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Acceptance of the Mineralogical Society of America Award for 1988

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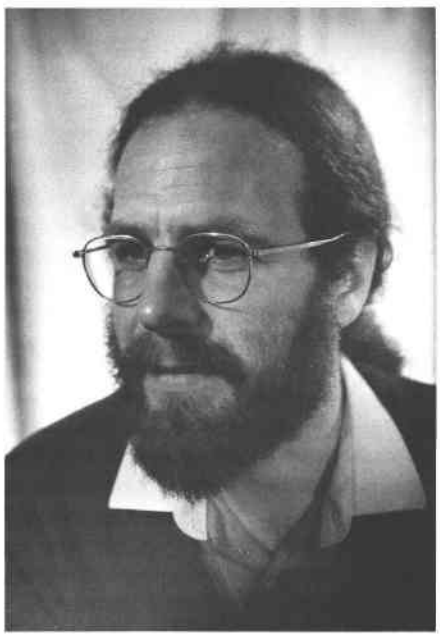
A Golden Age of Mineralogy



These are exciting times in mineralogy. We speak so easily of silicate perovskite as being the most abundant mineral in the Earth, yet that realization has only emerged in the past year or two. Similarly, it is now possible, but only as of the past few years, to experimentally reproduce essentially the complete range of pressures and temperatures existing in our planet; in fact, reaching pressures far in excess of those at the center of the Earth. Looking in other directions, we see fascinating developments in the study of biominerals, for example. The fact that organisms ranging from bacteria to whales so commonly produce magnetic minerals is truly amazing. The possible ramifications extend from biology and evolution all the way to paleomagnetism. And surely one of the greatest accomplishments in applied mineralogy is the recent discovery of the high-temperature superconducting oxides. As far as I am concerned, last year's Nobel prize in physics was awarded for mineralogical research pure and simple.

What about the future? As mineralogists, we are working on some very novel materials, including silicate and other glasses that are produced without melting—actually, without even heating the crystalline form! Also, I believe that we are on the verge of discovering, that is, experimentally synthesizing for the first time, what is probably the most abundant phase in the universe: metallic hydrogen.

As you can see with just these few examples, we are in a golden age of mineralogy. You may have noticed that I have not described a single mineral, in the sense of a naturally occurring crystalline phase produced by inorganic processes. Instead, I have described synthetic materials, even analogue compounds of those that might hypothetically occur in the Earth; or I have mentioned amorphous phases, or then again phases that are biologically produced. Yet these are all in the realm of mineralogy. Our interest, after all, is in better understanding the world around us, and that often involves studying mineral-like substances. These can range from technologically interesting materials to the crystals inside the Earth, or even inside our own bodies.

The recent advances in mineralogy are phenomenal. They include theoretical as well as observational and experimental work. It is with this sense of optimism, of the excitement in our field, that it is a special honor to have one's work recognized as being of mineralogical significance. I am very pleased indeed to receive the MSA award.

But this is a terrible award on two counts! First, it is not for past accomplishments but for future accomplishments, for potential. What happens if I wake up one morning devoid of any scientific ideas from then onward? Perhaps this would not be altogether bad: I can already hear some of my colleagues saying, "That Jeanloz is finally settling down to working seriously on one topic rather than flitting around from one speculation to the next."

And the second problem, shared with all scientific awards, is that we do not do our science alone. In particular, I have been very fortunate to enjoy some outstanding collaborations, most notably with my own graduate students. I take great pride in their accomplishments, not least of which is their ability to continually teach me new things; including things that I have written and long since forgotten. More generally, though, we have a wonderful community in mineral physics. Except the name is wrong because we are equally interested in the structures and chemical properties of minerals. Nevertheless, as colleagues—and as friendly competitors—we have an exceptionally supportive community. And our standards are certainly high. In this regard, I would like to mention as examples two previous MSA awardees: of roughly 10 and 20 years ago. These are Dave Mao and Ted Ringwood. It seems to me that one does not come into this business unless one can hope to match their standards of excellence, their pace of research.

In short, they—all of us in mineralogy—are keeping this a lively field of research.

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