About 13.7: Cosmos And Culture

December 16, 2009

Welcome to *13.7*, an opinion blog set at the inersection of science and culture.

The contributors to this blog are convinced that scientists must engage in the public debate of what science can and cannot do.

Science and its imperatives are deeply embedded in all aspects of human endeavor and human history. Science has shaped culture and, just as importantly, culture has shaped science.

This blog is a platform in which science and the domains of human culture, spirituality and imaginative capacity can speak to each other, addressing the extraordinary and pressing issues we face in this new century.

(P.S. In case you haven't guessed, clicked or Googled yet, the name refers to the estimated age of the universe -- 13.7 billion years.)

The contributors are:

K.C. Cole, a long-time science writer for the *Los Angeles Times*, is a professor at USC Annenberg's School of Journalism. Cole's writing has appeared in *The New Yorker*, *The New York Times*, *The Smithsonian*, *The Columbia Journalism Review*, *Newsweek*, *Esquire*, *Ms.*, *The Washington Post* and many other publications; her work was featured in *The Best American Science Writing 2004* and *2005*, and *The Best American Science and Nature Writing 2002*.

Cole has won numerous awards, including the American Institute of Physics prize for science writing, the *Los Angeles Times* award for Explanatory Journalism, the Edward R. Murrow Award for "thoughtful coverage of scientific controversies" from the Skeptics

Society and the Exploratorium's public understanding of science award.

She is the author of eight nonfiction books, most recently, *Something Incredibly Wonderful Happens: Frank Oppenheimer and the World He Made Up*, a memoir/biography of her late mentor, the self-proclaimed "uncle" of the atomic bomb and founder of San Francisco's world-renowned "museum of awareness," the Exploratorium. Her other books include *The Universe and the Teacup: The Mathematics of Truth and Beauty*, *Mind Over Matter: Conversations with the Cosmos*, *The Hole in the Universe* and *First You Build a Cloud*.

Cole has also been a frequent commentator on the radio, appearing on American Public Media's *Marketplace*, KPCC (Southern California Public Radio), NPR's *Science Friday* and the BBC World Service.

Cole likes to play with the natural connections between science, art, politics, whatnot, and hosts an irregular series of events exploring these intersections at Santa Monica Art Studios known as "Categorically Not!"

Read K.C. Cole's first post for *13.7*:
Noticings: The Art And Science Of Social Invention

Adam Frank fell in love with astronomy when he was 5 years old and the affair has never cooled.

Late one night in the family library, the future Professor Frank found the keys to the Universe sketched out on the covers of his dad's pulp-science-fiction magazines. From astronauts bounding across the jagged frontiers of alien worlds to starships rising to discovery on pillars of fire, the boundless world of possibilities on those covers became the one he was determined to inhabit.

Later the love for astronomy transformed into a passion for the practice of science itself when his father's simple explanation of

electric currents and sound waves turned the terror of a booming thunderstorm into a opportunity to marvel at the world's beauty.

Now a professor of astrophysics at the University of Rochester, Adam Frank studies the processes which shape the formation and death of stars and has become a leading expert on the final stages of evolution for stars like the sun.

Frank is a theoretical/computational astrophysicist and currently heads a successful research group. He holds a joint appointment at the Laboratory for Laser Energetics, a Department of Energy Fusion lab. As a post-doc he was awarded the prestigious Hubble Fellowship and in 1997 he was awarded an NSF Career award.

Frank described himself as an "evangelist of science." His commitment to showing others the beauty and power of science has led him to a second career as a popular writer and speaker on the subject. For the last 16 years Frank has published numerous popular articles on everything from planet formation to the quantum mechanics of honey bee dances (a piece that inspired a major art installation).

He has been a regular contributor to *Discover Magazine* and *Astronomy Magazine* (where he serves on the editorial advisory board) and has written for *Scientific American*, *Sky & Telescope*, *Tricycle* and many other publications. In 1999 Frank was awarded an American Astronomical Society prize for his science writing.

In January 2009 his first book, *The Constant Fire*, was published by the University of California Press. This year his work will appear in *The Best American Science and Nature Writing 2009*. *The Constant Fire* was chosen one of *SEED* magazine's "Best Picks of the Year."

Read Adam Frank's first post for *13.7*:
Crossroads Real And Imagined: Why I'm Here.

Marcelo Gleiser is the Appleton Professor of Natural Philosophy and a professor of physics and astronomy at Dartmouth College. He has authored over 80 refereed articles, is a Fellow of the American Physical Society and a recipient of the Presidential Faculty Fellows Award from the White House and the National Science Foundation.

Marcelo is the author of the books *The Dancing Universe*, *The Prophet and the Astronomer* and the forthcoming *A Tear at the Edge of Creation* (Free Press, April 2010). He is a frequent presence in TV documentaries and writes often for magazines, blogs, and newspapers on various aspects of science and culture.

Read Marcelo Gleiser's first post for *13.7*:
Science For A New Millennium

Ursula Goodenough is a professor of biology at Washington University, where she teaches cell biology and molecular evolution. Goodenough also heads a lab that studies 1) the molecular basis for sexual life-cycle transitions in a green soil alga and 2) the production of triglycerides as a potential source of algal biodiesel.

She was trained at Harvard and Columbia. She has served as president of the American Society of Cell Biology and is a fellow of the American Academy of Arts and Sciences.

Goodenough's avocation is an exploration of the religious potential of our scientific understandings of nature, generating a book, *The Sacred Depths of Nature* (Oxford), and long-term participation in the Institute on Religion in an Age of Science.

Stuart Kauffman is an experimental and theoretical biologist.

Kauffman has written about three hundred articles and four books: *The Origins of Order* (1993), *At Home in the Universe* (1995) and

Investigations (2000), published by Oxford University Press. Most recently he published *Reinventing the Sacred* (2008), Basic Books.

Kauffman is well known for arguing, in *Origins of Order* and *At Home in the Universe*, that self organization, as well as Darwin's natural selection, are twin sources of order in biology. Thus we must rethink the becoming of the biosphere.

Investigations and *Reinventing the Sacred* argue, radically, that the becoming of the universe, biopshere, economy, and culture cannot be sufficiently described by natural laws, but are creative and open, that we not only do not know what will happen, but do not even know what can happen. Thus, reason is an insufficient guide to living our lives forward and we must reunite our entire humanity, find a sharable sense of the sacred, and a global ethic to undergird the generative coevolution of our 30 or more civilizations.

Kauffman holds bachelor's degrees from Dartmouth and Oxford. He earned his M.D. at the University of California Medical School. He has held faculty positions at the University of Chicago, National Institutes of Health, University of Pennsylvania, the Santa Fe Institute, and, most recently, was the Founding Director of the Institute for Biocomplexity and Informatics at the University of Calgary.

He was awarded a MacArthur Fellowship in 1987, is a Fellow of the Royal Society of Canada, was awarded the Gold Medal of the Acadamia di Lincea of Rome and holds an honorary doctorate from the Universite catholique de Louvain in Belgium.

Kauffman now splits his time between an appointment with the Finland Distinguished Professor Programme (FiDiPro) at Tempere University and another appointment with The University of Vermont's Complex Systems Center.

His current experimental work involves inducing cancer cells to differentiate into normal, non-proliferating cells to achieve cancer differentiation therapy.

Kauffman has also founded three companies, Darwin Molecular, GenPathway, both biotechnology companies, and BiosGroup, founded with Ernst & Young, to apply complexity models to business.

Read Stuart Kauffman's first post for *13.7*:
Entering A New Time For Our Co-Evolving Civilizations