



THE
HUMBLE
APPROACH
INITIATIVE

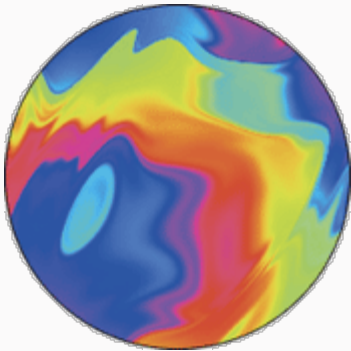
March 27, 28, 29, 2003

Stanford University, Palo Alto, California



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A "KANDINSKY" UNIVERSE



"Beginning of simulations"



"Late stages of simulations"

Fractallike nature of the inflationary universe along the lines of a different theory of particle physics. Strange color pattern corresponds to the distribution of energy in the theory of axions—known as a Kandinsky universe.

—Andrei Linde

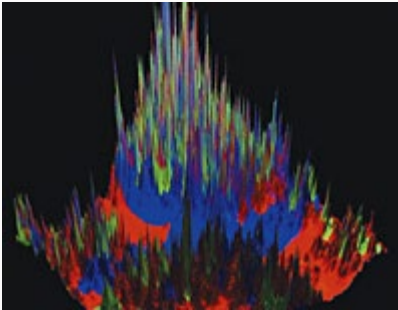
"The Self-Reproducing Inflationary Universe"

The concept of a multiplicity of possible or actual universes is a very ancient one. In recent years, however, advances in physics and cosmology have given the "multiverse" idea a plausible scientific basis. Its new lease on life can be traced to the theory of inflation, which in its original form, suggested by Alan Guth, held that a split second after the Big Bang the universe abruptly jumped in size by a huge factor. Most theorists agreed that inflation could explain many puzzles about the structure and evolution of the universe. In the variant introduced by Andrei Linde, inflation spawns a network of branching "bubble" universes with different laws of physics operating inside of them. It has become fashionable to invoke some species of the multiverse theory to account for the well-known examples of parameter fine-tuning associated with the emergence of life in the observable universe where Earth has its home. But the possibility of many universes raises deep scientific, philosophical, and theological questions. How does the multiverse modify our understanding of the ultimate origin of the physical universe in time? Does the cosmos reproduce forever? Can the multiverse theory be made consistent with Occam's razor? Is the theory falsifiable? If it is, how? If our universe, subtle, beautiful, and intelligible as it appears, is just, in Martin Rees's phrase, "one island in the cosmic archipelago," can it really be so special after all? To examine the conjectures that are so dramatically enlarging our cosmic perspective, fourteen scientists and philosophers gather in Palo Alto, California under the aegis of the John Templeton Foundation. Their conversation takes place on the campus of Stanford University, home of one of the world's leading research laboratories, the Stanford Linear Accelerator Center, and to a highly-regarded physics department with dynamic astrophysics and particle-theory groups.



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SELF-REPRODUCING UNIVERSE



in a computer simulation consists of exponentially large domains, each of which has different laws of physics (represented by colors). Sharp peaks are new "big bangs"; their heights correspond to the energy density of the universe there. At the top of the peaks, the colors rapidly fluctuate, indicating that the laws of physics there are not yet settled. They become fixed only in the valleys, one of which corresponds to the kind of universe we live in now.

—Andrei Linde
"The Self-Reproducing Inflationary Universe"

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The symposium is part of the Templeton Foundation's *Humble Approach Initiative*. The goal of the initiative is to bring about the discovery of new spiritual information by furthering high-quality scientific research. The "humble approach" is inherently interdisciplinary, sensitive to nuance, and biased in favor of building linkages and connections. It assumes an openness to new ideas and a willingness to experiment. Placing high value upon patience and perseverance, it retains a sense of wondering expectation because it recognizes, in Loren Eiseley's haunting phrase, "a constant emergent novelty in nature that does not lie totally behind us, or we would not be where we are." A fundamental principle of the Foundation, in the words of its founder, is that "humility is a gateway to greater understanding and open[s] the doors to progress" in all endeavors. Sir John Templeton believes that in their quest to comprehend ultimate reality, scientists, philosophers, and theologians have much to learn about and from one another. The humble approach is intended as a corrective to parochialism. It encourages discovery and seeks to accelerate its pace.

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Thomas Wright's 1750 book, *An Original Theory of the Universe*, contained this illustration of the author's "endless immensity" of galaxies.

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Paul Davies is the professor of natural philosophy in the Australian Centre for Astrobiology at Macquarie University. After earning a Ph.D. in physics at University College, London in 1970, he held academic appointments in astronomy, physics, and mathematics at the universities of Cambridge, London, Newcastle upon Tyne, and Adelaide. His research has spanned the fields of cosmology, gravitation, and quantum field theory, with particular emphasis on black holes and the origin of the universe. Dr. Davies is also widely known as an author. He has written more than twenty-five books, both popular and specialist works, including *The Physics of Time Asymmetry*, *Quantum Fields in Curved Space* (co-authored with Nicholas Birrell), *The Mind of God*, *About Time*, *How to Build a Time Machine*, and, most recently, *The Origin of Life*, which was published by Penguin in January. He also has extensive experience in television and radio, including the presentation of two Australian television series entitled *The Big Questions*. His work in astrobiology was the subject of a BBC television documentary, "The Cradle of Life," earlier this year. He has won numerous awards for his scientific and media work, including the 1995 Templeton Prize. He received the 2001 Kelvin Medal presented by the UK Institute of Physics and the 2002 Michael Faraday Prize of the Royal Society for his contributions to promoting science to the public. Three years ago, the asteroid 1992 OG was officially named (6870) "Pauldavies" in his honor.

