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The Department of Earth and Environmental Sciences
Is proud to present
2002 Mineralogical Society of America Distinguished Lecture

The Emergence of Life: Minerals and the Rise of Complexity on the Early Earth

By

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Among the most profound unanswered questions asked by scientists and philosophers, alike, are those that relate to the origin, evolution and distribution of life in the universe. The new field of emergence – the study of complex systems that arise through the interaction of many components – provides a powerful framework for that search. Recent experiments reveal that minerals may have played critical roles in the selection and organization of biomolecules – processes that may have led to the emergence of life on Earth.

No one knows how life arose on the desolate young earth, but one thing is certain: life's origin was a chemical event. Once the earth formed 4.5 billion years ago, asteroid impacts periodically shattered and sterilized the planet's surface for another half a billion years. And yet, within a few hundred million years of that hellish age, microscopic life appeared in abundance. Sometime in the interim, the first living entity must have been crafted from air, water and rock.

Of those three raw materials, the atmosphere and oceans have long enjoyed the starring roles in origins-of-life scenarios. But rocks, and the minerals of which they are made, have been called on only as bit players or simply as props. Scientists are now realizing that such limited casting is a mistake. Indeed, a recent flurry of fascinating experiments is revealing that minerals play a crucial part in the basic chemical reactions from which life must have arisen.

Robert Hazen is Staff Scientist at the Carnegie Institution of Washington's Geophysical Laboratory and Clarence Robinson Professor of Earth Science at George Mason University. Hazen is author of more than 300 articles and 20 books, including the best-selling *Science Matters*. He is the Mineralogical Society of America's Distinguished Lecturer and has been featured on numerous radio and television shows.

Wednesday, October 9, 2002

TIME: 6 PM (Reception: 6:00 PM; Lecture: 6:20 PM)

LOCATION: McLane Hall, Room 161

(Parking restriction relaxed in Lot Q on Barstow Ave.)