Global Geochemist’s Search for Evidence of Earth’s Earliest Oxidation Wins International Recognition

Associate Professor Alan Jay Kaufman, Department of Geology and Earth System Science Interdisciplinary Center, is another UM scholar for whom the world is, quite literally, his subject. Professor Kaufman’s research looks to the far corners of the globe and deep beneath its surface for evidence of the initial rise of oxygen in the earth’s oceans and atmosphere. The international importance of his work was recently recognized through the award of a prestigious Mercator Guest Professorship by the Deutsche Forschungsgemeinschaft (DFG – the German equivalent of the NSF).

Peering into deep geological time (over 2.5 billion-years ago to be exact) by studying scientific cores drilled through similarly-aged strata from Western Australia and South Africa, Kaufman and his colleagues have recognized key changes in the geochemistry of these ancient sediments—which accumulated in shallow seas— that were clearly coupled to biological innovations. “We believe,” Kaufman said, “that these findings are a significant step in our understanding of the oxygenation of the earth, because they link changes in the environment with that of the biosphere.”

Two related papers on the earth’s early oxygenation were published back-to-back by Kaufman and his team of collaborators in the September 28 issue of Science magazine. A third related article by Kaufman and UM colleagues Associate Professor James Farquhar, graduate student David Johnston, and undergraduate research assistant Andy Masterson was published in Nature magazine on October 11. These publications were highlighted by the national and international press, including electronic articles on Yahoo, CNN, ScienceLive, Der Spiegel, and the Singapore Times, to name a few.

Professor Kaufman’s DFG fellowship has taken him to Westfälische Wilhelms-Universität in Münster for the 2007-2008 academic year. There he is continuing his paleo-environmental and paleo-climatic studies at the Geologisch-Paläontologisches Institut with his long-time friend and colleague, Harald Strauss, a co-author on the Nature paper. While in Münster, Kaufman will be far from a sedentary geologist; since arriving there he has already traveled to South Africa and Swaziland for more field research and collection of ancient rock cores.

To date, his international research has led him to Canada, Brazil, Argentina, Uruguay, Japan, South China, India, Azerbaijan and Namibia, as well as to South Africa. In 2001, Kaufman was a member of a NASA team of “astronauts to the Early Earth” sent to Western Australia to investigate sediments that harbor the most ancient signs of life on the earth, in order that we might later read similar clues in our Astrobiological search for life on other planets, like Mars. At that time the team scoped out where to start the drill core that eventually resulted in the Science papers.