

## Bibliography for Ermah Ge's Earth Studies Program

Here is a list of all books (plus one web site) used in introductory and advanced courses. For intro courses in the Earth 101 series (C101, L101, G101, CM101, A101), only selected chapters are read. Advanced courses (AC) are all reading seminars in which Alder guides discussions, ensuring that participants grasp all important points, integrating ideas with other courses, promoting a holistic view. We guarantee — or your money back — that participation in our reading seminars after completion of Complexity 101 will double your understanding of these books. The true, awe-inspiring depth of Ermah Ge's program is best revealed in advanced courses. All books are written for educated lay readers. A few are used for reference (R) only.

- Bak, Per. *How Nature Works: The Science of Self-Organized Criticality* [C101, AC: an explanation of the relationship between fractals & power laws, and why the majority of change in nature & societies occurs in catastrophic avalanches]
- Buchanan Mark. *Nexus: Small Worlds & the Groundbreaking Science of Networks* [R: great primer on network theory]
- Cohen, Irun. *Tending Adam's Garden: Evolving the Cognitive Immune Self* [AC: a primer about the new model of the human immune system based in complexity that resolves a fatal flaw in contemporary models of immunology]
- Dumanoski, Dianne. *The End of the Long Summer: Why We Must Remake Civilization to Survive on Volatile Earth* [A101: the best book written on abrupt climate change and how to effectively address it; a must read]
- Ekeland, Ivar. *Mathematics and the Unexpected* [R: an exploration of 20th century mathematics that predicted rapid change during the prelude to the emergence of chaos theory]
- Gonzales, Lawrence. *Everyday Survival: Why Smart People Do Stupid Things* [A101, AC: Gonzales is an acknowledged expert in survival; second half is an excellent introduction to non-equilibrium thermodynamics]
- Harding, Stephan. *Animate Earth: Science, Intuition & Gaia* [G101, R: good primer on geophysiology, even if we have issues with some points of view expressed]
- Harold, Franklin. *The Way of the Cell: Molecules, Organisms & the Order of Life* [L101, AC: applies virtually all principles addressed in C101 to cells & organisms; probably the best biology book ever written.]
- Kellert, Stephen. *In the Wake of Chaos* [AC, R: an exploration of the origins & evolution of chaos theory, addressing both its strengths & weaknesses]
- Lovelock, James. *The Ages of Gaia: A Biography of Our Living Earth* [G101: the best primer of Gaia theory]
- Lovelock, James. *Gaia: The Practical Science of Planetary Medicine* [G101, AC, R: a thorough text on Gaia theory]
- Lovelock, James. *The Revenge of Gaia: Earth's Climate Crisis & the Fate of Humanity* [G101, AC]
- Margulis, Lynn & Dorion Sagan. *What is Life?* [L101 & AC: life explained from the perspective of complexity]
- Margulis, Lynn. *Symbiotic Planet: A New Look at Evolution* [L101, AC: an introduction to a new theory of evolution that adds symbiosis {symbiogenesis} to natural selection & genetic mutation]
- Margulis, Lynn & Dorion Sagan. *Acquiring Genomes: A Theory of the Origins of Species* [AC: a thorough treatise to symbiogenesis, evolution via symbiosis, introduced in Symbiotic Planet, but more technical]
- Margulis, Lynn & Dorion Sagan. *What is Sex?* [AC: how sex evolved via symbiosis; fascinating read]
- Margulis, Lynn & Michael Chapman. *Kingdoms and Domains: An Illustrated Guide to the Phyla of Life on Earth*, 4th edition [R]
- Margulis, Lynn & Michael Dolan. *Early Life: Evolution on Pre-Cambrian Earth* (2nd ed) [AC: short, but very dense explanation of how all of metabolism was invented by bacteria billions of years ago]
- Margulis, Lynn. *Slanted Truths: Essays on Gaia, Symbiosis & Evolution* [L101 [ch 20], R]
- Morowitz, Harold. *The Emergence of Everything: How the World Became Complex* [AC: primer on emergence theory]
- Pascale, Richard et al. *Surfing the Edge of Chaos: The Laws of Nature & the New Laws of Business* [text for business seminar]
- Peak, David & Michael Frame. *Chaos Under Control* [R: intro to chaos theory & fractal geometry for non-mathematicians]
- Pearce, Fred. *With Speed & Violence: Why Scientists Fear Tipping Points in Climate Change* [AC: a sobering book about climate change focusing on positive feedback, critical thresholds & attractor states; reads like a Stephen King novel]
- Powell, Simon G. *Darwin's Unfinished Business: The Self-Organizing Intelligence of Nature* [AC: brilliant, awe-inspiring thesis arguing that nature demonstrates intelligence, albeit *not* consciousness; *greatly* extends our understanding of nature & evolution.]
- Sagan, Carl. *The Demon-Haunted World: Science as a Candle in the Dark* [R: why science & critical thinking are crucially important to any enlightened society, lest superstition will come to dominate]
- Sagan, Dorion & Eric Schneider. *Into the Cool: Thermodynamics, Energy Flow & Life* [C101, AC: the best primer on non-equilibrium thermodynamics leading to a radical new understanding of life at all levels, from cells to the planet]
- Sole, Ricard & Brian Goodwin. *Signs of Life: How Complexity Pervades Biology* [C101, AC: application of nearly many principles addressed in C101 to metabolism, genetics, physiology, brains, social insects, ecology & evolution]
- Turner, Jack. *The Abstract Wild* [AC: exploration of the concept of "wildness" from a perspective of complexity sciences]
- Weart, Spencer. *The Discovery of Global Warming* [CM101, AC: a web site; the most thorough treatment the current state of Earth's climate, its history, and the history of climatology, including mistakes made early on that led to confusion]