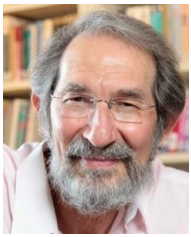
GEOFFREY WEST

Former president and distinguished professor of the Santa Fe Institute, United States



Geoffrey West is Distinguished Professor and former President of the Santa Fe Institute. He is an Associate Fellow of Oxford University's Martin School and a Visiting Professor at Nanyang Technical University, Singapore. His BA is from Cambridge and PhD from Stanford where he later returned to join the faculty. West is a theoretical physicist whose primary interests have been in fundamental questions ranging from the elementary particles and their cosmological implications to universal scaling laws in biology and a quantitative predictive science of cities, companies and global sustainability. His work is motivated by the search for unifying principles and the "simplicity underlying complexity". His research includes metabolism, growth, aging & lifespan, sleep, cancer and ecosystems, the dynamics of cities and companies, rates of growth and innovation, and the accelerating pace of life.

West has given many academic seminars world-wide as well as many lectures at high profile events including Davos and TED. Among his awards are the Mercer Prize from the Ecological Society of America, the Weldon Prize for Mathematical Biology, the Glenn Award for Aging research and the Szilard Award from the American Physical Society. He has been featured in many publications world-wide including The New York Times, Financial Times, Wired, Time, The Economist and Scientific American and participated in television productions including Nova, National Geographic and the BBC. He recently published the best-selling book Scale. His public service includes serving on the Council of the World Economic Forum. His work was selected as a breakthrough idea by the Harvard Business Review in 2006 and he was on Time magazine's list of "100 Most Influential People in the World" in 2007.

The emergence of a universal time in living systems from cells to cities

Why do we stop growing, live for 100 years and sleep for 8 hours a day? Why do all companies and people die whereas cities keep growing and the pace of life continues to accelerate? Where do such time scales and rates come from and how are they related, if at all, to innovation, adaptation, wealth creation and the long-term sustainability of the planet? These are among the questions that will be addressed in this lecture. Although life is probably the most complex and diverse phenomenon in the Universe, many of its characteristics scale with size in a surprisingly simple fashion: for example, metabolic rate scales in a systematically predictive way from cells to whales, while time-scales, from lifespans to growth-rates, and sizes, from genome lengths to tree heights, likewise scale systematically. Remarkably, cities and companies also exhibit systematic scaling: wages, profits, patents, crime, disease, and roads all scale in an approximately "universal" fashion. The origin of these laws, which constrain much of the organisation and dynamics of life, will be explained and related to the underlying dynamics and geometry of the networks that sustain life ranging from circulatory systems of mammals, tumors and forests to social and transport networks of cities. This framework leads not only to the scaling laws but to emergent "universal" time scales common to all organisms and cities that transcend their history, geography and culture.