

Presentation of the Mineralogical Society of America Dana Medal for 2002 to Michael F. Hochella Jr.

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President Ewing, members of the Mineralogical Society of America, friends and guests. It is a pleasure to present to you the recipient of the Mineralogical Society of America Dana Medal for 2002, Dr. Michael F. Hochella, Jr., of Virginia Tech. *The Dana Medal is intended to recognize continued outstanding scientific contributions through original research in the mineralogical sciences by an individual in the midst of their career. The Mineralogical Society of America Dana Medal was established in 1998 and named in 2000 in honor of the legendary contributions by James Dwight Dana and Edward Salisbury Dana to the science of mineralogy.* Mike Hochella carries on the legacy of these mineralogical pioneers through his own outstanding contributions to the science of mineralogy.

Mike Hochella received his Bachelors and Masters degrees from Virginia Tech, and his Ph.D. from Stanford University, where his supervisor was another Virginia Tech alumnus and former President of the Mineralogical Society of America, Gordon E. Brown Jr. After working for a short time as a Senior Scientist at Corning Research, Mike joined the faculty at Stanford and remained there until 1992, when we were successful in recruiting Mike to join the faculty at Virginia Tech. This event assured that Virginia Tech would maintain its position of prominence in the mineralogical sciences that was established by Mike's teachers and, later, colleagues at Virginia Tech, Don Bloss, Paul Ribbe, and Jerry Gibbs—all outstanding mineralogists and former Presidents of the Mineralogical Society of America.

The Dana Medal is a mid-career award, and the quantity and, especially, the quality of Mike's contributions are indeed exceptional for a mid-career scientist. The significance of these contributions is enhanced further when one considers that Mike is actually early in his "mid-career" phase. For those of us in the science, this is great news because it means we can look forward to many more years of novel and exciting scientific advances from Mike, his students and co-workers.

While Mike's research covers a broad spectrum of mineralogy and geochemistry, all of his work involves the application of the most advanced analytical techniques and theoretical models to solving fundamental problems in the earth sciences. Mike has been one of the pioneers in applying modern analytical techniques in mineralogy. He was one of the first mineralogists to utilize Auger and x-ray photoelectron spectroscopy to study the composition and bonding of mineral and silicate glass surfaces, as well as the dissolution of minerals. Mike led a research effort that used Auger microscopy and TEM to unravel the chemical and mineralogical nature of gold in pyrite in the economically important Carlin-type (or "invisible gold") de-

posits. Using state-of-the-art surface analysis by laser ionization mass spectrometry, Mike and Tracy Tingle tackled the politically-charged issue of mantle hydrocarbons, and showed conclusively that carbon in mantle xenoliths was not consistent with the formation of deep methane that was being proselytized by Professor Thomas Gold and his colleagues. Mike and his students carried out some of the first STM and AFM studies of mineral surfaces before and after reactions with metal-ion containing aqueous solutions. The resulting STM images of metal oxide and metal sulfide surfaces showed, for the first time, remarkable atomic level detail about surface defects and surface reaction products. Mike and his students have gone on to become the world leaders in scanning force microscopy studies of mineral surface geochemistry. More recently, Mike and his students have begun to develop a fundamental theoretical framework to interpret surface reaction processes. These first-principle quantum chemical calculations are providing valuable and unexpected insights into fluid-mineral interactions at the molecular scale.

While Mike Hochella's scientific contributions are well known to mineralogists and geochemists, and all would agree that Mike has been an extremely successful scientist, it is noteworthy that his success has not come at the expense of his students, post-docs, co-workers and family. Mike maintains a balanced lifestyle and makes sure that he allows sufficient quality time to spend with his children Michael and Katherine, and wife Barbara. Mike recognizes and values the need for students to not become consumed by their work, and encourages his students to work hard, be the best scientist that they can be, but also to have a life outside of the geosciences. All who know Mike agree that he is an uncommonly generous person and considerate of the needs and desires of his students as individuals. I would be remiss if I did not acknowledge these qualities that make Mike not only a great advisor of students, but also a valued and respected colleague.

Mike treats his students as equals and professionals, and provides mentoring to help them develop as scientists. Mike lets his students come up with their own projects. While he provides valuable guidance about which projects won't work or that nobody cares about, he puts enormous faith in the creativity of his students. Many of the crazy ideas he allowed his students to pursue have ended up breaking new ground. It does not bother Mike to sometimes take chances. He is never controlling, but rather works hard to motivate his students, without pushing too hard. Mike recognizes that each student's circumstances are unique. If a graduate student has a family, Mike encourages them to make time for family, and he recog-

nizes that there may be periods of time when external commitments result in lower productivity from the student than he would like. Mike does not adhere to a “one size fits all” philosophy but, rather, lets each student develop according to his or her own abilities and circumstances. This humanitarian approach has clearly been successful, as evidenced by the quality of Mike’s current and former students, many of whom who have gone on to become respected scientists and educators in this country and abroad.

The care and attention to detail that characterize all of Mike’s activities is illustrated by a comment that was provided by one of Mike’s former students, who described her earliest memory of working with Mike in the lab. Mike was teaching her how to operate the XPS, and he was very systematic and methodical in explaining each step, ... close this, because.... open that, because.... this does that and that does this.... turn that up very slowly because... The student quickly gained confidence that she could operate the instrument because Mike completely believed in her ability to do so and explained everything so clearly along the way that nothing was a mystery. This is a fine example of the way in which Mike attacks all scientific problems—carefully, methodically, systematically. The student concluded her comments by saying that she felt like she was learning to fly an airplane—this, of course, his makes perfect sense because one of Mike’s passions in life, beyond science, is flying airplanes.

In closing, I would like to tell a story that was sent to me by another student, who shall remain anonymous, that in many ways is characteristic of Mike Hochella, the person. We all know that Mike adheres to the highest ethical and professional standards, and would never intentionally do anything that is illegal

or unprofessional. On the other hand, we also know that Mike is very trusting of his friends and close colleagues, and believes that no one would ever lead him astray. Well, several years ago, Mike was attending a conference at Penn State when some friends asked Mike if he would like to go fly fishing. “Of course,” Mike replied. So Mike and a few others went off to the local stream to fish for trout and Mike was having a grand old time—although not catching any fish. When Mike asked one of the people who went along why she wasn’t fishing, her reply was “I don’t have a fishing license,” at which point, Mike’s eyes bugged out and he exclaimed, “You mean, you need a license to fish?” He promptly pulled out the fishing rod, while his “friends,” sensing his concern and uneasiness, started regaling him with stories of huge fines and overnight jail stays with Bubba for fishing illegally. Everyone thought it was quite amusing that Mike didn’t know he needed a license to fly fish—he had complete trust in his “friends,” and could not imagine that they would lead him astray!

All jocularity aside, it is clear that James and Edward Dana would be pleased to see this award, named in their honor, being presented to Mike Hochella. They would be comfortable knowing that the award has gone to not only an outstanding mineralogist, but also to someone who has worked tirelessly to promote the Society and its science. They can rest assured that with practitioners of the quality of Mike Hochella, the future of mineralogy is in capable hands.

Mr. President, members of the Society, and others, it is with great pleasure that I present to you the recipient of the Mineralogical Society of America Dana Medal for 2002, Michael F. Hochella, Jr.