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# The Origin and Nature of Life on Earth: The Emergence of the Fourth Geosphere

*By Eric Smith, Harold J. Morowitz*



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Uniting the conceptual foundations of the physical sciences and biology, this groundbreaking multidisciplinary book explores the origin of life as a planetary process. Combining geology, geochemistry, biochemistry, microbiology, evolution and statistical physics to create an inclusive picture of the living state, the authors develop the argument that the emergence of life was a necessary cascade of non-equilibrium phase transitions that opened new channels for chemical energy flow on Earth. This full colour and logically structured book introduces the main areas of significance and provides a well-ordered and accessible introduction to multiple literatures outside the confines of disciplinary specializations, as well as including an extensive bibliography to provide context and further reading. For researchers, professionals entering the field or specialists looking for a coherent overview, this text brings together diverse perspectives to form a unified picture of the origin of life and the ongoing organization of the biosphere.



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- Sales Rank: #517719 in Books
- Brand: imusti
- Published on: 2016-06-06
- Original language: English
- Number of items: 1
- Dimensions: 9.72" h x 1.38" w x 6.85" l, .0 pounds
- Binding: Hardcover
- 691 pages

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#### **Review**

"... the most significant book on the origin of life hitherto written."

Walter Fontana, Harvard Medical School

"This is a truly unusual work of scholarship, which offers both novel perspectives on a huge range of disciplines and a model of scientific synthesis. This is a remarkable, and remarkably impressive, book."

Cosma Shalizi, Carnegie Mellon University

"... an exceptionally important, highly original, unique scientific contribution ..."

Elbert Branscomb, University of Illinois

#### **About the Author**

Eric Smith is External Professor at the Santa Fe Institute, Research Professor at George Mason University and Principle Investigator at the Earth-Life Science Institute, Tokyo Institute of Technology. He is a physicist specializing in the origin of life, non-equilibrium systems, economics and the evolution of human languages.

Harold J. Morowitz is Clarence J. Robinson Professor of Biology and Natural Philosophy at George Mason University. He was founding director of the Krasnow Institute for Advanced Study at George Mason University, and is Chairman Emeritus of the Science Board at the Santa Fe Institute.

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