

Updates were also given on the ICDP-sponsored drilling into the Lake El'gygytyn impact crater (northeastern Russia), currently in progress. Also featured was a symposium and open forum discussing the recently proposed impactite nomenclature scheme, coauthored by Dieter Stöffler (Humboldt University Berlin) and Richard Grieve (Natural Resources Canada) and submitted on behalf of the

International Union of Geological Sciences (IUGS) Subcommission on the Systematics of Metamorphic Rocks. Recommendations and comments by LMI IV attendees are being summarized for submission to the IUGS nomenclature authors. An archive of the LMI IV meeting abstracts is available at <http://www.lpi.usra.edu/meetings/lmi2008/>. Conference contributions will be published in 2009 as

a Geological Society of America Special Paper.

—JARED MORROW, Department of Geological Sciences, San Diego State University, San Diego, Calif.; E-mail: jmorrow@geology.sdsu.edu; ROGER GIBSON, School of Geosciences, University of the Witwatersrand, Johannesburg, South Africa; and WOLF UWE REIMOLD, Museum of Natural History/Leibniz-Institute, Humboldt University Berlin, Germany

ABOUT AGU

Gerald J. Wasserburg Awarded 2008 William Bowie Medal

Gerald J. Wasserburg was awarded the 2008 William Bowie Medal at the AGU Fall Meeting Honors Ceremony, held 17 December 2008 in San Francisco, Calif. The medal is for "outstanding contributions to fundamental geophysics and for unselfish cooperation in research."

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Citation

It is a great pleasure to give the citation for the 2008 AGU William Bowie medalist, Gerald ("Jerry") J. Wasserburg. His work on radiogenic isotope geochemistry has had a profound effect on Earth and planetary sciences and astrophysics. Jerry's Ph.D. thesis tried to determine the branching ratio of ^{40}K decay, and the ^{40}K - ^{40}Ar dating of igneous rocks and sediments. Then he made major contributions to ^{87}Rb - ^{87}Sr and U-Pb geochronology, cosmochronology (^{129}I), and the significance of K/U ratio difference between the Earth and primitive meteorites and its implications for the Earth's thermal history. Jerry constructed the first programmable high-precision mass spectrometer, the Lunatic-I, to work on lunar samples returned by the Apollo program. The precision of this instrument opened up a wide range of new problems for study and led to the first precise determination of the solar system's initial $^{87}\text{Sr}/^{86}\text{Sr}$ value based on basaltic meteorites. This value is still in use and is essential for modeling planetary evolution. In 1969, after the Allende meteorite fall in Mexico, Jerry was among the first to collect pieces of it. He found the Allende white inclusions to have lower initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios than the basaltic meteorites and to be the earliest objects formed in the solar system. Concurrently, work on long- and short-lived radionuclides showed that the long-lived chronometers directly date the mean age of the galaxy. Work on the U-Pb system in lunar samples combined with ^{87}Rb - ^{87}Sr and ^{40}K - ^{40}Ar age data led him to first propose the "terminal lunar cataclysm" at ~3.9 billion years ago. Then the ^{147}Sm - ^{143}Nd system was developed for a variety of terrestrial applications, forming the cornerstone of modern geochemistry and understanding the chemical evolution of the Earth's deep interior. Further work on

the white inclusions led to the discovery that short-lived ^{26}Al had been present in the early solar system, implying an injection of fresh nucleosynthetic material into the solar system's parental molecular cloud. Measurable isotopic anomalies in heavy elements (Ca, Ti, Ba, Sm, Nd) found in so-called fractionated and unknown nuclear (FUN) white inclusions provided direct evidence for incomplete mixing of presolar nucleosynthetic components and survival of some of them in the early solar nebula. His development of precise ^{230}Th and ^{187}Re - ^{187}Os chronology provided important tools in the fields of paleoclimatology and mantle geochemistry, respectively. Jerry put forward a new way of interpreting the abundances of the now extinct nuclides in the early solar system by inferring that two distinct supernova sources contributed to the inventory of the isotopes in the interstellar medium over the history of our galaxy. Of course, as the mark of a great leader, Jerry says he could not have done all this alone. He acknowledged this best in the abstract of his Crafoord Prize paper, comparing himself to Tom Sawyer from Mark Twain's book: "My presence here is due to an ability to attract young talent to help whitewash the fence..." In recruiting these painters, many of them immigrant laborers, he trained and inspired a new generation of isotope geochemists who are continuing his work around the world. In summary, it is hard to imagine where the field of radiogenic isotope geochemistry and cosmochronology would be today without Jerry. In 1986 he and Claude Allegre were awarded the Crafoord Prize for pioneering work on isotope geology. He was also awarded the Goldschmidt Medal in 1977 for his contributions to the field of geochemistry. He is an excellent choice for AGU's highest honor, the Bowie Medal.

—STEIN B. JACOBSEN, Harvard University, Cambridge, Mass.



Gerald J. Wasserburg

Response

Mr. President, members of the Union, ladies and gentlemen: I am most pleased and honored to receive the AGU William Bowie Medal. I thank Stein Jacobsen for his most generous presentation and the conominators for so convincing the council. I was instructed by AGU officers to give an oral acceptance that is "informal and light" (which you will hear) and a lengthy one that will appear in *Eos* that no one will read.

I have spent most of my career developing instruments and techniques with my colleague Dimitri Anastassiou Papanastassiou for the purpose of making high-precision, high-sensitivity measurements of isotopic abundances. This work, in the "Lunatic Asylum" Laboratory at Caltech using the Lunatic-I spectrometer, established a standard of performance that guided the field for 30 years. It was recently acquired by the Smithsonian Institution for archiving (or internment!).

My efforts have been devoted toward measurement, observation, modeling, and theory. Usually my work was toward addressing what I thought was a well-defined problem. It is the interplay of these different aspects that has led me to recognize connections between different problems and very different fields—this has been most stimulating and gratifying to me. It has led to new and exciting endeavors, often in surprising directions. I have always

avoided “karaoke” science and recommend such avoidance to all scientists.

Earlier this year I had dinner with some old friends from Leningrad while visiting the physics department at the University of Minnesota. The granddaughter, a high-school senior and just turning 18, was at the table. I asked her what she found most interesting in school. She replied, “Not much.” I asked further, “What do you want to do when you grow up?” She responded, “Why do you ask me this?” I said, “You are just turning 18 and I have just turned 81. I need some guidance or direction from you.” She is quite bright and responded, “You should write a book on a subject about which you know nothing!” Well, that is what I have been doing most of my life. I have had the privilege and pleasure of working with brilliant, dedicated young people who interact with me, discuss with me, argue with me, criticize me, tolerate me, and work toward trying to understand something of interest in nature. It is this lust for trying, often very hard, to understand something of nature that is the driving force. The idea that maybe, maybe,

I will understand something gives me a high, even if it is not new. If I hope that it is really something new, then I am elated! The interrelationship between 18 and 81 is not just a switch of digits. It is the interplay between interested players of different ages and vitalities and skills, dedicated to trying to understand. That is both exciting and rejuvenating. It is my belief that whatever I am working on right now is the most important thing I ever did. I recently sent an e-mail to my colleague Yong-Zhong Qian in Minnesota about a possible new project. He responded, “We just got the proofs of our article; let us get that finished. Then we can talk about a grand new adventure.” The new problem is always the most exciting problem.

I have had the privilege of working with brilliant young people who play that game. It is continuing this activity that keeps part of me always closer to 18 than to 81. That is the fountain of youth—drink from it!

There is one other issue I will comment on. Work on selected advisory bodies to branches of government is an important public service. It is also extremely

educational. It gives one a broader view of the scientific and technical enterprises of the world and, if one does not just focus on his own area of special interest, leads to a better understanding of science, science management, the structure of government, and the assignment of resources. One comes to recognize three great truths of science management: (1) The primary function of any agency of government/industry is to obtain or maintain the highest possible level of long-term funding, independent of the real scientific or technical virtues of a program, or of national need. (2) If you work at it very hard, it is sometimes possible to get the vector of policy actions closer (by, say, a milliradian) to an objective that may have real scientific virtue. (3) Sometimes there are program managers who focus great effort at identifying and supporting truly innovative work. They are the individuals who make the system work and help science and technology progress.

—GERALD J. WASSERBURG, California Institute of Technology, Pasadena

Special Presentation: Bras Awarded 2007 Robert E. Horton Medal

Rafael L. Bras was awarded the 2007 Robert E. Horton Medal during a special presentation at the AGU Fall Meeting Honors Ceremony, held 17 December 2008 in San Francisco, Calif. The medal is for “outstanding contributions to hydrology.”

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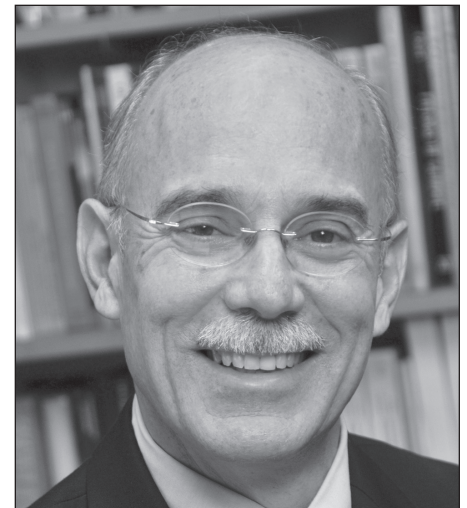
Citation

I am extremely happy to introduce Rafael L. Bras, winner of the 2007 AGU Robert E. Horton Medal. There is no doubt in any hydrologist’s mind that Bras is superbly qualified for this award. His combination of breadth and depth in the coverage of multiple fields in the hydrologic sciences has earned him a place among the most distinguished hydrologists of the past half century.

Rafael is dean of engineering and distinguished professor of civil and environmental engineering at University of California, Irvine. Until recently he was the Edward Abdun-Nur Professor of Civil and Environmental Engineering at Massachusetts Institute of Technology (MIT), where he also had a joint appointment in the Department of Earth, Atmospheric, and Planetary Sciences. His leadership in the hydrologic sciences has been superb. He is the author of two textbooks widely used throughout the world and of over 160 papers in major journals with many more in books and conference proceedings. This is indeed an outstanding scientific production; nevertheless it wouldn’t mean much if it were not for the truly magnificent quality of Rafael’s

contributions. It is marvelous how he covers such a wide range of topics in water science and technology with the impressive depth of knowledge and creative thinking that he displays in all of his work. I had the privilege of being his Ph.D. advisor and remember very well that my recommendation when I left MIT, to the then department head, Peter S. Eagleson, was to bring Rafael back from Puerto Rico to take my position. I assured Pete on how much the Institute would win with the trade! I am proud that I was indeed correct in my prediction and that Rafael has become a world leader of the field and a source of inspiration and pride for MIT, the University of California at Irvine, and his friends.

Without going into full details about his multiple and outstanding research contributions, I want to mention that Rafael has made pathbreaking research in hydrologic network design, urban storm water management, forecasting of hydrologic series, rainfall modeling, optimal operation of water systems, irrigation control, soil-atmosphere interaction, ecohydrology, and the fractal structure of drainage networks. In all of these areas, Rafael has left a permanent impact throughout research that is uniformly excellent, characterized in all cases by a wonderful choice of problems, and full of creative and imaginative ideas.



Rafael L. Bras

Rafael’s excellence in research has brought him numerous distinctions nationally and internationally. In the United States he has received multiple awards from the American Society of Civil Engineers and the American Meteorological Society. He is also a member of the National Academy of Engineering and a recipient of the Clarke Prize, for outstanding achievement in water sciences and technology. The American Geophysical Union has distinguished him with the Hydrologic Sciences Award and the James B. Macelwane Medal. The number and quality of his students is also impressive. They are all over the world occupying leadership positions in academia, major corporations, and government organizations.