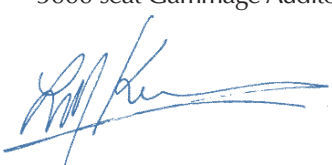
We are proud to celebrate the new Origins Initiative—a university-wide, transdisciplinary endeavor that supports research, education, and outreach associated with mysteries at the forefront of knowledge. It will focus on deep and foundational questions ranging across the entire spectrum of scholarship, from evolutionary biology to nanotechnology, from anthropology to cosmology, exploring the origin of the universe, stars planets, life, consciousness, culture and human institutions.

ASU currently houses a unique set of interdisciplinary centers of research excellence. The Origins Initiative will provide a unifying umbrella to foster and extend the work of these groups and explore new, symbiotic interdisciplinary relationships that can help answer key research questions. By combining extensive disciplinary expertise with the opportunity to bring in outside scholars for extended programs, host seminars and workshops on selected topics, foster graduate and postgraduate research, create new curricula and engage in significant outreach programs , the Institute will work to develop new solutions to outstanding problems, and will also help direct a national and international discussion of important origins issues.

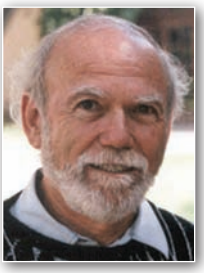
The Origins Initiative is being inaugurated in 2009 with the Origins Symposium. This unprecedented event will bring together 70 of the world's leading scientists and scholars, including 8 Nobel Laureates, and the world's pre-eminent scientific public intellectuals, for three days of panels directed at exploring important outstanding research questions, and will be capped by several remarkable associate activities, including a full day of public lectures and panels at the 3000 seat Gammage Auditorium on ASU's Tempe campus.



LAWRENCE M. KRAUSS
Director, Origins Initiative

ASU
ARIZONA STATE UNIVERSITY

Ariel D. Anbar is an Associate Professor in the School of Earth & Space Exploration and the Department of Chemistry & Biochemistry at Arizona State University. His research centers on the evolution of the Earth as a habitable world, using the tools of isotope biogeochemistry to unravel the history of environmental oxygenation and the availability of bioessential elements in the oceans. He leads the NASA Astrobiology Institute team at ASU.



Barry C. Barish pioneered high energy neutrino physics at Fermilab in experiments that revealed the quark substructure of the nucleon and provided definitive evidence for the weak neutral current. He built a large underground detector, MACRO, that set stringent limits on monopole abundance and provided key evidence that neutrinos have mass. At present, he is searching for gravitational waves with LIGO, and designing a future linear collider.

Roger Bingham is Co-founder and Director of The Science Network. He is also a member of the Computational Neurobiology Laboratory at the Salk Institute for Biological Studies and the Institute for Neural Computation at UC San Diego. He is the co-author of *The Origin of Minds: Evolution, Uniqueness,* and the *New Science of the Self,* and the creator and host of Emmy Award-winning PBS science programs on evolutionary psychology and cognitive neuroscience, including the critically acclaimed series *The Human Quest.*

Roger Blandford is Pehong and Adele Chen Director of the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC), Professor at the Stanford Linear Accelerator Center (SLAC) and Luke Blossom Professor in the School of Humanities at Stanford University. He is also a Fellow of the Royal Society and Fellow of the American Academy of Arts and Sciences. His research interests include cosmology, black hole astrophysics, gravitational lensing, galaxies, cosmic rays, neutron stars and white dwarfs.

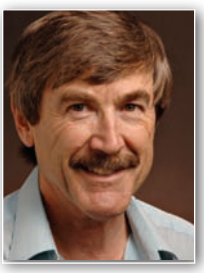
Baruch Blumberg is a Distinguished Scientist at Fox Chase Cancer Center, Philadelphia, Pennsylvania and University Professor of Medicine and Anthropology at the University of Pennsylvania in Philadelphia. His research has covered many areas including clinical research, epidemiology, virology, genetics, and anthropology. He was awarded the Nobel Prize in 1976 for "discoveries concerning new mechanisms for the origin and dissemination of infectious diseases" and, specifically, for the discovery of the Hepatitis B virus.

Jade Bond is a Research Associate at Steward Observatory at the University of Arizona. Focusing on the chemical composition of extrasolar terrestrial planets, her research is some of the first to consider the planetary effects of the variations in elemental abundances observed in known planetary host stars.

Rob Boyd has taught at Duke and Emory universities and has been at UCLA since 1986. His research focuses on population dynamic models of culture and is summarized in two books, co-authored with P. J. Richerson, *Culture and the Evolutionary Process*, and *Not By Genes Alone*. Rob has also co-authored an introductory textbook in biological anthropology, *How Humans Evolved*, with his wife, Joan Silk.

Philip Christensen is a Regents Professor in the School of Earth and Space Exploration at Arizona State University. His research focuses on the composition, processes, and geologic evolution of Mars, the Earth, and other planetary surfaces. A major element of his research is the development of infrared spectrometers and imagers, and he has built science instruments that have flown on five NASA missions to Mars.

Patricia Smith Churchland, UC President's Professor of Philosophy, UC San Diego, focuses on neuroethics and attempts to understand choice, responsibility and the basis of moral norms in terms of brain function, evolution and brain-culture interactions. Her books include *Brain-Wise, Neurophilosophy: Toward a Unified Science of the Mind-Brain* and *On the Contrary*, with Paul M. Churchland.



Paul Davies, Director of BEYOND, is a theoretical physicist, cosmologist, astrobiologist and best-selling author. His research ranges from the origin of the universe to the origin of life, and includes the properties of black holes, the nature of time and quantum field theory. He is the recipient of numerous awards, including the 1995 Templeton Prize, and the 2002 Michael Faraday Prize from the Royal Society.

Richard Dawkins, FRS and first Charles Simonyi Professor of the Public Understanding of Science at the University of Oxford, is the author of nine books, including *The Selfish Gene, The Extended Phenotype, The Blind Watchmaker, River Out of Eden, Climbing Mount Improbable, Unweaving the Rainbow, The Ancestor's Tale* and *The God Delusion*. His next book, *The Greatest Show on Earth: The Evidence for Evolution,* is to be published in Fall 2009.

Steve Desch is an astrophysicist in Arizona State University's School of Earth and Space Exploration. His research spans a range of topics to do with formation of solar systems and planets, from the Sun's star formation environment, the structure and evolution of the solar nebula, to the evolution of icy dwarf planets. He specializes in applying meteoritic data to astrophysical models, for which he was awarded the 2003 Nier Prize of the Meteoritical Society.

Hugh Downs is one of the most recognized figures in American television. He co-anchored ABC News *20/20* for over twenty years. He has received a number of awards, including a Guinness Record for the most hours on network television and multiple Emmy Awards. He has hosted and co-hosted *The Tonight Show, The Today Show, Not for Women Only* – as well as other television programs and specials – and has appeared in several films, authored nine books and is a published composer.

Claudia Dreifus is a bestselling author and interviewer, as well as a Senior Fellow at the World Policy Institute of the New School for Social Research. She contributes to the Science Section of *The New York Times* and is the author of *Scientific Conversations: Interviews on Science from The New York Times.* She has reported from locations all around the world, including Nicaragua, Chile, Pakistan and Burma for a variety of newspapers and magazines.

Ann Druyan is the CEO and Co-founder of Cosmos Studios. With her late husband, Carl Sagan, she co-authored several books as well as the award winning television series *COSMOS.* She has contributed to *The New York Times Sunday Magazine, Reader's Digest, Parade, The Saturday Evening Post* and other magazines and newspapers. She also directs the New York Children's Health Fund, and is on the Board of Directors for the National Organization for the Reform of Marijuana Laws.

Doug Erwin is Senior Scientist and Curator at the Smithsonian Institution's National Museum of Natural History, and a Professor at the Santa Fe Institute. A paleobiologist and evolutionary biologist, his current research involves ecological and developmental aspects of evolutionary innovations, particularly during the Cambrian. His most recent book is *Extinction: How Life on Earth Nearly Ended 250 Million Years Ago.*

John Fleagle is Distinguished Professor of Anatomical Sciences at Stony Brook University. He has conducted paleontological research on primate and human evolution in many parts of the world, including Egypt, Ethiopia, Kenya, Argentina, and India. He is the Editor of *Evolutionary Anthropology* and author or editor of numerous books including *Primate Adaptation and Evolution, The Human Evolution Sourcebook* (with R.L. Ciochon) and *Primate Biogeography* (with S.L. Lehman).

Wendy Freedman is the director of Carnegie Observatories. Her interests include: observational cosmology, galactic evolution, and the evolution of stellar populations. As a principal investigator involved in the Hubble Space Telescope Key Project, she led an effort to determine the rate at which the universe is expanding. The results, published in *Astrophysics Journal*, agree with other results that have found the age of the universe to be 13.7 billion years.

Carlos Frenk is the Ogden Professor of Fundamental Physics and Director of the Institute for Computational Cosmology at Durham University. He is one of the originators of the "Cold dark matter" theory for the formation of galaxies and other cosmic structures. He specializes in large supercomputer simulations of the Universe. He is one of the top ten most cited authors in the world in the scientific literature on Space Sciences and Astronomy.

Jürgen Gadau is an Associate Professor at Arizona State University. His major research interests include the genetic basis of speciation and adaptation, symbiosis and coevolution, and sociogenetics. He classifies himself as an evolutionary geneticist/ behavioral ecologist, who tries to understand the evolution of novel traits on multiple organizational levels, from genes to societies. He recently edited *On the organization of insect societies – From Genome to Sociocomplexity* for Harvard University Press.

Walter Gilbert worked on the mechanism of protein synthesis, isolated lac repressor, expressed proinsulin in bacteria, and argued that genes were created through the process of exon shuffling. He co-founded Biogen, Myriad Genetics, and Paratek Pharmaceuticals. Now a venture capitalist, he received a 1980 Nobel Prize in Chemistry for rapid DNA sequencing and the 1991 Institute of American Entrepreneurs "Entrepreneur of the Year" award. He is currently a photographic artist.

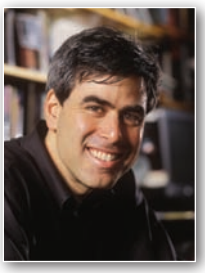
Sheldon L. Glashow is the Arthur G.B. Metcalf Professor of the Sciences at Boston University. In 1979, he shared a Nobel Prize in Physics for his contributions toward the unified theory of weak and electro-magnetic forces. He is a member of the National Academy of Science, the American Academy of Arts and Sciences, the American Philosophical Society, and a foreign member of the National Academies of Russia, Korea and Costa Rica. Glashow has published three books and over 300 technical and popular articles.

A. C. Grayling is Professor of Philosophy at Birkbeck College, University of London, and a Supernumerary Fellow of St. Anne's College, Oxford. He has written and edited many books on philosophy and other subjects. Among his most recent are books on applied ethics, scepticism, and an informal dictionary of ideas. He is the Editor of *Online Review London*, and Contributing Editor of *Prospect* magazine.

Brian Greene is one of the world's leading theoretical physicists and a brilliant, entertaining communicator of cutting-edge scientific concepts. Greene is a professor in both Physics and Mathematics at Columbia University. He is author of *The Elegant Universe, The Fabric of the Cosmos*, and *Icarus at the Edge of Time. The Washington Post* described him as "the single best explainer of abstruse concepts in the world today."

David Gross has been the director of the Institute of Theoretical Physics at the UC Santa Barbara since 1997. In 2002, he was named the Frederick W. Gluck Chair in Theoretical Physics, an endowed chair for the director of the Kavli Institute for Theoretical Physics. In 2004, he, Frank Wilczek, and David Politzer were given the Nobel Prize in Physics "for the discovery of asymptotic freedom in the theory of the strong interaction."

Alan Guth is the Victor F. Weisskopf Professor of Physics and a Margaret MacVicar Faculty Fellow at the Massachusetts Institute of Technology. Trained in particle theory at MIT, Guth held postdoctoral positions at Princeton, Columbia, Cornell, and Stanford Linear Accelerator Center before returning to MIT as a faculty member in 1980. He is best known for his 1981 paper, which explained how a short period of cosmic inflation could answer a number of riddles about the universe.

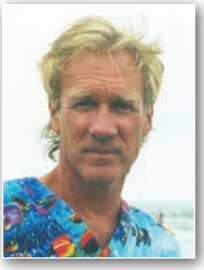


Jonathan Haidt is an Associate Professor of Psychology at the University of Virginia. He studies the emotional and intuitive foundations of morality, politics, and religion. His current work is based on the idea that morality is a team sport and that political liberals have more difficulty understanding this than do political conservatives. He is the author of *The Happiness Hypothesis*, and is currently writing *The Righteous Mind: Why Good People are Divided by Politics and Religion*.

Alex Halliday is an isotope geochemist who has broadened his interests from the Earth's interior to the origin and early history of the terrestrial planets and large-scale surface processes such as erosion and ocean circulation. An underlying theme has been the development and use of new mass spectrometry and associated methods. He is Head of the Mathematical, Physical and Life Sciences Division of Oxford University.

Lucy Hawking is a journalist and novelist, as well as a regular radio contributor. She has written two novels, as well as several children's books co-authored with her father, theoretical physicist Stephen Hawking. She is a member of the Royal Society of Arts in London and recently won the Sapio Prize for Popularizing Science. She is the Vice President of National Star College and an administrative staff member of the Autism Research Center at the University of Cambridge.

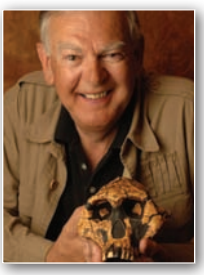
Stephen Hawking is Lucasian Professor of Mathematics at Cambridge and is widely considered to be one of the greatest theoretical physicists since Newton and Einstein. He is the author of many books and a prolific contributor to all areas of gravitational physics, in particular the origin and evolution of the universe. His popular best-seller is *A Brief History of Time*. In 2006, he was awarded the Copley Medal of the Royal Society of London.



Kim Hill is a Full Professor in the School of Human Evolution and Social Change at Arizona State University. He studied evolutionary biology and molecular genetics before shifting to anthropology. His research on the behavioral ecology of hunter-gatherers led to field studies in the Amazon basin stretching more than 30 years. He has published more than 150 papers on foraging patterns, food sharing, life history evolution, and most recently on the emergence of social learning (culture) and exceptional levels of cooperation between non-kin in humans.

Kip Hodges is a geologist and Founding Director of the School of Earth and Space Exploration at Arizona State University. His field research includes work in the Arctic, western North America, the Peruvian Andes, and the Himalayan–Tibetan system. He has helped develop new analytical techniques in low-temperature isotope geochronology.

Bert Hölldobler is Foundation Professor of Life Sciences at Arizona State University. He is a member of the new Center for Social Dynamics and Complexity and plays a key role in organizing the new social insect research group at the School of Life Sciences. He is the author of several books. He received the Pulitzer Prize For his book, *The Ants,* which he co-authored with E.O. Wilson.
.



Donald C. Johanson is the Founding Director of the Institute of Human Origins at Arizona State University. For the past 30 years he has conducted field and laboratory research in paleoanthropology. Most notably, he discovered the 3.18 million year old hominid skeleton popularly known as "Lucy." He has written, among other books, the widely read *Lucy: The Beginnings of Humankind* (with Maitland Edey), and numerous scientific and popular articles.

William Kimbel is Director in the Institute of Human Origins at Arizona State University. He conducts field, laboratory and theoretical research in paleoanthropology, with a primary focus on Plio-Pleistocene hominid evolution in Africa. He has undertaken field and/or laboratory research in Ethiopia (Hadar) and Tanzania (Olduvai Gorge), as well as in Kenya, South Africa and Tunisia. He also has collaborated with Israeli colleagues in excavations in the Middle Paleolithic Neanderthal-bearing cave of Amud.

Lawrence M. Krauss is Foundation Professor in the School of Earth and Space Exploration and Physics Departments and Beyond Center, and Director of the Origins Initiative at Arizona State University. An international leader in cosmology and astrophysics, he is the author of over 250 scientific papers and seven books, including *The Physics of Star Trek*, and has been awarded the highest awards of the American Physical Society, the American Association of Physics Teachers, and the American Institute of Physics.

Robert Kurzban is an Associate Professor at the University of Pennsylvania in the Department of Psychology. In 2003, he founded the Penn Laboratory for Experimental Evolutionary Psychology. Research in the lab is focused primarily, but not exclusively, on the array of specialized cognitive mechanisms designed to navigate a complex social world. In 2008, he won the inaugural Distinguished Scientific Award for Early Career Contribution from the Human Behavior and Evolution Society.

Manfred D. Laubichler is Professor of Theoretical Biology and History of Biology in the School of Life Sciences and the Centers for Biology and Society and Social Dynamics and Complexity at Arizona State University. He is associate editor of the *Journal of Experimental Zoology: Molecular and Developmental Evolution* and of *Biological Theory.* He is co-editor of *From Embryology to Evo Devo, Modeling Biology,* and *Form and Function in Developmental Evolution.*

Antonio Lazcano, a professor at the Universidad Nacional Autónoma de México (UNAM) in Mexico City, has studied the origin and early evolution of life for over 30 years. He has published over 135 papers in international journals and books on prebiotic hemistry and early biological evolution. An academic deeply committed to public education, he has also devoted considerable efforts to scientific journalism and teaching.

Margaret Levi is Jere L. Bacharach Professor of International Studies, Department of Political Science, University of Washington, and Professor of Politics, US Studies Centre, University of Sydney. She is past President of the American Political Science Association and the General Editor of both the *Annual Review of Political Science* and Cambridge University Press's book series *Studies in Comparative Politics.*

Andrei Linde is a Professor of Physics at Stanford University. He is one of the authors of inflationary cosmology, of the theory of eternal inflation, and of the inflationary multiverse scenario. The theory of an inflationary multiverse resolved many problems of the previous versions of the big bang cosmology and provided a scientific foundation to the cosmological anthropic principle and the string landscape scenario.

Michael Macy is Goldwin Smith Professor of Sociology and Director of the Social Dynamics Laboratory at Cornell. With support from the National Science Foundation, his research team uses agent-based computational models, on-line laboratory experiments, and the digital traces of on-line social interaction to study the emergence and diffusion of social norms in dynamic networks. He is currently developing tools to explore the 40-billion-page Internet Archive.

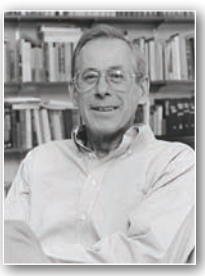
Curtis W. Marean is a Professor of Anthropology at Arizona State University and Associate Director of the Institute of Human Origins. His research interests include the origins of modern humans, the prehistory of Africa, and the study of animal bones from archaeological sites. He has conducted research in Ethiopia, Kenya, Tanzania, and Somalia, and has been conducting field research on the Middle Stone Age in South Africa since 1991.

John C. Mather is a Senior Astrophysicist in the Observational Cosmology Laboratory at NASA's Goddard Space Flight Center. He came to Goddard to be the Principal Investigator for the Far IR Absolute Spectrophotometer (FIRAS) on the Cosmic Background Explorer (COBE). His research centers on infrared astronomy and cosmology. He is a recipient of the Nobel Prize in Physics (2006) with George Smoot, for the COBE work.

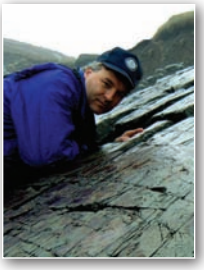
Stephen Mojzsis is Associate Professor of Geology at the University of Colorado in Boulder. He received his Ph.D. at the Scripps Institution of Oceanography, and performed postdoctoral studies at the W.M. Keck Center for Isotope Geochemistry before joining the Colorado faculty in 2001. His current research explores the timing and nature of life's emergence and the chemical composition of carbonaceous matter.

Ben Moore is Director of the Institute for Theoretical Physics at the University of Zurich. His research interests include large-scale structure of the universe, galaxy formation, the nature of dark matter, and the origin and stability of the Earth and Solar System. He established the Astrophysics research activity in Zurich in 2002, during which time he designed and built the "zbox", the fastest supercomputer in Switzerland.

Randolph M. Nesse is Professor of Psychiatry and Professor of Psychology at the University of Michigan, where he directs the Evolution and Human Adaptation Program. He collaborated with the George Williams to write several seminal works on Darwinian medicine. His current research foci are on how selection shapes mechanisms that regulate defenses such as pain, anxiety and low mood, and the evolutionary origins of human sociality and the moral passions.



Jim Peebles is the Albert Einstein Professor of Science Emeritus at Princeton University. Peebles made many important contributions to the big bang model. In 1987, he proposed the primordial isocurvature baryon model for the development of the early universe. With Robert Dicke and others, he predicted the cosmic microwave background radiation. He has authored numerous scientific articles and holds memberships with various science associations. Asteroid 18242 bears his name.



Kevin J. Peterson is an Associate Professor of Biology at Dartmouth College. He is a 1989 graduate of Carroll College (Maxima cum Laude, Helena MT), and a 1996 graduate of UCLA. (Ph.D., Paleobiology). He uses a molecular paleobiological approach to address the origin and early evolution of animals, specifically the Cambrian explosion.

Steven Pinker is Harvard College Professor and Johnstone Family Professor in the Department of Psychology at Harvard University. He conducts research on language and cognition, writes for publications such as the *New York Times, Time*, and *The New Republic*, and is the author of seven books, including *The Language of Instinct, How the Mind Works, Words and Rules, The Blank Slate*, and most recently, *The Stuff of Thought: Language as a Window into Human Nature.*

George Poste was appointed as Chief Scientist of the Complex Adaptive Systems Initiative at Arizona State University in February 2009. He is a Fellow of the Royal Society, the Royal College of Pathologists, the UK Academy of Medicine and Stanford University. He is also a member of the Council for Foreign Relations, the Defense Science Board of the US Department of Defense and the Institute of Medicine Board on Global Health.

David Quellar has a B.A. in history and philosophy of science from the University of Illinois, and a Ph.D. in biological sciences from the University of Michigan. He has been at Rice University since 1984. He has worked on sexual selection in plants, kin selection in social insects, and is now focusing on using social amoebae as a model system where the genes underlying cooperation and conflict can be identified.

Adam G. Riess is a Professor of Physics and Astronomy at the Johns Hopkins University and a member of the Senior Science Staff at Space Telescope Science Institute. He confirmed the supernova-based discovery of dark energy by detecting the preceding, decelerating epoch of the Universe. His work has been identified by NASA as the number one Achievement of the Hubble Space Telescope's Top Ten Achievements to date.

Alan Rogers is a Professor of Anthropology at University of Utah. His main research interests are in evolutionary genetics and evolutionary ecology. His latest research article "Genetic similarities within and between populations," was published in *Genetics*. In 2005, he received funding from the National Science Foundation to study the evolutionary ecology of the Tchimba of northern Namibia, and served as Principal Investigator for the project.

Sue Rosser is Dean of Ivan Allen College, the liberal arts college at Georgia Institute of Technology. She is also Professor of Public Policy and of History, Technology, and Society. She has written approximately 130 journal articles on the theoretical and applied problems of women and science and women's health. The most recent of the eleven books she has authored or edited is *Women, Science, and Myth*.

John Ruhl investigates the properties and history of the universe by building instruments to measure the cosmic microwave background (CMB) radiation. Using the "Boomerang" instrument flown around Antarctica underneath a stratospheric balloon, he and collaborators were the first to show that the geometry of the universe was very close to flat. Currently he is working on two projects to investigate the inflationary epoch of the universe through its signatures in the CMB.

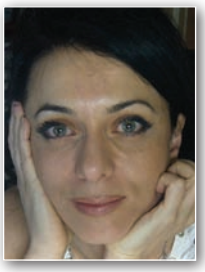
Jerrold Seigel is the William R. Kenan, Jr., Professor of History Emeritus at New York University, where he taught from 1988 to 2006. His first field of historical specialization was the Italian Renaissance, but he has since concentrated on more recent topics. His latest book is *The Idea of the Self: Thought and Experience in Western Europe Since the Seventeenth Century*.

Terrence Sejnowski is an HHMI investigator, the Francis Crick Professor and Director of the Crick-Jacobs Center for Theoretical and Computational Biology at the Salk Institute. He is author of several books including *The Computational Brain* and *Liars, Lovers, and Heroes: What the New Brain Science Reveals About How We Become Who We Are*.

Robert Seyfarth is professor of Psychology at the University of Pennsylvania. He carried out post-doctoral research with Peter Marler at The Rockefeller University, where he and his wife Dorothy Cheney began their 11-year study of vervet monkeys in Amboseli, Kenya. This work is summarized in *How Monkeys See the World*. Between 1992 and 2008 they studied baboons in the Okavango Delta of Botswana, which resulted in *Baboon Metaphysics*.

Everett Shock is a Professor of School of Earth and Space Exploration at Arizona State University. His research group divides their time between building algorithms to estimate thermodynamic data; analyzing water, sediment, rock and biological samples; integrating analytical and thermodynamic data in models of geochemical and microbial processes; and testing ideas about the transport of water and solutes through the environment, the biogeochemical process of subsurface biosphere, and the potential for life on other planets.

Joseph Silk is Savilian Professor of Astronomy at the University of Oxford, and directs the Beecroft Institute for Particle Astrophysics and Cosmology. Most of his scientific research is related to the cosmic microwave background and cosmology. He has published more than 600 articles and several popular books. He is a fellow of the Institute of Physics, the American Association for the Advancement of Science, the American Physical Society, the Royal Society and the American Academy of Arts and Sciences, and was awarded the Gold Medal of the Royal Astronomical Society.



Maria Spiropulu is an experimental particle physicist currently working at the Organisation Européenne pour la Recherche Nucléaire (CERN) and its Large Hadron Collider (LHC) Compact Muon Solenoid experiment. Her research is targeting the discovery and study of physical phenomena that extend our current understanding of the composition and characterization of the universe. She was recently elected a Fellow of the American Association for the Advancement of Science.

David Stevenson is the George Van Osdol Professor of Planetary Science at the California Institute of Technology and devotes most of his research to understanding the origin, evolution and structure of planets, including planet Earth, planets outside our solar system, and large satellites such as Titan. His work is stimulated by spacecraft observations and guided by the applications of physics and chemistry to the properties of materials in these bodies.

Joan E. Strassmann has been at Rice University in Houston, Texas since 1980. She is interested in how cooperation evolves, how conflicts are resolved, and in the genetic underpinnings of altruism. She spent many years studying social wasps, but for the last decade has concentrated on social amoebae as a genetic and genomic system for elucidating the mechanisms underlying social evolution. She is married to David Queller and they have three children.

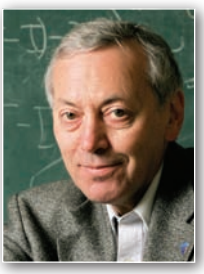
Ian Tattersall is currently the Curator of the Division of Anthropology at the American Museum of Natural History. He is also an Adjunct Professor for the anthropology programs at Columbia University and the Graduate School of CUNY. His primary research interests include human and nonhuman primate evolution, origin of Homo sapiens, integration of evolutionary and systematic theory with the human fossil record. Since 1968, he has published over 320 scientific publications including 16 books.

Michael S. Turner is a theoretical astrophysicist and the Bruce V. and Diana M. Rauner Distinguished Service Professor at the University of Chicago. Turner helped to pioneer the interdisciplinary field of particle astrophysics and cosmology, and led the National Academy study Quarks to the Cosmos that laid out the strategic vision for the field, including NASA and DOE's Joint Dark Energy Mission (JDEM) which is now in its final planning stages.

Neil deGrasse Tyson is an astrophysicist and Director of the Hayden Planetarium in New York City. He has received honorary doctorates from nine universities, as well as a Medal of Excellence from Columbia University and the NASA Distinguished Public Service Medal. He is a celebrated science popularizer and Host of the PBS program *NOVA scienceNOW*. He writes monthly essays for *Natural History* magazine and has published nine books, most recently *The Pluto Files*.

Sander van der Leeuw is an archaeologist and historian. He studies long-term dynamics of socio-environmental systems, reconstruction of ancient technologies, regional man-land relationships, invention and innovation, urban dynamics, geographic information systems, modeling and complex systems theory. His publications include 17 books and over a hundred papers and articles on archaeology, ancient technologies, socio-environmental and sustainability issues. He is Director of the School of Human Evolution and Social Change at Arizona State University.

J. Craig Venter is Founder and President of the J. Craig Venter Institute (JCVI), and founder and CEO of Synthetic Genomics Inc. In 1998, Dr. Venter founded Celera Genomics to sequence the human genome. This research culminated with the publication of the human genome in the journal *Science*. Dr. Venter is the author of more than 200 scientific articles and the recipient of numerous honorary degrees, public honors, and scientific awards.



Alex Vilenkin is best known for his work on cosmic strings, eternal cosmic inflation, and on creation of the universe from nothing. He is also the author of the popular book, *Many worlds in one: the search for other universes*. He is currently the L. and J. Bernstein Professor in Evolutionary Science and Director of the Tufts Institute of Cosmology at Tufts University.

Peter Ward is a Professor of Biology, Earth and Space Sciences, and Adjunct Professor of Astronomy at The University of Washington. He is a Principal Investigator at the NASA Astrobiology Institute. Ward has published 15 books, most recently *Under a Newly Green Sky: The Global Warming Mass Extinctions.* Ward has also been seen on a variety of television news programs, such as ABC News with Judy Muller, the O'Reilly Factor, CNN, MSNBC, and Art Bell's Coast to Coast radio program.

Steven Weinberg teaches in the Physics and Astronomy Departments of the University of Texas. His honors include the Nobel Prize in Physics and National Medal of Science, election to the National Academy of Sciences and Royal Society, and sixteen honorary degrees. He has written over 300 articles and 12 books, the latest a graduate-level treatise *Cosmology*. Educated at Cornell, Copenhagen, and Princeton, he then taught at Columbia, MIT and Harvard.

Polly Wiessner is a Professor of Anthropology at the University of Utah. She has conducted research among the Kung (Ju/'hoansi) Bushmen of the Kalahari Desert over the past 35 years on subsistence, reciprocity, social security systems to reduce risk, and style and social information in material culture. She has published numerous books and articles including *Food and the Status Quest* (with W. Schiefenhoevel), and *Historical Vines: Enga Networks of Exchange.*

Frank Wilczek has received many prizes for his work in physics, including the Nobel Prize of 2004 for work he did as a graduate student at Princeton University, when he was only 21 years old. He is known, among other things, for the discovery of asymptotic freedom, the development of quantum chromodynamics, the invention of axions, and the exploration of new kinds of quantum statistics (anyons).

Rogier Windhorst's research lies in astronomy, cosmology, galaxy formation and evolution, the cosmic dark ages and the epoch of First Light, and astronomical instrumentation. He one of the six Interdisciplinary Scientists for NASA's 6.5 meter James Webb Space Telescope to be launched in 2013. His group at Arizona State University plans to use JWST to map the epoch of First Light in detail.

Edward D. Young is Professor of geochemistry and cosmochemistry at UCLA. His research interests include the origins of the solar system, asteroid hydrology, and the physical chemistry of isotope fractionation processes in rocks, in protoplanetary disks, and in the interstellar medium.

THURSDAY APRIL 2 PRE-SYMPOSIUM EVENTS

1:30–2:45 PM **Nobelists Blumberg, Gross, and Weinberg Visit Phoenix North Public High School**

2:30–4 PM **Workshop on Science Writing at Cronkite School**
Panel moderated by Claudia Dreifus (*New York Times*)
Dennis Overbye (*New York Times*), Sharon Begley (*Newsweek*), Ira Flatow (*Science Friday* on NPR), Charles Petit (*Knight Science Journalism Tracker*), Marietta Di Christina (*Scientific American*), Lawrence Krauss (ASU), Marc Kaufmann (*Washington Post*)

FRIDAY APRIL 3 ASU CAMPUS

8:30–10 AM **Workshop for Journalists at Cronkite School**
Richard Dawkins: Forefront questions on evolutionary biology
Lawrence Krauss: Forefront questions on the beginning of time

11 AM–1 PM **Science Friday**, Katzin Auditorium

1-2 PM Lunch with Barrett Honors College students

2–5:30 PM **Session 1: The Universe, Multiverse, Physical Laws**
Katzin Auditorium, Arizona State University

2 PM **Welcome** Sid Bacon, Lawrence Krauss
The Big Questions Frank Wilczek

2:10–3:10 PM **Panel 1: How Far Back Can We Go?**
Moderator: Michael Turner
Steven Weinberg: How can we probe inflation?
James Peebles: Is all well with the universe?
Brian Greene: what can string theory do?
Lawrence Krauss: Are there fundamental theoretical limits?
Stephen Hawking: The origin of the universe

3:10–3:25 PM Break

3:25–4:20 PM **Panel 2: Is Our Universe Unique, and How Can We Find Out?**
Moderator: Paul Davies
Andrei Linde: Inflationary multiverse and string theory landscape
Alan Guth: Eternal inflation, measures and anthropics
David Gross: What is wrong with anthropics
Sheldon Glashow: Is particle physics over?
Alex Vilenkin: Mediocrity as a principle

4:20–5:25 PM **Panel 3: New Windows on the Universe: What is Knowable?**
Moderator: Wendy Freedman
Barry Barish: Gravitational Wave Observatory (LIGO) and International Linear Collider (ILC): Which first? Which best?
Adam Reiss: Do supernovae have anything else to tell us?
John Ruhl: Is the Cosmic Microwave Background (CMB) a tool whose time is up?
John Mather: The next generation space telescope: so what?
Maria Spiropulu: The Large Hadron Collider (LHC): when will it work, what will It do?
Roger Blandford: The gamma ray sky

5:30–6:30 PM **Cocktail Reception, ASU Art Museum**

CONTINUES ON NEXT PAGE

SATURDAY APRIL 4 BOULDERS

8:30–11:30 AM **Session 2: The Galaxy, Planets and Life**
Conference Room at Boulders

8:30–9:20 AM **Panel 1: Do We Have a Successful Theory of Galaxy and Star Formation and How Will We Know**
Moderator: Lawrence Krauss
Ben Moore: How low can we go? Understanding galaxy formation in a Cold Dark Matte (CDM) universe
Carlos Frenk: Dark matter rules
Joseph Silk: Outstanding puzzles, Initial Mass Function (IMF), and more
Rogier Windhorst: James Webb Space Telescope (JWST) and its promise

9:20–10:20 AM **Panel 2: How Common are Earth-like Planets?**
Moderator: Ariel Anbar
Alex Halliday: When do solar systems form earth-like planets?
David Stevenson: Can moonless "earths" support life?
Edward Young: What are the building blocks of earth-like planets?
Steve Desch: Where do planets get their water, and where can most liquid water be found?
Philip Christensen: Was Mars ever "Earth-like"?
Jade Bond: Is the chemistry of our solar system unusual or unique?

10:20–10:35 Break

10:35–11:30 AM **Panel 3: How Does Life Originate and How Do We Recognize It?**
Moderator: Kip Hodges
Baruch Blumberg: What key observations are necessary to establish the presence of past or present life on other worlds?
Paul Davies: Is the life we know the only life there is?
Antonio Lazcano: How do we define the transition from a pre-biotic to a biotic earth?
Stephen Mojzsis: Paleontologic evidence notwithstanding, what was the earliest life on Earth?
Everett Shock: Are there definitive biosignatures for life on other planets and, if so, what are they?

11:30–2:15 PM Lunch

2:15–5:00 PM **Session 3: Origin of Species, Evolution, Human Origins**
Conference Room at Boulders

2:15–3:10 PM **Panel 1: Origin and Evolution of Life and Phenotypic Innovations**
Moderator: Manfred Laubichler
George Poste: Can we design new cells from scratch?
Doug Erwin: Extinction and the origin and diversification of body plans
Kevin Peterson: Complexity and constraints in animal evolution
Randy Nesse: Disease as a by-product of social organization?
Peter Ward: Evolution

3:10–3:20 PM	Break
3:20-4:05 PM	**Panel 2: Origin and Evolution of Sociality** Moderator: Jürgen Gadau Richard Dawkins: Darwin's dilemma: how can we explain altruistic behavior? Bert Hölldobler: The origin of eusociality as a major transition in evolution Joan Strassman: Cooperation and conflict: two intertwined themes in social evolution David Queller: Are the basic evolutionary principles that explain the evolution of social life true for bacterial mats, slime molds, eusocial insects, and primates, including humans?
4:05–5 PM	**Panel 3: What Is the Origin of Human Uniqueness?** Moderator: William Kimbel Alan Rodgers John Fleagle Ian Tattersall Donald Johansen Curtis Marean

SUNDAY APRIL 5 BOULDERS

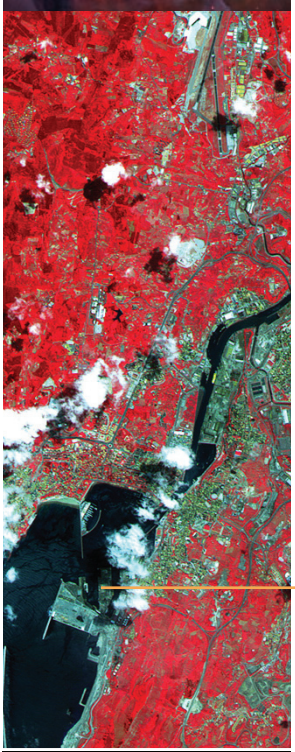
9:30–12:40	**Session 4: From Consciousness, Complex Cognition and Language to Culture: Cooperation, Morality and Institutions** Conference Room at Boulders
9:30–10:40 AM	**Panel 1: Consciouness, Complex Cognition, and Language** Moderator: Roger Bingham Steven Pinker: Language and cognition Patricia Churchland: Consciousness in corvids and others: sleep, dreaming, mirror recognition, declarative memory and the fruit fly fight club Robert Seyfarth: Theory of mind in primates Jerrold Seigel: The idea of Self Terrence Sejnowski: What is learning?
10:40–10:50 AM	Break
10:50–12:05 AM	**Panel 2: Human Uniqueness, Culture and Morality** Moderator: Roger Bingham Sue Rosser: How does power change our consciousness of gender and origin? Kim Hill: What makes humans unique? Rob Boyd: What are the unique features of human cultural capacity that allow individually learned innovations to "stick" and be transmitted? Robert Kurzban: Some have said that human uniqueness lies in our capacity for large-scale cooperation and moral behavior. What are the origins of these human traits? Polly Wiessner: How did our ancestors maintain significant cooperative ties across much larger stretches of space and time than any other organism? Jonathan Haidt: What is morality, and why does it vary?

CONTINUES ON NEXT PAGE

12:05–12:15 PM	Break
12:15–12:45 PM	**Panel 3: The State, Social Norms, and Institutions** Moderator: Roger Bingham A.C. Grayling: What does philosophy have to contribute to a more "human" understanding of the implications of evolution by natural selection? Michael Macy: What are the origin and impact of social norms on individual and collective outcomes? Margaret Levi: What is the origin of the state, and what are the causes of its failure?
12:45 PM	Origins Conference Adjournment

MONDAY APRIL 6 GAMMAGE AUDITORIUM, ASU TEMPE

9:30 AM–6 PM	**Public Symposium**
9 AM	Welcome
9:30 AM–12:30PM	Steven Pinker Donald Johanson Brian Greene
1:45–5:45 PM	Richard Dawkins J. Craig Venter Lawrence Krauss
	Nobel Panel Moderator: Ira Flatlow Baruch Blumberg David Gross Walter Gilbert Sheldon Glashow John Mather Frank Wilczek
5:45-7:15 PM	**Reception**
7:15–8:30 PM	World Champion of Magic, Jason Latimer
	Panel on Science and Society Moderator: Roger Bingham Hugh Downs Claudia Dreifus Ann Druyan Lucy Hawking Neil deGrasse Tyson
8:30 PM	Stephen Hawking: Why go into space? Presented by Lucy Hawking



Origins Symposium

Origins Symposium Program Committee

Ariel Anbar	Lawrence Krauss
Sid Bacon	Manfred Laubichler
Phil Christensen	Deirdre Meldrum
Paul Davies	Jon Meyers
Michael Hechter	Robert Page
Kim Hill	George Poste
Kip Hodges	Hava Samuelson
Bert Hölldobler	Dan Sarewitz
Don Johanson	Sander van der Leeuw
Bill Kimbel	Quentin Wheeler
Sally Kitch	Rogier Windhorst

In addition, the following individuals made significant contributions to the success of the symposium, Jessica Lee, Carole Hughes, Ed Sylvester, Virgil Renzulli, Jim Buizer, Hugh Downs, Megan Fisk, Jeanette Perez, John Booth, Jacob Sahertian, Charles Kazilek, Michael Dambrowski, and Terri Cranmer.

Support

We are happy to acknowledge support from a variety of sources, which made the Origins Symposium possible:

Richard Morrison Foundation

The Research Corporation

Ernest W. Moody

The Ghelfi Family

The Katz Family

The Arizona State University Foundation

Arizona State University

Notes