

Life and the long-term stability of the biosphere



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In the traditional view, the physical environment on Earth has evolved through time; those organisms that could adapt to a changing environment survived while those that could not went extinct. The more contemporary view recognizes the global significance of life as a geologic force (to quote Peter Westbroek) and considers Earth's evolution as a tightly coupled consequence of biotic and environmental change. This talk will explore the role that life has played in the establishment and persistence of atmospheric oxygen levels sufficient to support aerobic life but insufficient to cause global conflagration. A focus will be on how considering life's unique attributes, notably the potential for exponential growth constrained by minimum, optimum, and maximum environmental conditions, changes the way in which we model the environment, both conceptually and numerically.



Lee Kump is Professor of Geosciences and John Leone Dean of the College of Earth and Mineral Sciences at Pennsylvania State University. He holds a PhD (Marine Sciences, 1986) from the University of South Florida, and is a Fellow of the AGU, EAG, and GSA, among others. His research interests are broad, covering a range of topics, timescales, and approaches within biogeochemical cycling, low temperature geochemistry, and Earth's atmosphere and ocean evolution.