to people and urban areas.

For further information about the AGU sessions, visit the AGU Web site: http://www.agu.org/meetings/sm00top.html.

Randy Showstack, Staff Writer

SECTION NEWS

PLANETARY SCIENCES

Bids Requested for Genesis Mission Analytical Facilities

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The Genesis Discovery mission, to be launched in January 2001, will expose ultrapure materials to the solar wind for about 2 years and then return this sample to Earth for isotopic and chemical analysis in terrestrial laboratories.

Sample return missions use the best available instrumentation to achieve mission science goals. To complete the Genesis science objectives, advanced instrumentation that surpasses present laboratory sample analysis capabilities is required. Advanced Analytical Instrumentation Facilities (AAIFs) will be created for the mission to ensure that the best analytical instruments are used. This approach also enables broad participation by NASA scientists in solar wind sample return analysis.

AAIF funding is included in the Genesis Project budget. However, to guarantee that the best ideas will be used, the AAIF procurement activities will be based on open competition through peer-reviewed bids.

Here, "Facilities" refers to analytical instruments operated and maintained by a professional staff at one location but available to NASA-approved "user" scientists for specific studies of returned solar wind materials. Nuclear physics accelerators and telescopes have used this approach successfully for many years. "Approved" users will be affiliated with the research program of a principal investigator approved by NASA's Cosmochemistry Discipline Science program. Collector materials will be allocated to approved users by the Genesis Sample Allocation Committee.

Following a tradition set by lunar sample analysis, non-U.S. scientists can be approved for AAIF access based on "sample only" proposals. The detailed analytical procedures for specific studies are the responsibility of the user in consultation with the AAIF staff on questions of feasibility. The AAIF staff maintains and operates the instrument at peak performance levels and cooperates with outside users regarding the actual measurements.

Facilities Requirements

Potential AAIF principal investigators must:

- demonstrate adequate sensitivity for returned solar wind collector analysis using less than 130 cm^2 of collector material per analysis;
- demonstrate that accuracy requirements can be met (e.g., see Table 2 of the Science Requirements Document at http://www.gps.caltech.edu/genesis/genesis3.html);
- propose costs within the overall AAIF budget;
- agree to collaborate with all approved outside users in specific analytical tasks; and
- establish the AAIF in the United States.

The AAIF staff can also request and analyze collector materials as part of their own in-house research efforts. If there is difficulty in meeting user time requests, a three-person scheduling committee shall be formed; two of its three members would be from outside the location in which the AAIF resides.

AAIF selection will be based primarily on the ability of the proposed facility to meet the requirements above. Secondary selection criteria are the cost and management plan, including matching funds for facility development, and the applicability of the facility for general extraterrestrial materials analysis.

Schedule

Table 1 summarizes the AAIF selection schedule. Bids in the form of detailed proposals will be accepted from universities, government laboratories, and private businesses.

Table 1. Advanced analytical instrument facilities selection schedule

November 1, 1999	AAIF selection process publicized
May 15, 2000	Final proposal guidelines released by LPI
August 1, 2000	Letters of intent due to LPI
September 1, 2000	Review panel selected
October 1, 2000	Review panel selects external reviewers
November 1, 2000	AAIF proposals due to LPI
January 15, 2001	Funding decisions announced
February 15, 2001	Beginning of Genesis Phase E
March 1, 2001	AAIF funding initiated
February 15, 2007	End of Genesis Mission

Proposal review will be managed by the Lunar and Planetary Institute (LPI) following well-established peer-review processes of the NASA Planetary Division Discipline Science programs that utilize both external and panel reviews.

Based on letters of intent and a preliminary summary statement of the proposed facility, a review panel will be selected by the LPI director with advice from the discipline scientist of NASA's Cosmochemistry Program. The review panel will be drawn from institutions not represented in the letters of intent. The number and type of facilities funded are at the discretion of the review panel. Funding decisions of the panel, transmitted to the LPI director, are final and not subject to review.

Neither the mission principal investigators nor co-investigators will be members of the review panel, and both are eligible to participate in and submit AAIF proposals. AAIF funding will be held by the Johnson Space Center (JSC), but since this is just a contract administrative responsibility, scientists from JSC are eligible to submit facilities bids.

Available Funding

For FY 2001, $4.3 million is available for capital investments. An additional $500,000 per year in installation and operational funding is available through FY 2007, the duration of the Genesis mission.

Technical Oversight

Following capital investment funding in the first year, funds will be provided to the AAIF principal investigators for 2 additional years to support AAIF installation and testing. Performance will be evaluated at 6-month intervals through written reports to the review panel, which would be reconstituted as a Technical Advisory Committee. The Technical Advisory Committee reports to a contract monitor appointed by the LPI Director. If progress is not satisfactory, the Advisory Committee would visit the site and recommend corrective actions.

Additional information about the Genesis mission and sample analysis can be obtained from Web site: http://www.gps.caltech.edu/genesis/genesis3.html. More specific questions can be addressed to burnett@gps.caltech.edu.

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H Y D R O L O G Y

Rinaldo Receives 1999 Research Award

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Andrea Rinaldo received the 1999 Research Award, presented by the Hydrology Section during the 1999 AGU Fall Meeting. The award recognizes an outstanding contribution to the science of hydrology.

Citation

"It is indeed a great pleasure to introduce Professor Andrea Rinaldo, this year's winner of the Research Award of the AGU Hydrology Section. Andrea is eminently qualified for this award for his outstanding contributions to the science of hydrology. There are two major areas of our science where his research work has been truly exceptional and path-breaking. The first one is the area of transport of solutes in porous formations, and the second is that of hydrogeomorphology. In the first area, Andrea, with students and collaborators, has provided the high-accuracy numerical studies that constitute the benchmark against which many analytical approximations of solutions to the stochastic transport equation are now routinely compared. Of great interest in this area is also his recent development with Bellin and Rubin of an Eulerian-Langragian approach to the simulation of advective transport in randomly heterogeneous porous media. These are only examples of an extensive and impressive oeuvre, which covers topics like land subsidence and the organization of soil moisture fields. In the words of Professor Shlomo Neuman, 'Andrea has made major contributions to our understanding of both reactive and nonreactive solute transport through randomly heterogeneous porous media, and his high-caliber work and dedication deserve no lesser recognition than this research award.'

"Andrea's contributions to hydrogeomorphology place him, according to Professor Rafael Bras, 'among a very selected few and is enough to deserve worldwide recognition'.... 'his work on self-organization, optimal channel networks, and thermodynamic analogies in the evolution of rivers is truly extraordinary'.... 'his enthusiasm and energy is enough to light up even the most tired intellect.' I fully agree with Rafael. I first became familiar with Andrea's work when reading his series of papers in *Water Resources Research* on geomorphological dispersion and mass response functions. I remember the excitement they transmitted, a natural result of the originality of the ideas and a truly exceptionally creative mind in love with research and the exploration of new paths. From that moment on, Andrea has been in the forefront as a world leader in the search for the laws describing the structure of river basins and their links with the hydrologic response. Most lately, he has also been involved with the structure of tidal networks where he is again pioneering new and creative avenues. Andrea's work in hydrogeomorphology, in the words of Professors William Dietrich and Alan Howard, is 'forcing a debate about which fundamental processes drive landscape form, which features are ubiquitous, and what approaches to modeling are worthwhile.' Because of this work, 'now physicists, engineers, geomorphologists, geophysicists, and others are pursuing river network analysis.' I share Bill's perspective that Andrea's papers 'will be seen in the future as a major contribution in explaining self-organizing tendencies in nature, and in landscapes in particular.'

"Andrea Rinaldo is a unique researcher in the creativity, intensity, enthusiasm, and search for important problems that he brings into his work. His contributions have impacted hydrology deeply and he has distinguished himself