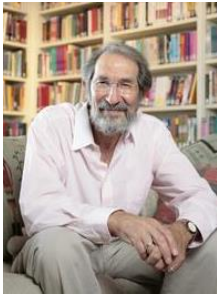


GEOFFREY WEST
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Geoffrey West is Distinguished Professor and former President of the Santa Fe Institute. Previously, he was leader of high energy physics at Los Alamos National Laboratory, where he remains Senior Fellow. He received his BA from Cambridge University (1961) and PhD in physics from Stanford University (1966) where he returned in 1970 to join the faculty. West is a theoretical physicist with primary interests in fundamental questions in physics and biology, ranging from elementary particles and their cosmological implications to universal scaling laws and a unifying quantitative framework of biology. His biology research includes metabolic rate, growth, aging, mortality, sleep, cancer, and ecosystems. Recent work focuses on a quantitative theory of cities, companies and sustainability, including growth, innovation, the pace of life, why companies die, yet cities survive. Recent awards include the Mercer Prize (Ecological Society of America), the Weldon Prize for Mathematical Biology, the Glenn Award for Aging research, selection as a breakthrough idea of 2007 by Harvard Business Review, and for Time magazine's 2006 list of "100 Most Influential People in the World".

Abstract

Complexity and Transdisciplinarity; Science for the 21st Century (?)

Many of the most challenging, exciting and profound questions facing science and society fall under the banner of "complex adaptive systems" and typically transcend traditional disciplinary boundaries. We need to develop quantitative, predictive, conceptual frameworks for addressing multiply interconnected problems where emergent behaviour, multiscale phenomena and the threat of unintended consequences prevail; examples include global warming, the environment, urbanisation, sustainability, risk and financial markets, health and disease, conflicts and patterns of political violence. Institutions are needed where creative, trans-disciplinary collaborations are strongly encouraged and supported to develop systemic, integrated methodologies and paradigms for understanding concepts like innovation, growth, adaptability, robustness and the integration of information and energy, whether for organisms, ecosystems, financial markets, computer networks or societies. These ideas and challenges will be exemplified using the experience of The Santa Fe Institute including some of my own research.