

# Michigan Math and Science Scholars Faculty for 2009

## **Frederick Becchetti**

Fred is a Professor in the Department of Physics. He received his B.Sc., M.S. and Ph.D. at the University of Minnesota. His research focuses on nuclear reactions, nuclear astrophysics and medical physics. Fred is a recipient of the LS&A Excellence in Teaching Award and has recently served on the American Association of Physics Teachers-Undergraduate Teaching Committee. He often can be found judging science fairs, including the Southeast Michigan Science Fair and the International Science Fair. His hobbies include fishing, skiing and, of course, magic.

## **Mort Brown**

Mort is a (recently retired) Professor of Mathematics at the University of Michigan and Arthur F. Thurnau Professor in the College of Literature Science and Arts. He received his Ph.D. in mathematics from the University of Wisconsin. His fields of research are topology and dynamical systems. His most recent obsession is developing interesting mathematical games as a means of introducing students to some of the underlying concepts that flow across all advanced math. His fancy second title (above) is a teaching honor.

## **Bryden Cais**

Bryden Cais is a postdoctoral fellow at the Centre de recherches mathématiques in Montreal. He received his B.A. from Harvard and his Ph.D. from the University of Michigan. He is interested in the application of geometry and algebra to problems in number theory.

Bryden's love of math began with a high school summer math program much like MMSS, and he is very excited to be working with MMSS this summer! Outside of math, Bryden enjoys cycling, dancing, rock-climbing, and tinkering around with anything mechanical.

## **Zhan Chen**

Zhan is an Associate Professor in the Department of Chemistry of the University of Michigan. He received his PhD from the University of California at Berkeley, and did his postdoctoral research at the Lawrence Berkeley National Laboratory. The research in his group at the University of Michigan is focused on the molecular level characterizations of complicated surfaces and interfaces, such as polymer surfaces, polymer interfaces, and interfacial proteins using advanced analytical techniques. Such research provides in-depth understanding of molecular mechanisms of biocompatibility, biofouling, and polymer adhesion. Zhan received his National Science Foundation Career Award in 2004, and his Beckman Young Investigator Award in 2003. He was named as a Dow Corning Assistant/Associate Professor between 2003 and 2006. In his spare time, he enjoys reading, hiking, and traveling.

# Michigan Math and Science Scholars Faculty for 2009

## **Mark Conger**

Mark is a Lecturer and program developer in the Mathematics Department. He received his B.A. degree from Williams College and M.A. and Ph.D. from the University of Michigan. In between his B.A. and Ph.D. he spent many years working as a professional computer programmer, and did lots of programming for fun as well. His research interests are in enumerative combinatorics and probability, but he considers himself a mathematical generalist. His recent work has focused on the mathematics of card shuffling and dealing. For fun he does woodworking and computer hacking. The summer of 2008 will be his seventh summer teaching in MMSS.

## **William Currie**

Bill is an Assistant Professor in the School of Natural Resources & Environment at the University of Michigan. He holds a BS in Physics from Brown University, a MS in Environmental Sciences from the University of Virginia, and a Ph.D. in Natural Resources from the University of New Hampshire. Previously, Bill was a postdoctoral scholar at the Ecosystems Center at the Marine Biological Laboratory in Woods Hole, MA. His research and teaching at UM focus on the development and application of dynamic simulation models of ecosystems, specifically on how ecosystem organization translates into controls on system responses to aspects of global change. His research is collaborative, typically applying ecosystem models to interpret the results of large-scale field manipulations with other investigators. Current research, for example, includes a National Science Foundation funded project to understand carbon and nitrogen interactions that control enhanced production in loblolly pine forests in which entire stands of trees are being artificially exposed to doubled levels of atmospheric CO<sub>2</sub>. Learn more about his research and teaching at his website.

## **Glenn Fox**

Glenn is a Professor of Biology at Jackson Community College. He received his B.S., M.S., and Ph.D. in Biology from the University of Michigan, where he taught as a Graduate Student Instructor for four years. Glenn's research focuses on the evolution and ecology of squamate reptiles (specifically snake evolution and origins), and he has a special interest in the philosophy of science and the combination of technologically intensive and philosophically cogent approaches to testing hypotheses of historical relationships among organisms. This is Glenn's seventh year participating in the MMSS Program. In his spare time, he enjoys hiking, nature photography, travel, and developing means to acquire more spare time.

## **Louise Hecker**

Louise Hecker is a Postdoctoral Research Scientist for the Department of Internal Medicine at the University of Michigan. Louise holds a BA in Biology from Hartwick College, an MA in Ecology Evolution and Behavior from Binghamton University, and a Ph.D in Applied Physics from the University of Michigan. Louise has a diverse research background, having worked on research projects involving limb deformities in amphibians, pheromone communication in newts, and bioengineering functional cardiac tissue. Her current research is focused on investigating the effects of aging on lung repair

# Michigan Math and Science Scholars Faculty for 2009

responses in an effort to elucidate potential mechanisms of lung repair/regeneration. In her free time, Louise enjoys training for triathlons, traveling, and taking long walks in the arboretum with her dog.

## **Mel Hochster**

Mel Hochster is the Chair of the Department of Mathematics here at the University of Michigan, a Jack E. McLaughlin Distinguished University Professor of Mathematics, and is a member of the National Academy of Sciences and of the Michigan STRIDE Committee that is dealing with gender equity issues in the sciences. He did his undergraduate work at Harvard and received his Ph.D. from Princeton. His research interests might be described as studying solutions of a large number of equations in a large number of unknowns, including their geometry, by techniques related to number theory. He has five children, including one who is grown and is a mathematician, an eighteen year old, and twelve year old triplets. Somehow this does not leave a lot of time for recreation, but his hobbies include bridge and cryptic crossword puzzles.

## **Phillip Hughes**

Philip is a Research Scientist and Adjunct Professor in the Astronomy Department of the University of Michigan. He received his Ph.D. from the University of Sussex in the United Kingdom and did postdoctoral research at the Mullard Radio Astronomy Observatory of the Cavendish Laboratory, Cambridge, before coming to the University of Michigan in 1983. His research focuses on energetic flows in the form of plasma jets, traveling at almost the speed of light, from the environment of the supermassive black holes that inhabit the nuclei of active galaxies. These studies use simulations run on clusters of computers, modeling the plasma flow in a way similar to that used by aerospace engineers to model to air flow over a plane's wing. He enjoys photography and movies, and is obsessive about keeping up with international news and current affairs.

## **Trachette Jackson**

Trace' is an Associate Professor in the Department of Mathematics. She has a B.S. in Mathematics from Arizona State University and a Ph.D. in Applied Mathematics from the University of Washington. Trace's research interests involve developing models of tumor structure, growth, and chemotherapeutic control strategies. In addition to mentoring students on career opportunities in math and science, Trace' likes hiking, gardening and cooking.

## **Santhadevi Jeyabalan**

Santha is a lecturer in the Department of Molecular, Cellular and Developmental Biology (MCDB). She received her M.S. and Ph.D. from the University of Michigan, Ann Arbor in 1976, in Genetics and Developmental Biology. She also holds a M.S. in Microbiology from Eastern Michigan University and an M.Sc., in Parasitology from Madras University, India. She is devoted to full time teaching, coordinating the Genetics Lab and the Developmental Biology Lab for upper level undergraduates and teaching a Genetics course in Spring terms. She is a recipient of LS&A Excellence in Education award in 1992, 94 and 98. Her "cyber fly" project won a Computer World Smithsonian award in

# Michigan Math and Science Scholars Faculty for 2009

1999. She is also an academic advisor in LS&A Honors and received the Ruth M. Sinclair Memorial award for advising in 1997. Santha enjoys teaching, cooking, reading Tamil literature and spending time with her three grown-up daughters.

## **Mike Jones**

Michael A. Jones earned his B.S. degree from Santa Clara University and M.A. and Ph.D. in Mathematics from Northwestern University. After a 3-year position at the U.S. Military Academy at West Point and a 1-year visiting position at Loyola University in Chicago, he taught for 10 years at Montclair State University in New Jersey. In August 2008, he became an Associate Editor for Mathematical Reviews, a division of the American Mathematical Society. His research interests include the development and application of mathematics to analyze the social sciences, including economics, political science, psychology, and law. He is currently writing a book about mathematics and sports. This will be his first summer teaching in the MMSS program.

## **Nkem Khumbah**

Nkem is a mathematics lecturer with the Comprehensive Studies Program at the University of Michigan. He holds a BS in Mathematics from the University of the District of Columbia, a MS in mathematics from Virginia Polytechnic Institute and State University, and a Ph.D. in Information Technology from George Mason University. Prior to joining the faculty at the University of Michigan, Nkem was an Assistant Professor of Mathematics at North Georgia College and State University. He also held research fellowships at Institute for Pure and Applied Mathematics (UCLA) and the Mathematical Science Research Institute (UC Berkeley).

At the University of Michigan, he has three main professional interests: 1) teaching mathematics 2) working with high schools to deliver mathematics instruction that is aligned with college expectations, and 3) research on development and application of mathematical structures that facilitate the compression of massive data sets with minimal loss to the statistical structure of the data.

In addition to his interests in mathematics, science, society and international development, Nkem enjoys playing soccer and board games with his three boys.

## **Alexei Kolesnikov**

Alexei is an Assistant Professor at Towson University. After completing his undergraduate and master's degree at Novosibirsk State University in Russia, he received his Ph.D. from Carnegie Mellon University. Before joining the mathematics department at Towson, Alexei held a postdoctoral appointment in the Department of Mathematics at the University of Michigan.

Alexei's research area is model theory, a part of mathematical logic that looks for (and often finds) familiar mathematical structures inside abstractly defined objects. In his free time, Alexei enjoys playing ping-pong, especially with representation theorists.

# Michigan Math and Science Scholars Faculty for 2009

## **David C. Michener**

David Michener is the Assistant Curator at the UM Nichols Arboretum and Matthaei Botanical Gardens and an Adjunct Assistant Professor in the Program in the Environment and the School of Natural Resource & Environment. His undergraduate degree is in botany from the University of North Carolina at Chapel Hill, and his M.A. and Ph.D. degrees in botany are from the Claremont Graduate School in conjunction with work performed at the Rancho Santa Ana Botanic Garden. He spent six years on a NSF-funded postdoc at the Arnold Arboretum of Harvard University; he's been at the University of Michigan since then. David's professional career includes responsibility for the exotic to endemic living plant collections and related landscapes managed by the "Arb and Gardens" in and near Ann Arbor, although his work has taken him from Brazil to the Russian Far East. David is nationally active in professional societies and with granting agencies in the management of living collections as museum-like entities. His teaching and curatorial responsibilities include facilitating and engaging investigators with the research resources; a recent twist is being the junior author on a pharmaceutical article (David figured the phylogenetic depth to the argument); his own work is increasingly focused on digital mapping, records, and virtual access. David's outside interests include gardening, fishing with friends, and travel.

## **Patrick Nelson**

Patrick is an Assistant Professor in the Department of Mathematics and the Associate Director of the Michigan Math and Science Scholars Program. He earned his B.S. from Arizona State University, a M.S. and Ph.D. from the University of Washington - all in Applied Mathematics. Patrick's research areas are in non-linear dynamics, mathematical modeling, and mathematical biology including virology and parasitic infections. His hobbies include baseball, tennis, squash, fishing, hiking and climbing.

## **Georg Raithel**

Georg is an Associate Professor in the Department of Physics. Georg received his Ph.D. at the University of Munich. In his research, he employs laser-cooled rubidium atoms to study matter waves in optical lattices and in other atom trapping devices, and to investigate collision processes involving cold, very highly excited atoms (Rydberg atoms) and cold plasmas. In his spare time and vacations, Georg enjoys bicycling, skiing, camping and mountain hiking with his family.

## **Edward Rothman**

Ed is a Professor in the Department of Statistics and Director of the Center for Statistical Consultation and Research. He holds a B.Sc. degree in Mathematics from McGill University in Montreal, Canada, and a Ph.D. degree in Statistics from the Johns Hopkins University in Baltimore Maryland. Ed is a consultant with researchers throughout the University, a variety of corporations, and students. He assists people with the design of their study, the analysis, and the presentation of the results. He has been honored for his teaching of undergraduates.

# Michigan Math and Science Scholars Faculty for 2009

## **Sheila Schuller**

Sheila is an adjunct lecturer at Eastern Michigan University and an independent consultant for natural resource management and conservation organizations across the country. She received her B.A. from Swarthmore College and her M.S. and Ph.D. from the University of Michigan, where she has also served as assistant director of the Ecosystem Management Initiative in the School of Natural Resources and Environment, a lecturer in Ecology and Evolutionary Biology, and an adjunct instructional consultant for the Center for Research on Learning and Teaching. Sheila has conducted research in Michigan, the California Channel Islands, and Greece, and her publications range from research articles on the evolution of hummingbird-pollinated plants, to practical guidebooks for natural resource managers, to an animal behavior textbook for middle and high school students. She enjoys learning and teaching all aspects of ecology, especially outdoors, and most of all while picnicking in a prairie with her two-year-old daughter.

## **David Winn**

Dave is a Lecturer in the Department of Physics. He earned his Ph.D. in Physics from the University of Michigan at Ann Arbor for research into the properties of top quark decays. Dave is a passionate fan of the game of hockey and spends most of his free waking moments pursuing the sport. When Dave is not teaching or skating he can be found testing his knowledge of "applied physics" by riding one of the many beautiful (and challenging!) mountain bike trails in Southeast Michigan.

## **Administration**

### **Stephen DeBacker**

Stephen is the Director of the Michigan Math and Science Scholars and an Associate Professor in the Department of Mathematics. He did his undergraduate work at Santa Clara University and received his Ph.D. from The University of Chicago. Before joining the faculty at the University of Michigan, he had appointments at Harvard and The University of Chicago. He is interested in using geometry and analysis to answer certain questions which arise in number theory. He spends nearly every mathematical free moment with his family; but in his spare time, he fixes his house -- be sure to ask for amusing stories about this.

### **Patrick Nelson**

Patrick is the Assistant Director of the Michigan Math and Science Scholars Program and an Assistant Professor in the Department of Mathematics. He earned his B.S. from Arizona State University, a M.S. and Ph.D. from the University of Washington - all in Applied Mathematics. Patrick's research areas are in non-linear dynamics, mathematical modeling, and mathematical biology including virology and parasitic infections. His hobbies include baseball, tennis, squash, fishing, hiking and climbing.