The 8th Mississippi State – UAB Conference on
Differential Equations and Computational Simulations

Short Biographies of Invited Principal Speakers

May 7 – 9, 2009
Mississippi State University

Douglas N. Arnold

Dr. Douglas N. Arnold is the McKnight Presidential Professor of Mathematics at the University of Minnesota. He received his PhD in Mathematics from the University of Chicago in 1979. From 1979 through 1989 he was on the faculty of the University of Maryland. In 1989 he moved to Penn State University where he was appointed Distinguished Professor of Mathematics and served as co-director of the Center for Computational Mathematics and Applications and as associate director of the Institute for High Performance Computing Applications. He moved to University of Minnesota in 2001 and served as Director of the Institute for Mathematics and its Applications from 2001 - 2008. Under his leadership the Institute grew to be the largest mathematics research investment in the history of the National Science Foundation. For 2009 and 2010, Dr. Arnold serves as the President of SIAM. Dr. Arnold's research interests include numerical analysis, partial differential equations, mechanics, and in particular, the interplay between these fields. He has written about 80 papers, serves on the editorial boards of numerous journals, and has been designated as a Highly Cited Author by Thomson ISI. His accomplishments have been recognized by many awards and honors, including the first International Giovanni Sacchi Landriani Prize by the Lombardy Institute Academy of Arts and Letters in 1991 and a Guggenheim Fellowship in 2008. He has delivered plenary lectures at the International Congress of Mathematicians (Beijing 2002) and the Joint Mathematics Meetings (Washington, DC, 2009). He also serves or has served on a variety of advisory and scientific boards, and coauthored an award winning video, Möbius Transformations Revealed, which became a runaway hit on YouTube with over 1.5 million views.

Peter W. Bates

Dr. Peter Bates was born in Manchester, England, and obtained his BSc in Mathematics from Queen Mary College, University of London. He moved to the US and obtained his PhD in mathematics from the University of Utah. His academic appointments include Assistant Professor at Pan American University and then Texas A & M University, Associate Professor at Texas A & M and then Brigham Young University, followed by Professor at Brigham Young University and then Michigan State University. He served as Department Chair at the last two institutions. He also held visiting positions at Heriot-Watt University in Scotland, the University of Texas at Austin, the University of Utah, the University of Cambridge, Kyoto University, the University of Minnesota, and the University of Auckland. He also spent two years as Program Director for Applied Mathematics at the National Science Foundation. He has served on the editorial board of numerous journals, including Memoirs and Transactions of the AMS and served on committees for SIAM and the AMS. He now serves on the Board of Governors for the Institute for Mathematics and its Applications. His areas of expertise include nonlinear partial differential equations, the theory of infinite-dimensional dynamical systems, random dynamical systems, materials science, and mathematical biology.

John A. Benek

Dr. Benek received his PhD from the University of Tennessee. He has extensive technical management experience, and a broad range of experimental and computational experience covering the range of flow phenomena, from rarefied to continuum across the subsonic to hypersonic speed regimes. He has led both basic and applied research efforts in these areas. In addition, he is a pioneer in combining experimental and high-fidelity physics simulations to reduce system development risk and cost. To further this concept, he has established a network of close ties with NASA, Army, Navy and Department of Energy organizations. Dr. Benek has served on numerous strategic planning groups with the test and evaluation community. Currently, he is a member of the scientific and professional cadre of senior executives and a Senior Scientist in Computational Fluid Dynamics at the Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. He provides leadership and strategic vision for the center's research and development programs in high-fidelity, physics-based modeling of fluid flows and fluid-coupled multidisciplinary phenomena. In addition, he advises the Air Force on fluid-flow simulation capability.

Alfonso Castro

Dr. Alfonso Castro is a native of Bogota, Colombia. He got his undergraduate and MS degrees from the National University of Colombia and his PhD degree from the University of Cincinnati under the supervision of Professor Alan Lazer. He has served on the faculty at the Centro de Investigacion del I. P. N. (Mexico), Texas State University, University of North Texas, University of Texas at San Antonio, and is currently the Jonsson Professor of Mathematics at Harvey Mudd College. He also directed the NSF programs on Classical Analysis and Applied Mathematics. His research includes critical point theory, inverse function theorems, semipositone problems, and nonsymmetric solutions to symmetric problems and semilinear wave equations. He has had eleven doctoral students and more than twenty coauthors. He was one of the founding editors of the highly successful Electronic Journal of Differential Equations. He and Professor Shivaji coined the term "semipositone problem" and their joint work pioneered the research in this area.

Pavel Drábek

Dr. Pavel Drábek is a Professor of Mathematics at the University of West Bohemia in Pilsen, Czech Republic. He has been the Head of the Department of Mathematics in the Faculty of Applied Sciences since 1990. He graduated from Charles University (Prague) in 1977 and obtained his PhD in 1981 from the Czechoslovak Academy of Sciences. He worked as an assistant professor and then as an associate professor at the University of Electrical and Mechanical Engineering in Pilsen from 1978 to 1991. In 1990 he was awarded DSc by the Czechoslovak Academy of Sciences in Prague and then appointed in the same year as a Full Professor at the University of West Bohemia in Pilsen by Václav Havel, the President of the

Czech and Slovak Federative Republic. After the crash of the Iron Curtain in Europe in 1989, Dr. Pavel Drábek had visited many research institutions in Europe, USA, Canada, Australia, Japan and South America. With more than 60 mathematicians from different countries all over the world he coauthored over 130 research papers and 7 books. He also serves on the editorial boards of several international mathematical journals and edited a series called Handbook on Differential Equations by Elsevier (2004 – 2006). His current interests include boundary value problems for quasilinear ordinary and partial differential equations in which the so called p-Laplacian differential operator serves as a prototype. In 2003 he was elected a Fellow of the Learned Society of the Czech Republic.

Gisèle Ruiz Goldstein

Dr. Gisèle Ruiz Goldstein received her Ph.D. in Mathematics from Tulane University in 1986. She became an assistant professor at Louisiana State University in the fall of 1986 and was later promoted to full professor there. In the fall of 1996 she moved to the University of Memphis. Her research interests include rigorous quantum mechanical electron ground state density theory (including variants of Thomas-Fermi theory), modern boundary conditions, nonlinear semigroups, and other topics in partial differential equations and the calculus of variations. She has co-directed five Ph.D. theses and has served on various committees for the American Mathematical Society, the Association for Women in Mathematics and the National Science Foundation. She is also an avid marathon runner and has completed more than thirty five marathons.

Philip Maini

Dr. Philip Maini received his BA in mathematics from Balliol College, Oxford, in 1982 and his DPhil in 1985 under the supervision of Prof J. D. Murray, FRS. Currently he is a Professor and Director of the CMB at Oxford. He is on the editorial boards of a large number of journals, including serving as the managing editor for the Bulletin of Mathematical Biology. He has also been an elected member of the Boards of the Society for Mathematical Biology (SMB) and European Society for Mathematical and Theoretical Biology (ESMBTB). Recently he was elected to the Council of the IMA. His research projects include the modelling of avascular and vascular tumours, normal and abnormal wound healing, collective motion of social insects, bacterial chemotaxis, rainforest dynamics, pathogen infections, immunology, vertebrate limb development, and calcium signalling in embryogenesis. He has over 230 publications in the field and has held visiting positions at various universities around the world. He was awarded a Royal Society Leverhulme Trust Senior Research Fellowship for 2001 - 2002 and a Royal Society-Wolfson Research Merit Award for 2006 - 2011. In 2005 he was elected Honorary Guest Professor, University of Electronic Science Science and Technology of China, Chengdu, and in 2006 appointed to a 3-year Adjunct Chair at the School of Mathematical Sciences, Queensland University of Technology, Brisbane.

Scott Morton

Dr. Scott A. Morton is the Principal Software Developer for the Kestrel Fixed Wing Aircraft Product of the Computational Research and Engineering Acquisition Tools and Environments (CREATE) Program, part of the Department of Defense High Performance Computing Modernization Program Office. He leads a team of six aerodynamicists, structural dynamicists, and software engineers in a twelve year project to produce a production quality tool integrating aerodynamics, dynamic stability and control, structures, propulsion, and store and cargo separation into a single simulation on a petaflop class machine. He received his BS from Parks College of St. Louis University in 1985, and his MS and PhD from the Air Force Institute of Technology in 1989 and 1996, respectively. During his 20-year Air Force military career he served at the National Air Intelligence Center, Air Force Flight Test Center, Air Force Research Lab, Air Vehicles Directorate, and the Air force Academy. He was a Professor of Aeronautics at the Air Force Academy from 1998 to 2006, at which time he retired from the Air Force at the rank of Lt. Colonel.

J. Tinsley Oden

Dr. J. Tinsley Oden is Associate Vice President for Research at the University of Texas at Austin. He is also the Director of the Institute for Computational Engineering and Sciences (ICES), which is an organized research center devoted to interdisciplinary research in broad areas of computational sciences. Dr. Oden holds the Cockrell Family Regents' Chair in Engineering and the Peter O'Donnell, Jr. Centennial Chair in Computer Systems. He is a Professor of Aerospace Engineering and Engineering Mechanics and a Professor of Mathematics. Dr. Oden has worked extensively on the mathematical theory and implementation of numerical methods applied to problems in mechanics and physics, and is the author of over 500 scientific publications, including being the author or editor of 50 books. He is a member of the U.S. National Academy of Engineering, the American Academy of Arts and Sciences, and many other professional and scientific organizations. He is a past President of the Academy of Medicine, Engineering, and Science of Texas and serves on many national advisory boards.

Stanley Osher

Dr. Stanley Osher is a Professor of Mathematics at the University of California, Los Angeles and the Director of Special Projects, Institute for Pure and Applied Mathematics. He got his postgraduate education at the Courant Institute, New York University and spent three decades at UCLA. He was elected as a member of National Academy of Sciences, USA, in 2005. His research interests include level set methods for computing moving fronts involving topological changes, the development of methods for approximating hyperbolic conservation laws and Hamilton-Jacobi equations, total variation and partial differential equation-based image processing techniques, scientific computing and applied partial

differential equations and optimization arising in information and image science, especially problems related to sparse representation.

Peter Polacik

Dr. Peter Polacik received his PhD from Comenius University in Bratislava, Slovakia, in 1989. He has held faculty positions at the Institute of Applied Mathematics of Comenius University and the University of Minnesota (current), and visiting professor positions at the University of Zurich, Brigham Young University, and Georgia Tech. He has authored or coauthored over 70 research papers mostly dealing with qualitative properties of solutions of partial differential equations and infinite-dimensional dynamical systems. He is currently focusing his research on parabolic partial differential solutions examining regular solutions as well as solutions with singularities. Dr. Polacik has been an editor of several mathematical journals, including Acta Mathematica Universitatis Comenianae, Discrete and Continuous Dynamical Systems, Journal of Dynamics and Differential Equations, Transactions of the American Mathematical Society, and Memoirs of the American Mathematical Society.

Jere P. Segrest

Dr. Jere Segrest is Professor of Medicine, Biochemistry & Molecular Genetics, Pathology, Biomedical Engineering and Adjunct Professor of Chemistry at the University of Alabama in Birmingham (UAB). He received his MD and PhD in Biochemistry from Vanderbilt University School of Medicine. He has been the Director of the UAB Atherosclerosis Research Unit since 1983 and the UAB Center for Computational and Structural Dynamics since 2004. Dr. Segrest is past Director of UAB's Lipid Clinic located at the University of Alabama Health Service Foundation Kirklin Clinic. His research interests include the structure and function of HDL and LDL in pathophysiology of atherosclerosis, clinical detection, prevention and treatment of atherosclerosis, and protein-lipid interactions in membranes and plasma lipoproteins. Dr. Segrest is the author of approximately 200 peer-reviewed publications. He is the inventor of the advanced lipid testing procedure - the VAP and founder of the company Atherotech.

Theresa Windus

Dr. Theresa Windus received her PhD in Physical Chemistry from Iowa State University in 1993. She was a Postdoctoral Fellow at Northwestern University from 1994 to 1996 and Director of Computational Chemistry/Training at Ohio Supercomputer Center from 1996 to 1998. She joined the Pacific Northwest National Laboratory (PNNL) in March 1998 as a staff scientist with the Environmental Molecular Sciences Laboratory in the consulting group and became involved in the development and maintenance of the computational chemistry code, NWChem. With her extensive experience in parallelization of algorithms and in computational chemistry, she transitioned to the Molecular Science Software Group.

In July of 2002, she became the manager for that group. By April 2004, she was managing the Molecular Science Software Group (MSSG) and the Visualization and User Services (VisUS) group in the Molecular Science Computing Facility (MSCF) in the Environmental Molecular Sciences Laboratory of PNNL. Since 2006, she has been a Professor at Iowa State University and an associate with DOE's Ames Laboratory. Her current interests are design and development of efficient and novel massively parallel algorithms for computational chemistry, object oriented and component design, collaboratory problem solving environments, computations related to actinide chemistry, reaction mechanisms and kinetics, nucleation and growth of aerosol clusters, phosphate reactions in biological systems and nonadiabatic chemical dynamics.