

**Presentation of the Mineralogical Society of America Dana Medal for 2004 to
R. James Kirkpatrick**

CRAIG M. BETHKE

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President Carpenter, members of the society, and guests:

It is a special honor and pleasure to introduce to you today R. James Kirkpatrick, Professor in the Department of Geology at the University of Illinois and the 2004 Dana medalist of the Mineralogical Society of America. The Dana Medal recognizes "continued outstanding scientific contributions through original research in the mineralogical sciences by an individual in the midst of his or her career." It is hard to think of a mineralogist who meets these criteria as well as Jim.

Over the course of his career, Jim has been a scientific leader in the best and broadest sense. Time after time, he has found a new approach to his research, demonstrated its utility, used it to give new and significant insights, and helped others apply it. In the 1970s, Jim set out to understand the kinetics of crystallization in magmas. At the time, thermodynamics reigned supreme and few in geoscience gave kinetic theory any serious thought. His groundbreaking work gave rise to a series of papers that defined the field, as well as the landmark 1981 "Reviews in Mineralogy" volume "Kinetics of Geochemical Processes" that he co-authored. This revolutionary book served for many of us as introduction and authoritative source of information on the

then-unknown frontier of geochemical kinetics.

In the early 1980s, only a few years after the possibility of Magic-Angle Spinning Nuclear Magnetic Resonance (MAS NMR) spectroscopy had been demonstrated for the first time, Jim, in collaboration with Eric Oldfield at the University of Illinois, mastered the technique and pioneered its application in mineralogy and geoscience. His work led to new understanding of the short-range order in the structures of alumina, silica, and aluminosilicate minerals. He went on to use NMR to define the nature of borosilicate and phosphate glasses, the structures of clays, and the sorption of ions onto mineral surfaces. More recently, he has created an intellectual bridge between geoscience and materials science. In these efforts, he has contributed fundamental understanding of the atomic structures of cements and concrete, two of the main building blocks of our modern world.

In his career, Jim has published nearly 200 carefully crafted papers. These articles make up several bodies of work that are perhaps most notable in that they remain, as much as thirty years after publication, central to the intellectual foundations of their field. Ladies and gentlemen, I present to you the 2004 Dana medalist, Jim Kirkpatrick.