

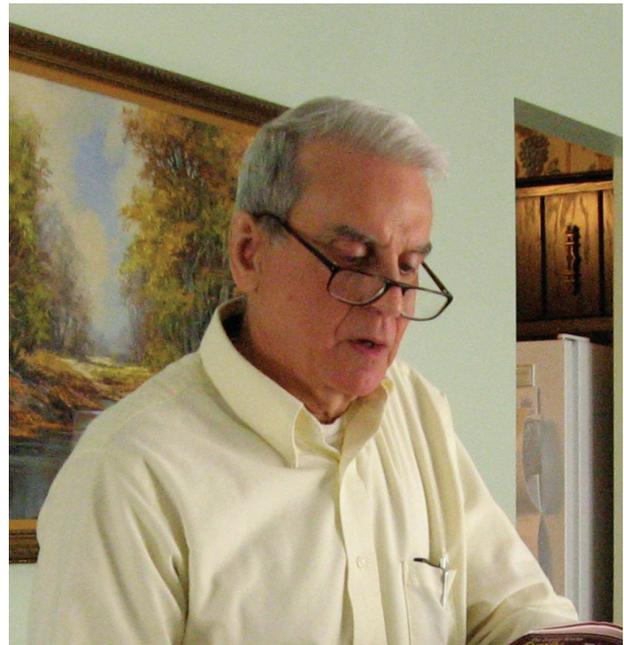
Award

2009 Leonard Medal for Lawrence Grossman

Ladies and Gentlemen! (Mesdames et Messieurs!)—It is with great pleasure that I introduce the 2009 Leonard Medalist, Prof. Lawrence Grossman, refractory inclusion maven and cosmochemist par excellence. Larry is best known for his detailed calculations of the condensation sequence of the minerals from a gas of solar composition, and for his extremely thorough studies of the composition and origin of refractory inclusions in carbonaceous chondrites.

Larry was born in 1946 (a distinction he shares with George W. Bush, a fellow baby boomer) to a family of Eastern European extraction in Toronto, Canada. Larry received his PhD at Yale University in 1972 under the direction of Karl Turekian, leading to publication of two very influential papers. His classic 1972 paper on the condensation sequence of minerals from a gas of solar composition provided the most rigorous equilibrium calculations of the expected mineralogical composition of nebular condensates. This was followed by a paper in 1973 presenting instrumental neutron activation analysis (INAA) results for Ca-Al-rich inclusions (CAIs) from, at that time, recent CV chondrite fall, Allende (1969), which established that CAIs have compositions consistent with the earliest condensates in the solar nebula. In July 1972, Larry Grossman joined the faculty of the University of Chicago. Those were exciting days for CAI research: Larry was a co-author with Bob Clayton and Tosh Mayeda on the first paper to recognize oxygen isotope anomalies in meteorites, with Allende CAIs exhibiting the largest ^{16}O anomalies. This was followed shortly by the discovery of excess ^{26}Mg , the least radiogenic $^{87}\text{Sr}/^{86}\text{Sr}$, and FUN anomalies, in Allende inclusions by Wasserburg's group at Caltech. Recognition of Larry's early work came from the Geochemical Society (Clarke Medal, 1974), the Meteoritical Society (Fellow, 1976), and the American Geophysical Union (Macelwane Award, 1980). Larry began a systematic program of extracting, characterizing, and analyzing refractory inclusions from Allende, subsequently extended to other chondrites, which resulted in over 200 publications.

In addition to the many petrological studies of CAIs, Larry Grossman remains the foremost authority on the condensation of elements from solar gases. Over the past decade or so, working with Shige Yoneda, Denton Ebel, and Alex Fedkin, he incorporated thermodynamic solution models from the work of Berman and the MELTS model of Mark Ghiorso (both developed for terrestrial petrology) into codes used for the theoretical study of the evaporation



Prof. Lawrence Grossman.

and condensation of CAI and chondrule compositions in solar gases; the condensation of vapor from the K-T boundary impactor; and the condensation of carbon-rich gases from a supernova to form presolar graphite, etc.

Larry Grossman's impact has been in the area of meteoritics, and the formation of the solar system. Entire sessions of the Lunar and Planetary Science Conference focusing on CAIs and the early solar system have been an annual tradition as long as I have been in the field (20 years). He has trained 18 postdocs during his career, many of whom are now well-known members of our community: Andy Davis (now a full professor at University of Chicago), Glenn MacPherson (Director of Mineral Sciences, Smithsonian Institution, U.S. National Museum), Shigezuki Yoneda (curator of meteorites, Japan), Steve Simon (University of Chicago), and Denton Ebel (associate curator of meteorites, American Museum of Natural History, New York), to mention a few. The curators of two of our major meteorite collections (Smithsonian and AMNH) received their induction into meteorite research in Larry's group.

When I joined the faculty at Chicago, Larry advised me that if I wanted to succeed I would need to learn some

Yiddish. He proceeded to teach me the appropriate Yiddish words to describe university administrators, some of my other colleagues, and for numerous other occasions in life. However, when thinking of some Yiddish words to describe him, I realized what a gap he had left in my education. Nowadays, thanks to Google, even a linguistic klutz like me can venture a phrase or two of Yiddish, so beware of what follows.

Larry Grossman is an active researcher, producing high quality papers on the petrology of meteorites (with Steve Simon), and on the condensation sequences of meteoritic minerals (with Alex Fedkin). Since last year, his group has produced two major papers combining thermodynamic condensation calculations with inputs from nebular models to provide the most erudite and sophisticated treatment of the redox state of chondritic materials yet produced. Larry's papers do not make for light reading. They are densely packed with information and contain the thorough detail that we have come to expect from him. The closest Yiddish word for such a work is a megillah.

Larry is a very dynamic, incredibly organized, and extremely demanding, teacher. He used all these talents to produce his best graduate student, John Beckett (PhD 1986). In my days at Chicago, Larry was a dominant personality at the departmental coffee breaks, holding forth on politics (conservative), the stock market (invested), and baseball (avid White Sox fan). He has an intense honesty, a remarkably sharp intelligence, a quick (and merciless) wit, a deep loyalty, and he suffers no fools. The Yiddish word for this is a mensch.

Certainly, few questions are of greater fundamental importance in meteoritics than the issue of the equilibrium condensation sequence. So, dear colleagues, I present to you the mensch who wrote the megillah on condensation in the solar system as the 2009 Leonard Medalist.

Munir Humayun

Department of Geological Sciences
Florida State University
1800 E. Paul Dirac Drive
Tallahassee, FL 32310, USA
