

MACARTHUR FELLOWS FOR 2005

BIOGRAPHIES

FOR RELEASE – **EMBARGOED** UNTIL 12:01 A.M. EDT, Tuesday, September 20, 2005

Marin Alsop

Conductor

Bournemouth Symphony Orchestra

Poole, England

Age: 48

Marin Alsop, principal conductor of the Bournemouth Symphony Orchestra and music director of the Cabrillo Festival of Contemporary Music, is among the most accomplished conductors working today. In addition to her masterful conducting technique and visionary artistic programming, Alsop is distinguished by her extraordinary ability to communicate, both with her orchestra and with her audience, successfully translating her musical ideas into symphonic sound with a signature style. In presenting concerts, she often addresses audiences directly and previews short passages demonstrating themes and motifs of pieces to be played. These engaging presentations demystify challenging music for a wide range of audiences. While honoring classical music heritage, Alsop is also deeply committed to bringing the work of living composers to orchestras, audiences, and critics around the world. Her discography ranges from gospel recordings to traditional symphonies to the music of contemporary American composers. Through her musicality, her skill in making the unusual understandable, and her championing of contemporary music, Alsop defies stereotypes and offers a new model of leadership for orchestras in the U.S. and abroad.

Marin Alsop studied at Yale University (1973-75) and received a B.M. (1977) and an M.M. (1978) from The Juilliard School. As a violinist, she performed with the New York Philharmonic, the New York City Ballet, the New York Chamber Symphony, and the American Composers Orchestra, among others. She studied conducting with Carl Bamberger, Harold Farberman, Leonard Bernstein, Gustav Meier, and Seiji Ozawa, and served as music director for the Eugene Symphony Orchestra (Oregon) and the Long Island Philharmonic (1989-95). In 1991, she was appointed music director of the Cabrillo Music Festival, and in 1993, music director of the Colorado Symphony. Alsop assumed her current position, principal conductor of the Bournemouth Symphony Orchestra, in 2001. Beginning September of 2007, Alsop will become the music director of the Baltimore Symphony Orchestra.

Ted Ames

Fisherman

Unaffiliated

Stonington, Maine

Age: 66

Ted Ames, a long-term, Maine lobster and ground fisherman, has fused the roles of fisherman and applied scientist in response to increasing threats to the fishery ecosystem resulting from decades of over-harvesting. Ames grew up in a fishing family on one of Maine's remote offshore islands and studied biochemistry at the University of Maine. Having spent several decades of his life at sea, he has witnessed dramatic shifts in the economic landscape throughout the Gulf of Maine, specifically in jobs and shoreside infrastructure. In an effort to address these changes and develop new fisheries management practices for the affected areas, Ames undertook detailed studies of spawning, habitat, and fishing patterns. His studies, reinforced by a rigorous methodology, draw distinctively from the anecdotal experiences of aging fishermen to map historical patterns and chart the evolution of current conditions. His work paints a scientifically compelling picture of the complexity of the fish population structure in the Gulf and identifies new strategies for individual and institutional marine management in the region. Ames has now established the Penobscot East Resource Center to conduct additional studies of fishing patterns, past and present, and put to further use his trademark approach of combining fishery science and fishermen's knowledge in the interest of protecting essential fish habitats.

Ted Ames received an M.S. (1971) in biochemistry from the University of Maine, Orono. He is an independent researcher, commercial fisherman, and a founding member of the Stonington Fisheries Alliance. He served as executive director of the Maine Gillnetters Association, as marine resources director for Maine's sustainable fisheries organization, the Island Institute, as president and laboratory director of Alden/Ames Laboratory, and for many years as an advisor to the New England Fisheries Management Council. He is currently a practicing fisherman and serves as chair of the Penobscot East Resource Center, a community organization that provides support to local groups engaged in marine management and fisheries stewardship.

Terry Belanger

Rare Book Preservationist

University Professor and Honorary Curator of Special Collections

University of Virginia

Charlottesville, Virginia

Age: 64

Terry Belanger is a historian, collector, and protector of one of humankind's greatest inventions: the book. To support the study of the book's long history, Belanger created a teaching and archive facility, the Rare Book School (RBS), in 1983 as part of Columbia University's School of Library Service; in 1992, he moved it to its current home at the University of Virginia. The RBS functions as an independent, non-profit institute devoted to the histories of manuscripts, print, electronic text, and everything in between. It transcends the limitations of traditional degree programs by making its wide-ranging offerings available to a broad range of professionals interested in studying and preserving these cultural artifacts; historians, literary scholars, librarians, conservators, collectors, and book artists attend RBS courses each year. In the classroom, Belanger uses original tools and materials to provide students with hands-on experience and to emphasize the relationship between the physical and intellectual structure of the book. He assiduously collects items related to bookmaking, from the remains of incunabula (the first printed books of the fifteenth century) and their handwritten precursors to books demonstrating the range of bindings and structures, to samples of materials from which books have been constructed. With thousands of former students currently at work in the field and offshoots of his programs in California, France, Australia, and New Zealand, Belanger is making the world a more secure place for the irreplaceable legacy of the book.

Terry Belanger received a B.A. (1963) from Haverford College and an M.A. (1964) and Ph.D. (1970) from Columbia University. He was on the faculty of the School of Library Service at Columbia University (1971-1992), where he served as assistant dean (1980-86). He established the Book Arts Press (1971) at Columbia as a bibliographical laboratory for the training of rare book and special collections librarians and antiquarian booksellers. In 1983, he instituted the Rare Book School, also at Columbia. Belanger moved both the Book Arts Press and Rare Book School to the University of Virginia in 1992, where he now holds the position of University Professor and Honorary Curator of Special Collections.

Edet Belzberg

Documentary Filmmaker

Unaffiliated

New York, New York

Age: 35

Edet Belzberg is a documentary filmmaker whose films are distinguished by her choice of subjects, in-depth treatment of time and place, and elegant storytelling. In Belzberg's signature film, *Children Underground*, she follows and films a group of homeless children living in a train station in Bucharest, Romania. Raw, graceful, and insightful, *Children Underground* personalizes the often dangerous and always chaotic and uncertain world of youngsters casually abandoned by their families and the larger society. Overcoming the obstacles of language, culture, and place, she records the individual and collective daily struggles of the five main characters with an unflinching, compassionate eye, managing at the same time to win the trust of children whose capacity for trust is all but depleted. Critically-acclaimed throughout the U.S. and Europe, the film has focused international attention on the social and institutional disregard of child welfare in post-communist Romania. Belzberg's characteristically intense and detailed treatment of the lives of children again defines her most recent and just completed film, *Gymnast*. While the film focuses on a completely different group of children in a totally different setting (the top three American girls preparing for the 2000 Olympics), *Gymnast* is a bold and original treatment of children under extreme conditions as it explores the motivations of individual stakeholders in the Olympic success of these teenagers. Future projects of this young filmmaker promise other enduring revelations into the lives of overlooked subjects and the realities of under-explored conditions.

Edet Belzberg received a B.A. (1991) from the University of Colorado, Boulder, and an M.A. (1997) from Columbia University's School of International and Public Affairs. She has been a frequent lecturer at Columbia's School of Journalism and has taught at New York University's Tisch School of the Arts (2001).

Majora Carter

Urban Revitalization Strategist

Founder and Executive Director

Sustainable South Bronx

Bronx, New York

Age: 38

Majora Carter, of the South Bronx, is determined to make her community more livable, greener, and healthier than it is today. The founder and director of Sustainable South Bronx (SSB), Carter is a relentless and charismatic urban strategist who seeks to address the disproportionate environmental and public health burdens experienced by residents of the South Bronx. Working in partnership with local government, businesses, and neighborhood organizations, she creates new opportunities for transportation, fitness and recreation, nutrition, and economic development. Returning to her native Hunts Point section of the South Bronx after completing an MFA, Carter first sought to deepen the emphasis on the arts in the South Bronx. It wasn't long, however, before she was engaged in battle over New York City's plan for a solid waste management plant to process 40 percent of the city's garbage at a facility on the Hunts Point waterfront. Successfully diverting this plan, SSB and other groups envisioned a new relationship with the Bronx River and embarked on projects that built a park on the site of a former concrete plant, enabled public waterfront access where the shore was once littered with industrial scrap, developed an ecological restoration workforce to protect and maintain the natural environment, and raised funds to conduct a feasibility study for the establishment of a bike/pedestrian greenway along the waterfront. Making the connection between green space and health, Carter added a community education focus to the work of the SSB around fitness, food choices, and air quality. As part of this effort, she established a community market and introduced green roof technology. Today, Majora Carter is profoundly transforming the quality of life for South Bronx residents.

Majora Carter received a B.A. (1988) from Wesleyan University and an M.F.A. (1997) from New York University. Carter served as project director (1997-98) and associate director of community development (1998-2001) for The Point Community Development Corporation, working on youth development and community revitalization in Hunts Point. She founded Sustainable South Bronx in 2001 and serves as its executive director.

Lu Chen

Neuroscientist

Assistant Professor of Neurobiology

University of California / Berkeley

Berkeley, California

Age: 33

Lu Chen is a neuroscientist who is probing the mysteries of the synapse, the anatomical structure that mediates chemical signals sent from one neuron to another. Specifically, she explores the mechanisms underlying the function of synapses that use the neurotransmitter glutamate (the most common excitatory neurotransmitter in the central nervous system). This transmitter interacts with postsynaptic neurons with several different types of receptors: kainate, NMDA, and AMPA. Studies of a genetically mutated mouse strain showed that AMPA receptor function is disrupted by the lack of stargazin, a protein homologous with a subunit of the calcium channel. Through a combination of molecular genetic, cell biology, biochemical, and electrophysiologic approaches, Chen and her colleagues were able to demonstrate that stargazin plays a key role in the structural integrity of the AMPA receptor complex. Chen created a line of non-neuronal cells that express each of the AMPA receptor components; in co-culture with hippocampal neurons, she showed that the neurons induced the formation of functional AMPA receptors in the non-neuronal cell line, and that stargazin represents an essential element of the receptor assembly. This observation opens a new avenue for exploring the role of accessory proteins in synaptic formation and plasticity. The potential impact is tremendous not just for understanding the basic biology of learning and memory, but also in the development of new kinds of treatments for neurological and psychiatric diseases.

Lu Chen received a B.S. (1993) from the University of Science and Technology of China, and a Ph.D. (1998) from the University of Southern California. Chen was a postdoctoral fellow at the University of Southern California (1998-99) and the University of California San Francisco (1999-2002). Since 2003, she has been an assistant professor of neurobiology at the University of California, Berkeley, where she is also a member of the Helen Wills Neuroscience Institute. Her research has been published in such academic journals as *Nature*, the *Journal of Neuroscience*, and the *Proceedings of the National Academy of Sciences USA*.

Michael Cohen

Pharmacist

President

Institute for Safe Medication Practices

Huntingdon Valley, Pennsylvania

Age: 61

Michael Cohen is a pharmacist with a passion for patient safety and a commitment to reducing preventable drug and drug delivery mistakes that kill thousands of people each year in the United States. An early pioneer in an international movement to address medication error, Cohen is founder and president of the Institute for Safe Medication Practices (ISMP), a nonprofit clearinghouse for the distribution of impartial medical safety information to the healthcare community. As the number of available drugs and prescriptions filled each year continues to soar, many with look-alike or sound-alike names, Cohen is a recognized leader in promoting increased consumer vigilance, drug industry accountability, and practitioner responsibility. Through ISMP, he has championed improvements in drug naming, labeling, packaging, delivery systems, and regulation. At the cornerstone of his efforts, Cohen co-founded the continuous, voluntary, and confidential Medication Error Reporting Program (now administered by U.S. Pharmacopoeia), for medical professionals to learn about and understand the causes of errors across the nation. Where once errors were undisclosed and viewed as embarrassing to the healthcare industry, the active collection of these reports has helped generate practical and early responses and to combat potentially widespread and dangerous outcomes. For more than three decades, Cohen has played key roles in bringing about numerous corrections in error-prone products and practices. Today, he continues to be a major force in giving national visibility to the ubiquitous and serious problem of medication errors.

Michael Cohen received a B.S. (1968) and an M.S. (1984) from Temple University. He also received honorary degrees in science from the University of the Sciences of Philadelphia (2001), in science from Long Island University (2005), and in public service from the University of Maryland (2005). Cohen has held pharmacy leadership positions at Temple University Hospital (1970-83) and Quakertown Community Hospital (1983-92). Since 1976, he has taught at the Temple University School of Pharmacy, where he is now an adjunct associate professor. He is the editor of the book, *Medication Error* (1999), and the co-editor of the newsletter, *ISMP Medication Safety Alert!*. Cohen currently serves as president of the Institute for Safe Medication Practices, which he founded in 1993.

Joseph Curtin

Violinmaker

Principal

Joseph Curtin Studios

Ann Arbor, Michigan

Age: 52

Joseph Curtin is a master violinmaker who crafts original, world-class violins for the twenty-first century. A luthier with research interests in nontraditional materials, nontraditional structures, and violin acoustics, Curtin weds acoustic science to the art of violinmaking and merges time-honored techniques with new materials and design. Having first excelled in the traditional practice of creating replicas of the great Italian instruments of Stradivari and Guarneri, Curtin is now confronting the dilemma of the evolution of the violin, creating entirely new instruments that incorporate contemporary materials and aesthetics. In so doing, he has collaborated with leading acoustics researchers in the field, experimenting with violin acoustics, playability, sound, and ergonomics. His approach consists of an artful synthesis of the old and new and offers clear evidence that the centuries-old art of violinmaking is still evolving. Using new methods of construction and affordable modern composite materials to improve the instrument's response and sound, he produces violins and violas of remarkable tone, power, projection, and timbre. Driven by a desire to experiment and innovate, Curtin builds distinctive violins of enduring quality that are increasingly recognized worldwide as instruments of the highest order.

Joseph Curtin studied violin at the University of Western Ontario (1971-73) and music and philosophy (1974-77) at the University of Toronto. He abandoned musical performance for lutherie when he came under the tutelage of violinmaker, Otto Erdesz, in 1977. He apprenticed with Erdesz for several years and worked in workshops in Italy and France. In 1985, he established a workshop with partner, Gregg Alf, with whom he built instruments for twelve years under the name Curtin & Alf. He founded his independent workshop, Joseph Curtin Studios, in 1997. He also co-directs the Violin Society of America's acoustic workshop at Oberlin College, is a trustee and contributing editor for the Catgut Acoustical Society, and is a regular contributor to *The Strad* magazine.

Aaron Dworkin

Music Educator

Founder and President

The Sphinx Organization

Detroit, Michigan

Age: 35

Aaron Dworkin is a talented violinist, charismatic arts educator, and the Founder and President of the Detroit-based Sphinx Organization. He and his organization have expanded access for increased numbers of minorities to careers in classical music around the country. Through his efforts, he has transformed the lives of many African-American and Latino musicians and changed the landscape of classical music in America. As minorities currently comprise only 1.5 percent of professional symphony players in the United States, Sphinx set a course to attract young men and women to classical music, countering their perception that such careers face insurmountable barriers and providing them with rigorous training, affordable instruments, and performance opportunities. The results have been to turn out fresh new talent second to none and to fill a void recognized by all. Determined to reverse the isolation of whole populations of young musicians from the beauty, value, and meaning of classical music, Dworkin began by organizing an annual national competition for minority string players. His programs grew rapidly to encompass an orchestra entirely composed of African-American and Latino musicians; a summer training program for underprivileged string players; music education outreach programs in Detroit public schools; an instrument fund for players unable to afford them; and a scholarship fund for deserving musicians who otherwise could not go on for advanced training. Through his programs and nurturing support, Dworkin assures access and enriches symphonies across the country.

Aaron Dworkin received a B.M. (1997) and an M.M. (1998) from the University of Michigan. In 1996, Dworkin founded The Sphinx Organization, for which he now serves as president. A frequent speaker on youth and minority involvement and career development in classical music, he also serves as an advisor for several education and music organizations, including the University Musical Society and the Rachel Elizabeth Barton Foundation.

Teresita Fernández

Sculptor

Unaffiliated

New York, New York

Age: 37

Teresita Fernández is a sculptor who integrates architecture and the optical effects of color and light to produce exquisitely constructed, contemplative spaces. In her sculptural environments, Fernández alters space to create illusions, subtly modifying the physical sensations of the viewer and dramatizing the role architecture plays in shaping our lives and perceptions. Her room-sized installations evoke quietude and mystery, reflecting such diverse aesthetic influences as Roman and Ottoman architecture and Japanese gardens. In other works, she creates large-scale, referential constructions, such as a pool, a waterfall, and a sand dune stripped of specific context. With these pared-down pieces, she invites viewers to draw from their personal memories and observations. Employing common building materials to startling effect – tiny plastic cubes form a shimmering rainbow and acrylic rods suggest the flexible strength of bamboo – she inspires viewers to see a new relationship between built environments and the natural world. With lyrical and immaculately executed indoor and outdoor works, Fernández is pushing the boundaries of sculpture and installation art into the fields of architecture and landscape architecture.

Teresita Fernández received a B.F.A. (1990) from Florida International University and an M.F.A. (1992) from Virginia Commonwealth University. Her work has appeared in numerous solo and group exhibitions at such national and international venues as the Fabric Workshop and Museum, the Corcoran Gallery of Art, the Museum of Contemporary Art, Miami, and the National Museum of Modern Art, Tokyo. Fernández was an artist-in-residence at Artpace San Antonio (1998) and a fellow of the American Academy in Rome (1999). She lives and works in New York City.

Claire Gmachl

Laser Engineer

Associate Professor of Electrical Engineering

Princeton University

Princeton, New Jersey

Age: 38

Claire Gmachl is an experimental scientist working at the intersection of technology and fundamental physics in the fields of optics and semiconductor laser technology. A wizard at imagining and creating new designs for solid-state lasers, Gmachl's pioneering work has led to critical advances in the development of Quantum Cascade (QC) lasers. QC lasers are a rapidly evolving class of high-performing, mid-infrared, semiconductor light sources. The lasers designed by Gmachl and her colleagues are noteworthy for their considerable wavelength tunability, high-power operation, high-speed modulation capabilities, and seemingly unlimited design potential. She has demonstrated the versatility and promise of mid-infrared light sources for a wide range of applications, including trace gas sensing in the environmental, industrial, and medical fields, and free-space optics in wireless communications. Her recent achievements include the development of QC microlasers and new hybrid devices, which include quantum cascade structures and nonlinear components, dramatically extending the wavelength range of QC technology. These designs have direct applications to environmental monitoring, clinical diagnoses, spectroscopy, and chemical process control. With her combination of technological flair and deep understanding of physical concepts, Claire Gmachl translates complex principles into original and practical devices that advance our understanding of optical device designs and promise to address a wide variety of engineering challenges.

Claire Gmachl received an M.S. (1991) from the University of Innsbruck and a Ph.D. (1995) from the Technical University of Vienna. She has been a member of the technical staff (1992-94) at the Technical University of Munich and an assistant professor (1995-96) at the Technical University of Vienna. The majority of her work on QC lasers was done as a member of the technical staff (1996-2003) at Lucent Technologies-Bell Laboratories. Gmachl is currently an associate professor of electrical engineering at Princeton University.

Sue Goldie

Physician / Researcher

Associate Professor of Health Decision Science

Harvard University / School of Public Health

Boston, Massachusetts

Age: 43

Sue Goldie is a physician and public health researcher whose leadership, rigorous analyses, and creative interventions are transforming women's healthcare around the world. Incorporating mathematical modeling, the science of medical decision-making, and risk analysis, she has successfully identified important new strategies to improve women's health in underserved populations. Together with her collaborators, Goldie has developed complex and comprehensive epidemiological models for diseases such as HIV, gonorrhea, chlamydia, herpes, and hepatitis C. By weighing disease characteristics and quantitatively assessing possible health interventions for potential populations, Goldie has translated her models into actionable information to guide global health interventions and policies. A focus of Goldie's research is the human papilloma virus (HPV) and its link to cervical cancer, the most common cause of cancer death in women worldwide. Combining clinical, scientific and mathematical methodology, Goldie has demonstrated that non-physicians can be trained to conduct direct visual inspections or HPV testing to detect early cervical cancer, a more practical and cost-effective approach than the expensive and technically challenging Pap smear screening method. She has taken her findings to the field, creating practical, sustainable cervical cancer-screening programs in Haiti, India, Kenya, Peru, South Africa, and Thailand. Indeed, by bridging the gap between clinical researchers and global policy-makers, Goldie has already enhanced the lives of tens of thousands of women and has the potential to do so on a broader scale still.

Sue Goldie received her M.D. (1988) from Albany Medical College, and completed her residency (1988-91) at Yale University-New Haven Medical Center. She returned to classes while still seeing patients, and received her M.P.H. (1997) from Harvard University. She was a fellow at Harvard's Center for Risk Analysis (1997-99) and is currently an associate professor of health policy and decision science in the Department of Health Policy and Management at the Harvard School of Public Health.

Steven Goodman

Conservation Biologist

Field Biologist, Department of Zoology

The Field Museum of Natural History

Chicago, Illinois

Antananarivo, Madagascar

Age: 48

Steven Goodman is a conservation biologist who studies and documents the endangered, diverse, and previously unknown plants and animals of Madagascar. In terms of biodiversity and conservation, no single country in the world is more dynamic, more diverse, and more understudied than Madagascar. A researcher at Chicago's Field Museum of Natural History, Goodman spends most of his time in Madagascar where he works with international conservation groups and local biologists to record and preserve ecosystems increasingly threatened by rapid deforestation and population growth. He also founded and leads the Ecological Training Program (ETP) that mentors, trains, and prepares local Malagasy biologists in pressing conservation issues, a model that is being replicated elsewhere in ecologically threatened regions in Africa and around the world. A tenacious researcher, Goodman has braved extreme conditions to identify dozens of new bird, insect, and mammal species, to conduct rigorous biological surveys and inventories, and to transform the scientific knowledge of the region. He is the co-editor and lead author of *The Natural History of Madagascar*, the definitive book on the island's geology, soils, climate, forest and human ecology, plants, invertebrates, fishes, reptiles, birds, and mammals. With inexhaustible energy, Goodman has brought Madagascar to the forefront of international conservation, demonstrating the urgent need for preservation and the power of mentoring future custodians of the world's biological richness.

Steven Goodman received his B.S. (1984) from the University of Michigan and undertook graduate study at the University of Michigan, completing all but his dissertation, in favor of conducting independent research for the American Museum of Natural History and the National Geographic Society. He later earned his Ph.D. (2000) from the University of Hamburg and received an H.D.R. (2005) from the Université Paris-Sud XI, Orsay. Since 1989, he has been a field biologist on staff in the Department of Zoology at the Field Museum of Natural History, Chicago. He conducts research and collaborates with the World Wildlife Foundation and the University of Antananarivo on ecological training programs. In honor of Goodman, scientists recently named a newly identified species of lemur *Microcebus lehilahytsara*, the latter part of which means "good man" in Malagasy.

Pehr Harbury

Biochemist

Associate Professor of Biochemistry

Stanford University

Stanford, California

Age: 40

Pehr Harbury is a biochemist who explores the structure, activity, and synthesis of proteins with the aim of developing more potent and more specific drugs for the treatment of disease. Early in his career, he focused on rational protein design, based on first-principles of amino acid structural chemistry. Most functional proteins consist of amino acid side chains attached to a protein backbone. Harbury developed a method for accurately predicting main- and side-chain structures, even for complex multimers. To demonstrate the power of his calculation, he and his colleagues synthesized proteins with unnatural, right-handed supercoiled structure and showed that they were able accurately to predict structures that had never previously existed. To improve understanding of side-chain functionality, Harbury developed an assay for testing the interaction of substrate and specific amino acids. Most recently, Harbury has introduced an efficient and effective method for using *in vitro* evolution to control combinatorial synthesis of small molecules. With this technique, he is able to tether to a single molecule the information needed to synthesize more of it. When combined with an instruction set many orders of magnitude larger than previous combinatorial chemical libraries and a large pool of chemical manipulations compatible with the process, Harbury's "DNA Display" technique promises vast increases in the speed, efficiency, and search space for the use of combinatorial chemistry in the development of new drugs.

Pehr Harbury received a B.A. (1987) and a Ph.D. (1994) from Harvard University. He was a postdoctoral fellow (1995-97) at the University of California, Berkeley, and is currently an associate professor in the Department of Biochemistry at Stanford University, where he has been on the faculty since 1997. His publications have appeared in such academic journals as *PLoS Biology*, *Nature*, *Science*, and *Proceedings of the National Academy of Sciences USA*.

Nicole King

Molecular Biologist

Assistant Professor of Molecular and Cell Biology

University of California / Berkeley

Berkeley, California

Age: 35

Nicole King is a biologist who is reconstructing a critical event in the evolution of life – the emergence of multicellular organisms that form the base of the animal (metazoan) kingdom. Although the unicellular progenitors of animals are long gone, King has focused on organisms known as choanoflagellates, a putative outgroup in the early history of metazoan development. Choanoflagellates are unicellular organisms that share some morphological features with animal cells; some species also form colonies. Using molecular genetic techniques, King isolated from choanoflagellates two types of genes: adhesion molecules and receptor tyrosine kinases. These genes are critical for maintaining the physical integrity of tissues and for intercellular communication, respectively; they were previously believed to exist only in animals. Furthermore, she demonstrated that pharmacological inhibition of receptor tyrosine kinase activity reduces the rate of cell division in choanoflagellates, indicating a functional homology of these genes with their orthologs in animals. With these results, King has shown that the genes necessary for multicellular organization predate the emergence of the metazoan kingdom. She argues that demonstrating the existence of genes does not, however, imply that they are working in a coordinated fashion. In her future research, King plans to use whole organism sequence data to compare the functional genomic organization of choanoflagellates with early metazoans such as the sponge family.

Nicole King received a B.S. (1992) from Indiana University, Bloomington, and an A.M. (1996) and a Ph.D. (1999) from Harvard University. King held a postdoctoral fellowship (2000-2003) at the University of Wisconsin. Since 2003, she has been an assistant professor of genetics and development in the Departments of Molecular and Cell Biology and Integrative Biology at the University of California, Berkeley. She is also a faculty affiliate of the UC Berkeley Center for Integrative Genomics. Her research has appeared in such academic journals as *Nature*, *Science*, and *Developmental Cell*.

Jon Kleinberg

Computer Scientist

Professor of Computer Science

Cornell University

Ithaca, New York

Age: 33

Jon Kleinberg is a computer scientist with a reputation for tackling important, practical problems and, in the process, deriving deep mathematical insights. His research spans diverse topics ranging from computer networking analysis and routing, to data mining, to comparative genomics and protein structure. He is best known for his contributions to two aspects of network theory: "small worlds" and searching the World Wide Web. Since the original demonstration by Milgram, it has become widely understood that any two people are linked by a relatively small number of connections among mutual acquaintances ("six degrees of separation"). Kleinberg extended this concept by introducing the notion of navigability – essentially, the information structure of the network necessary for individuals efficiently to make distant connections based solely on local information. Surprisingly, he was able to prove that, while certain architectures can be computationally efficient, no algorithm can find the shortest path in networks with short, random connections. This demonstration has important implications both in sociology and in distributed network architecture design (e.g., peer-to-peer file sharing). In addition, Kleinberg has developed an algorithm for identifying the structure of web site interactions; his algorithm distinguishes "authority" sites, which contain definitive information, from "hub" sites, which refer to authority sites using hyperlinks. Beyond immediate application in the development of web search engines, this algorithm makes it possible to identify communities of interest on the web without explicit effort needed by members (even without awareness of the existence of the community).

Jon Kleinberg received an A.B. (1993) from Cornell University and an S.M. (1994) and a Ph.D. (1996) from the Massachusetts Institute of Technology. He has held research positions at IBM in the Theory and Computation Group (1995), the Computer Science Principles and Methodologies Group (1996-97), and, since 1998, continues to be a member of the Visiting Faculty Program at the IBM Almaden Research Center. He is a professor in the Department of Computer Science at Cornell University, where he has been on the faculty since 1996.

Jonathan Lethem

Novelist

Unaffiliated

Brooklyn, New York

Age: 41

Jonathan Lethem is the author of six novels, a novella, two short story collections, and a volume of essays that explore, in various ways, the relationship between so-called high art and popular culture.

Characterized by narrative leaps between vastly divergent genres, his fiction weaves the conventions of noir mysteries, westerns, science fiction, and comic books into coming-of-age tales that are otherwise evocative and realistic in content. In his most recent novel, *Fortress of Solitude* (2003), he depicts the intricate codes of childhood street life he navigated while growing up in the Boerum Hill section of Brooklyn during the 1970s, a time when the neighborhood was gentrifying and rife with race and class tensions. Demonstrating keen powers of observation and description, he embeds his readers deeply within the physical and social worlds his characters inhabit, in the schoolyards, on the stoops, and in the midst of the energetic dialogue and pop riffs that pulse throughout. While comic book motifs appear in *Fortress*, Lethem's earlier novel, *Motherless Brooklyn* (1999), takes the form of a detective story that is ceaselessly interrupted by the outbursts of its highly unconventional narrator, a Tourettes-plagued private investigator named Lionell Essrog. By orchestrating such allusions to popular genres within his fiction, Lethem heightens emotional engagement with his characters, blurs boundaries across a broad spectrum of cultural creations, and expands the frontier of American fiction.

Jonathan Lethem studied at Bennington College (1982-84) and immersed himself in the culture of literature by working as a bookseller at numerous bookshops in New York City and in Berkeley, California. His other novels include *Gun, with Occasional Music* (1994), *Amnesia Moon* (1995), *As She Climbed Across the Table* (1997), and *Girl in Landscape* (1998). He is also the author of the story collections, *The Wall of the Sky, the Wall of the Eye* (1996) and *Men and Cartoons* (2005), the novella, *This Shape We're In* (2001), and the essay collection, *The Disappointment Artist and Other Essays* (2005) and is editor of an anthology of stories, *The Vintage Book of Amnesia* (2000). His writings have appeared in numerous periodicals, including *The New Yorker*, *Rolling Stone*, and *McSweeney's*.

Michael Manga

Geophysicist

Associate Professor of Earth and Planetary Science

University of California / Berkeley

Berkeley, California

Age: 37

Michael Manga is a geophysicist who applies his background in fluid dynamics to a wide variety of fundamental questions in geology. The phenomena he explores range in scale from microscopic to planetary; he draws insights from field measurements, numerical simulations, laboratory experiments, and even astronomical observations. Manga began his research career by investigating the fluid dynamics of magma. He showed that the effects of bubbles or gas pockets in a liquid can alter shearing rates as a function of fluid viscosity, surface tension between liquid and gas, bubble size, and number of bubbles. He and colleagues subsequently showed how crystal and bubble orientations preserved in volcanic rocks reflect the straining forces imposed on subterranean magma. More recently, Manga has used surface water flux to explore the redistribution of stress through the Earth's crust following an earthquake. Somewhat surprisingly, tiny deformation in water-saturated rock due to distant earthquakes can trigger local earthquakes, changes in groundwater flow, or shifts in underground magma. These results offer the possibility of better identification of regional seismic hazards and forecasting of seismic activity. He does not limit his investigations strictly to terrestrial matters, however; other studies consider the fluid dynamics of planetary evolution, exploring volcanism on Mars and tidal pressures on the ice sheet of Jupiter's moon, Europa. In the laboratory, he uses tanks of corn syrup to model the geophysical properties of these astronomical bodies. Through his coordinated fieldwork, experimentation, and simulation, Manga has opened new avenues for understanding a wide and ever-growing range of geological phenomena.

Michael Manga received a B.S. (1990) from McGill University, and an S.M. (1992) and a Ph.D. (1994) from Harvard University. He was a Miller Research Fellow (1994-96) at the University of California, Berkeley and an assistant professor at the University of Oregon (1996-2001) before assuming his current position as an associate professor in the Department of Earth and Planetary Science at the University of California, Berkeley.

Todd Martinez

Theoretical Chemist

Professor of Chemistry

University of Illinois / Urbana-Champaign

Urbana, Illinois

Age: 37

Todd Martinez is a theoretical chemist who seeks to explain and predict complex chemical reactions based on the quantum mechanical properties of the atoms involved in the reaction. His work focuses on describing molecules at excited states, where conventional ground state electronic structure calculations are inadequate to capture the nature of their chemical reactivity. At subatomic scales, the electrons and nuclei do not behave like billiard balls, but rather are intrinsically statistical; when graphed, the probabilities representing possible states of a molecule can appear as familiar shapes. In a class of chemical reactions referred to as "nonadiabatic", graphs of potential energy surfaces form cones and these cones intersect. Martinez develops strategies and algorithms that predict the dynamic evolution of systems having conical intersections. He has created models for photoisomerization in several biochemically important molecules. Photoisomerization is a nonadiabatic process in which a photon triggers a molecule to change its conformation (but not its constituent atoms); among other things, it represents the biophysical basis for vision. By combining effective strategies for computing the quantum mechanical properties of complex molecules with a deep intuition for their underlying chemical behavior, Martinez is revealing fundamental insights into the physical basis for chemical reactions.

Todd Martinez received a B.S. (1989) from Calvin College in Grand Rapids, Michigan, and a Ph.D. (1994) from the University of California, Los Angeles. He was a Fulbright Fellow at the Fritz Haber Institute for Molecular Dynamics in Jerusalem and a University of California Presidential Postdoctoral Fellow at UCLA (1994-96). He joined the faculty of the University of Illinois, Urbana-Champaign in 1996, where he is a professor in the Department of Chemistry and a faculty affiliate in the Theoretical and Computational Biophysics group at the Beckman Institute for Advanced Science and Technology.

Julie Mehretu

Painter

Unaffiliated

New York, New York

Age: 34

Julie Mehretu is an artist who transforms her canvases into visually spectacular excavations of multiple epochs and locales. As a foundation and point of departure for her work, she depicts public spaces from around the globe – museums, stadiums, and international airports – in the form of heroically-scaled maps and architectural plans. On surfaces encased in coats of transparent resin, she paints over these sprawling drawings a maelstrom of colorful, geometric abstractions, iconic imagery, and loosely figurative markings that evoke a world of associations. Certain sketch marks suggest explosions, while others call to mind the curved backs of pilgrims praying at Mecca, or landscapes flecked with grassy plains. In one work entitled *Transcending: The New International* (2003), she renders in India ink the buildings and urban plans from all the capital cities of Africa onto one stratified topography; she includes designs from various eras and overlays these diagrams with a tumult of lines tracing the migrations and battlefronts that have crisscrossed this vast terrain. By layering multiple pictorial planes, she creates the illusion of movement, of elements advancing and receding at dizzying speeds within graphically stunning, timeless space. In so doing, Mehretu creates abstract paintings that grant viewers a dazzling glimpse of history's vicissitudes.

Julie Mehretu studied at the University Cheikh Anta Diop, Dakar, Senegal (1990-91) and received a B.A. (1992) from Kalamazoo College in Kalamazoo, Michigan, and an M.F.A. (1997) from the Rhode Island School of Design. She was an artist-in-residence at the Museum of Fine Arts in Houston (1998-99), the Studio Museum in Harlem (2001), and the Walker Art Center, Minneapolis (2002). Her works have appeared in numerous solo and group exhibitions at such venues as the Whitney Museum of American Art, the Carnegie Museum of Art, the Museum of Modern Art, New York, and the Contemporary Arts Museum, Houston. Mehretu lives and works in New York City.

Kevin M. Murphy

Economist

George J. Stigler Distinguished Service Professor

University of Chicago / Graduate School of Business

Chicago, Illinois

Age: 47

Kevin M. Murphy is a wide-ranging economist with an aptitude for applying careful empirical analyses within rigorous theoretical frameworks to economic questions of immense social import. Early in his career, Murphy identified how trends in wage inequality reflect underlying changes in demand for labor. These studies not only considered such variables as work experience, education, race, and gender, but also highlighted the importance of within-group wage variability in understanding labor economics. Murphy also considered the phenomenon of addiction from an economic perspective. Contrary to widely-held beliefs that addiction distorts economic judgment, Murphy and colleagues developed a model of "rational addiction", in which consumers anticipate the expected future consequences of their current actions; he developed empirical analyses supporting this model from data on cigarette consumption. Using his model in conjunction with a structural analysis of the industry, Murphy explained the counterintuitive observation of increasing profits for cigarette manufacturers despite decreasing demand for their products. More recently, he has shown that, particularly for conditions such as heart disease and cancer, investment in basic health research and care results in orders of magnitude returns in economic value. In these areas, and many others, Murphy challenges preconceived notions and attacks seemingly intractable economic questions, placing them on a sound empirical and theoretical footing.

Kevin Murphy received an A.B. (1981) from the University of California, Los Angeles and a Ph.D. (1986) from the University of Chicago. He is the author of numerous articles, appearing in such publications as the *Journal of Law and Economics*, *Journal of Political Economy*, and *American Economic Review*. He is also the co-author of *Social Economics: Market Behavior in a Social Environment* (2000) and co-editor of *Measuring the Gains from Medical Research: An Economic Approach* (2003). He has been on the faculty at the University of Chicago since 1986, where he is the George J. Stigler Distinguished Service Professor of Economics in the Department of Economics and Graduate School of Business.

Olufunmilayo Olopade

Clinician / Researcher

Professor of Medicine and Human Genetics

University of Chicago Hospitals

Chicago, Illinois

Age: 48

Olufunmilayo Olopade is an oncologist who translates her basic research on individual and population cancer susceptibility into an effective clinical practice for treating breast cancer among African and African-American women. Trained in clinical oncology and cancer genetics, her early research led to the identification of a tumor suppressor locus on the short arm of the 9th chromosome. Her more recent work focuses more specifically on the molecular genetics of breast cancer in women of African heritage. Tumors of this population demonstrate distinct biological characteristics, including a high level of aggressiveness and resistance to treatment. Olopade first described recurrent BRCA1 mutations in extended African-American families with breast cancer, and reported BRCA1 and BRCA2 mutations in pre-menopausal breast cancer patients from West Africa. As founding director of the Center for Clinical Cancer Genetics at the University of Chicago, Olopade leads the application of her research from the bench to the bedside. She oversees a coordinated, multidisciplinary, clinical program that includes oncologists, primary care physicians, genetic counselors, sociologists, and psychologists and provides free access to genetic services for local, at-risk populations. Currently, Olopade also heads a West African clinical trial for a pill form of chemotherapy as treatment for women with advanced breast cancer. In bridging continents with her innovative research and service models, Olopade is increasing the probability of improved outcomes for millions of women of African heritage at risk for cancer here and abroad.

Olufunmilayo Olopade received an M.D. (1980) from the University of Ibadan, Nigeria, and served as a medical officer at the Nigerian Navy Hospital. She completed an internship and residency (1986) at the Cook County Hospital, Chicago, and trained in hematology and oncology as a postdoctoral fellow (1987-1991) at the University of Chicago. Olopade is a professor of medicine and human genetics and director of the Center for Clinical Cancer Genetics at the University of Chicago Medical Center, where she has been on the faculty since 1991.

Fazal Sheikh

Photographer

Unaffiliated

Zurich, Switzerland

Age: 40

Fazal Sheikh is a documentary photographer who uses the personalizing power of portraiture to bring the faces of the world's displaced people into focus. His subjects have included Sudanese and Somali refugees at camps in Kenya, survivors of the Soviet occupation of Afghanistan, the indigenous people of Pantanal, Brazil, and immigrants crossing, then recrossing, the border between Mexico and the United States. In contrast to sensational, mass-media depictions of humanitarian crises, he takes formal portraits of his subjects – living among them and earning their collaboration. With names printed prominently next to their images, mothers, children, wounded soldiers, and tribal elders assume stately poses, hold pictures of loved ones, and gaze directly at Sheikh's camera, producing understated studies of human dignity under devastating circumstances. Relying on the clarity of black-and-white, naturally lit images, he presents these striking photographs with accompanying texts that describe, in the words of his subjects, the personal histories and circumstances leading to the conditions he records. In addition to completing four books of photography and participating in numerous exhibitions, Sheikh disseminates his work on DVD and via free website to reach the widest international audience possible. With his solemn and arresting works of art, Sheikh slows the act of viewing, calls attention to the persistent nature of conflict, and highlights the importance of bearing witness.

Fazal Sheikh received a B.A. (1987) from Princeton University. Through a photography project he undertook in Kenya as part of a 1992 Fulbright Fellowship in the Arts, Sheikh began his commitment to documenting the lives of refugees. He is the author of four published volumes, *A Sense of Common Ground* (1996), *The Victor Weeps* (1998), *A Camel for the Son* (2001), *Ramadan Moon* (2001), and *Moksha* (2005); the latter three books are part of a continuing series on international human rights. His work has been exhibited in solo and group exhibitions at such venues as the Corcoran Gallery of Art, the Art Institute of Chicago, the Seattle Art Museum, and the International Center of Photography, New York. He lives in Zurich, Switzerland, and in New York City.

Emily Thompson

Aural Historian

Associate Professor of History

University of California / San Diego

San Diego, California

Age: 43

Emily Thompson is an interdisciplinary scholar whose work focuses on the often-overlooked subject of sound and fills an important gap in contemporary American history, reaching into domains as diverse as urban design and cinema studies. In her book, *The Soundscape of Modernity*, she integrates the histories of the United States, technology, science, sound production, and acoustics to examine the transformation of the American soundscape from the turn of the century to the opening of Radio City Music Hall in 1933. Thompson organizes her work around developments in twentieth-century architecture, such as new concert halls and new building materials, and explores innovations in the science of acoustics, the emergence of excessive noise, and the efforts of scientists and designers to create new spaces and a new, “modern” sound. Her interests center around changes in acoustic design as reflections of larger cultural and social shifts in American life in the early 1900’s; she documents the interplay between differences in acoustic characteristics of buildings constructed during this period and increases in the value placed at the time on technological mastery, efficiency and control in modern life. Thompson’s most recent project, on the role of engineers, projectionists, and other industry technicians in the transition to synchronized sound in cinema, promises to provide a similarly penetrating analysis of another important moment in the history of sound and technology. By charting the transformation of the elusive and ephemeral phenomenon of sound, Thompson has recovered an important history of our time.

Emily Thompson received a B.S. (1984) from the Rochester Institute of Technology and a Ph.D. (1992) from Princeton University. She has held teaching positions at Rensselaer Polytechnic Institute (1992-93), Iowa State University (1994-95), and the University of Pennsylvania (1995-2002). Thompson was also a visiting scholar (2003-04) in the Program in Science, Technology and Society and a senior fellow (2002-03) at the Dibner Institute for History of Science and Technology, both at the Massachusetts Institute of Technology. She became an associate professor in the Department of History at the University of California, San Diego, in 2005.

Michael Walsh

Vehicle Emissions Specialist

Technical Consultant

Unaffiliated

Arlington, Virginia

Age: 62

Michael Walsh is an independent engineer and policy analyst committed to improving regional public health and the global environment by reducing the impact of internal combustion engines on air quality. Beginning in the 1980's with his work shaping legislation that significantly reduced lead emissions in the United States, Walsh has developed a reputation for finding effective and practical solutions to thorny public policy problems. His bimonthly publication, *Car Lines*, is widely recognized by governments, manufacturers, and research institutions as a vital resource for information regarding technical advances in emissions control and trends in regulatory policies. Because of his encyclopedic knowledge of international standards, engineering policy, and air pollutant chemistry, government agencies throughout the world turn to him to help tailor policies to protect air quality that accommodate local priorities and economic conditions. In Central America and Asia, Walsh has demonstrated how leapfrogging emissions standards of the most industrialized economies positions other economies to become centers of advanced technology. Recently, he has turned his attention to reducing sulfur emissions from diesel engines, helping to design fuel standards in the U.S. and elsewhere. With projections of over 1 billion vehicles on the roads worldwide by the year 2025, the problem of protecting health and air quality looms large. By virtue of his indefatigable commitment, soft-spoken persuasion, and unrivaled expertise, Walsh continues to play an important and strategic role in translating science into effective policy action.

Michael Walsh received a B.S. (1966) from Manhattan College and pursued graduate study at Princeton University (1969-70). Early in his career, he worked in government service, directing motor vehicle pollution control efforts in the City of New York Department of Air Resources (1970-74) and the U.S. Environmental Protection Agency (1974-81). Since 1981, Walsh has been an independent technical consultant advising governments and industries worldwide on vehicle emission standards. Among his many clients are the American Lung Association, the Organization for Economic Cooperation and Development (OECD), the United Nations Environment Program, and the Environmental Protection Agencies of Brazil, Mexico, Switzerland, Thailand, and China.

###END - MacArthur Fellows 2005 Biographies