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The Newsletter of the Statistical and Applied Mathematical Sciences Institute

Blackwell-Tapia Conference

David Blackwell and Richard Tapia have spent a good portion of their prestigious careers inspiring a generation of African-American, Native American and Latino/Latina students to pursue careers in mathematics. This past November, SAMSI hosted the bi-annual Blackwell-Tapia conference. Nearly 100 people from around the country attended the two-day event which was held at the Radisson-RTP.

One of the highlights of the conference was bestowing the 2008 Blackwell-Tapia Award. This year's recipient was Juan Meza, department head and senior scientist for the High Performance Computing Research Department at Lawrence Berkeley National Laboratory.

Dr. Meza has an exceptionally distinguished record as a mathematical scientist. He is conducting cutting-edge explorations in the computational sciences, computational mathematics, and future technologies. Meza is noted to be a role model and active advocate for others from groups under-represented in the mathematical sciences.

Meza's research focuses on nonlinear optimization with an emphasis on methods for parallel computing. He also worked on various scientific and engineering applications including scalable methods for nanoscience, power grid reliability, molecular conformation problems, optimal design of chemical vapor deposition furnaces, and semiconductor device modeling.

His record of service to communities under-represented in mathematics includes chairing the Mathematical Sciences Research Institute (MSRI) Human Resources Advisory Committee, co-chairing the annual Diversity Day workshops of the Society for Industrial and Applied Mathematics, and many other activities too numerous to mention here; however, they regularly extend from serving on high-level advisory committees on diversity for major scientific organizations, through rolling up his own sleeves and working directly with early-career mathematics students from under-represented groups, as he did in the 2007 MSRI Undergraduate Program (MSRI-UP).

(Left-Right) is Robert Bryant (MSRI), Anthony Simms (Meyerhoff Scholar), Juan Meza (Lawrence Berkeley National Laboratory), Joshua Austin (Univ. of Maryland).

Juan Meza, 2008 Blackwell-Tapia award recipient, and Richard Tapia

Left to Right: Carlos Castillo-Chavez (Arizona State Univ.), William Massey - 2006 recipient (Princeton University), Juan Meza - 2008 recipient (Lawrence Berkeley National Laboratory), Arlie Petters - 2002 recipient (Duke University), Bob Megginson (University of Michigan), Rodrigo Banuelos - 2004 recipient (Purdue University), Richard Tapia (Rice University)

From the director…

Transitions – We have completed the major transition of the year, having moved into the new wing of the NISS/SAMSI building last November. This 11,782 square-foot addition more than doubles SAMSI's office space and features excellent rooms for meetings and working groups. It's a wonderful facility (thanks Alan Karr and NISS!), and we hope you will have a chance to see it in the near future.

A sad/happy transition occurred on the Directorate. Ralph Smith, who has had an enormous impact on SAMSI during most of its existence and through a variety of roles, stepped down as Associate Director. While sad to see Ralph leave, we were delighted to welcome his replacement, Pierre Gremaud, who has also been an outstanding leader.

As we transition from winter into spring, our efforts at SAMSI also transition from a primary focus on current year programs to a primary focus on planning for next year. Of course, our current programs – Algebraic Methods in Systems Biology and Statistics and Sequential Monte Carlo Methods – are still going strong and will remain highly active through the summer, but those programs are now primarily in the hands of the researchers themselves.

For next year, we are in the exciting phase of finalizing visitors and the many events that will provide focal points of the program research. As an indicator of the magnitude of the transition between programs, next year there will be 10-15 new postdoctoral fellows or postdoctoral associates, 9 new full-year visitors, 33 new semester-long visitors, and numerous other shorter-term visitors, all replacing the many postdocs and visiting researchers this year. This complete turnover of researchers is always the most stunning transition at SAMSI.

Attracting all this interest, of course, are the two wonderful research programs that we have for next year, Space-Time Analysis for Environmental Mapping, Epidemiology and Climate Change, which will kick off with a mid-September opening workshop, and Stochastic Dynamics, which will start at the beginning of September.

The final transition that I wanted to mention is the transition in directors at SAMSI. I will be stepping aside in the summer of 2010 (still a long ways off!), but a national search has already been launched to find the next director. Future newsletters will have lots more to say about this!

James O. Berger
Director

SAMSI Postdoc Profile: Ioanna Manolopoulou

Ioanna Manolopoulou always knew she wanted to do something related to mathematics. As a young girl growing up in Athens, Greece, she examined various career paths and decided that statistics was an interesting avenue to pursue.

"I think statistics has a fair amount of math, but it is relevant to everything. I like biological applications, so this was a good way for me to integrate statistics, mathematics and biology. There are many of genuinely interesting biological problems," says Ioanna.

Ioanna attended college at the University of Cambridge in the United Kingdom for her undergraduate and graduate degrees and heard about the 2008-09 SAMSI program on Sequential Monte Carlo (SMC) methods while completing her doctoral thesis. She decided to apply for a Postdoctoral Fellowship and is now working with Mike West, Duke University Professor of Statistics and Local Scientific Coordinator for the SMC Program. Ioanna participates in the Big Data and Distributed Computing working group which is lead by Professor West.

"There are two aspects to the big data and distributed computing area. The first is constructing efficient methods which will allow us to extract information from very large datasets which are typically hard to analyze. The second aspect is how to implement those methods, exploiting parallel computing power and minimizing computation time.
In many cases the datasets are large and the models complex, but the scientific questions are very specific, so how would we go about efficiently pinning down this information?" notes Ioanna.

One of the areas that Ioanna and her colleagues are working on is called rare event detection. If there is a large amount of data available, depending on what conclusions we want to draw, we want to focus on a sub-sample of the data which is relevant to the analysis of interest.

One specific problem the group is studying arises in flow cytometry. Flow cytometry is a technique through which one can take measurements from a fluid using fluorescence.
"In our case we have lots of data from human blood cells, and the objective is to identify and characterize rare cell subtypes using SMC," explains Ioanna. "We are looking through the data to identify which cells are of a specific, very rare subtype. There may be millions of cells, but only a few hundred of them having the rare type. Using SMC methods, one can sequentially identify those rare observations in order to draw inferences about them".

Ioanna will have one more year at Duke University after the SMC program is over. She plans to apply for jobs at the universities in the States.

samsi alumni: Do you have news you want to share? E-mail us at: alumni-news@samsi.info

Meet Pierre Gremaud, Associate Director

Pierre Gremaud joined SAMSI in 2008 as an associate director, representing North Carolina State University.

Gremaud was born and raised in Switzerland. He attended the University of Neuchatel, Switzerland, receiving a B.S. in Physics. He conducted his graduate work at the Swiss Federal Institute of Technology, Lausanne, Switzerland, receiving a Ph.D. in Mathematics. Gremaud was originally a theoretical physicist. "I switched to mathematics because it was more concrete," he noted.

From 1987-1991, Gremaud was a Research Assistant at the Swiss Federal Institute of Technology. He was a visiting/temporary Assistant Professor at the University of Minnesota from 1991-1994. Gremaud joined the faculty at North Carolina State University Department of Mathematics in 1994.

Gremaud's area of interest is mathematical and numerical analysis of continuum mechanics problems (fluids, nonlinear elasticity, plasticity, granular materials, medical applications). He is also interested in numerical methods for transport equations (hyperbolic conservation laws, Hamilton-Jacobi systems, mixed systems); and in free boundary problems (phase change problems).

When Gremaud is not a work, he likes to spend time sailing. He and his wife, Rory, and three children, (two boys and a girl) live in Apex, NC.

SAMSI welcomes back Michael Minion

Minion is an associate director of SAMSI. Minion spent the last semester in Berlin, Germany, as a Mercator Visiting Professor where he taught applied mathematics at the Free University.

Minion grew up near Chicago, in Lowell, Indiana. He attended Clemson University in South Carolina for his undergraduate degree, and went to the University of California – Berkeley for his graduate work. While at Berkeley, he spent his summers as a graduate researcher at Los Alamos National Laboratory in New Mexico. His postdoctoral work was at the Courant Institute, in New York City.

Minion came to The University of North Carolina at Chapel Hill in 1997. Minion's area of research is computational fluid dynamics (CFD).

In 2003, Minion and his wife (who is a UNC Professor who studies medieval German literature) both received Humboldt Fellowships from the Alexander von Humboldt Foundation and spent a year in Berlin. Part of the Humboldt experience is to build lasting relationships with researchers in Germany, so they returned to Berlin in 2005 and again in 2008.

Next year, Minion will be the Directorate Liaison for the Stochastic Dynamics program at SAMSI. "I am really excited about the Stochastic Dynamics program next year. There is going to be a great mix of researchers from statistics and applied math visiting SAMSI, which should produce a really dynamic research environment."

When Minion is not at UNC or SAMSI, he spends most of his time with his adorable twin daughters Isabella and Antonia.

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Calendar of Events for SAMSI

For more information about SAMSI programs and workshops, visit SAMSI's Web site at ***http://www.samsi.info***

Molecular Evolution and Phylogenetics,
2008-09 Program on Algebraic Methods in
Systems Biology and Statistics
April 2-3, 2009 at SAMSI

Adaptive Design, SMC and Computer Modeling Workshop,
2008-09 Program on Sequential Monte Carlo Methods
April 15-17, 2009 at SAMSI

Third Annual Graduate Student Probability Conference,
2008-09 Education and Outreach Program
May 1-3, 2009 at University of North Carolina
at Chapel Hill

Interdisciplinary Workshop for Undergraduate Students,
2008-09 Education and Outreach Program
May 18-22, 2009 at North Carolina State University

Transition Workshop, 2008-09 Program on
Algebraic Methods in Systems Biology and Statistics
June 18-20, 2009 at Radisson Hotel Research Triangle Park

Psychometrics Program, 2009 Summer Program
July 7-17, 2009 at Radisson Hotel Research
Triangle Park and SAMSI

Industrial Math/Stat Modeling Workshop for Graduate
Students, 2008-09 Education and Outreach Program
July 20-28, 2009 at North Carolina State University

(left to right) Nick Polson, University of Chicago Business School and Ernest Fokoue from Ohio State University at the Sequential Monte Carlo mid-program workshop, which was held Feb. 19-20.

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