

THE PACIFIC INSTITUTE FOR THE MATHEMATICAL SCIENCES

The University of Washington has become a member of the Pacific Institute for the Mathematical Sciences (PIMS). The participating departments are Applied Mathematics, Mathematics, and Statistics. The Institute is dedicated to:

1. Promoting innovation and excellence in research in all areas encompassed by the mathematical sciences,
2. Initiating collaborations and strengthening ties between the mathematical scientists in the academic community and those in the industrial, business and government sectors,
3. Training highly qualified personnel for academic and industrial employment and creating new opportunities for developing scientists,
4. Developing new technologies to support research, communication and training in the mathematical sciences.

As a member of PIMS the University of Washington hosted The Industrial Problem Solving Workshop (IPSW) during the period of June 11-15, 2001. The IPSW brings together graduate students and faculty from many universities to work on mathematical problems presented by industrial experts. It is based on the model of the Oxford Study Group, which has been run successfully at Oxford University for many years. The IPSW was organized primarily by Marc Paulhus (Calgary), Randy LeVeque (UW), Chris Bose (U. Victoria), and Hauxiong Huang (York). The week of the IPSW at UW was preceded by a week-long Graduate Modeling Camp at the University of Victoria, where 58 graduate students were mentored on problem solving and prepared for the IPSW. These 58 students were joined by about 40 other people who participated in the IPSW.

One of the problems presented to the Industrial Problem Solving Workshop came from Algorithmics, a financial mathematics firm. Alex Kreinin of that firm presented a problem on measuring the credit risk of a given portfolio, based on the credit ratings of the obligors. Standard Monte-Carlo techniques do not work very well since the interesting events (default by the obligors) are very rare and hence require a large number of simulations. Algorithmics came to the workshop with a very well thought-out model and everyone was pleasantly surprised that the group discovered an analytical solution based on using the Lindberg-Feller Theorem (basically the Central Limit Theorem in this context) to approximate the credit risk of all counterparties in a single (credit driver) scenario. This resulted in approximating the risk across scenarios by a mixture of Gaussians, the latter being one of the current methods for treating distributions with long tails. The group then proceeded to test this fast, approximate solution against much more time-consuming full Monte Carlo simulations for one time step. They found reasonable agreement and expect much better results for longer time horizons since the CLT is better suited when the number of independent random variables increases. This was viewed as a significant development in the important area of credit risk, one that we look for-

ward to seeing developed further.

On September 19, 2001, the Governments of Canada and Alberta joined the U.S. National Science Foundation to launch the Banff International Research Station (BIRS) for mathematical discovery and innovation. It will be housed in the Banff Centre and start operations in 2003. BIRS has an Executive Committee, composed of the Directors of PIMS and MSRI and the Scientific Director of BIRS. As a member of PIMS and MSRI the University of Washington is excited about the station's potential to become an international center of mathematical research excellence.

VISITORS

Each year the Department welcomes many visitors; these visitors, who come for varying periods of time, teach for us and participate in our seminars. They make significant contributions to the life of the Department. That our visitors come from all over the world attests to the international nature of our subject and to the Department's attractiveness as a center of mathematical work. This year for the first time we have visitors from some of the community colleges in the state; they come under the aegis of our new Community College Educators Sabbatical Program, which is described more fully in the article on our new calculus courses.

This year's list of visitors is somewhat longer than usual:

Dmitri Burago, Professor of Mathematics at Pennsylvania State University. Visiting Professor during Winter Quarter. (Geometry, asymptotic volumes of tori.)

Serkiy Ivashkovich, Professor of Mathematics, Université des Sciences et Technologies de Lille, France. Visiting Professor during Autumn and Winter Quarters. (Complex analysis, several complex variables.)

Vladimir Sharafutdinov, Head Researcher at the Sobolev Institute of Mathematics and Professor of Mathematics, Novosibirsk State University, Novosibirsk, Russia. Visiting Professor Winter Quarter. (Differential geometry and topology.)

Gleb Diatlov, Senior Researcher, Sobolev Institute of Mathematics, Novosibirsk, Russia. Visiting Assistant Professor Spring. (Inverse problems for partial differential equations.)

Hyeonbae Kang, Visiting Assistant Professor Winter and Spring Quarters. (Several complex variables, inverse problems.)

Dmitry Kozlov, Assistant Professor, University of Bern, Switzerland. Visiting Assistant Professor Winter Quarter. (Combinatorics, algebra, and topology.)

Youngmee Kwon, Associate Professor of Mathematics at the Hansung University, Seoul, Korea. Visiting Scholar. (Probability theory.)

Robert Pollack is a National Science Foundation Postdoctoral Fellow. He received his PhD from Harvard in 2001. (Number theory.)

Ana Granados is a visiting scholar from the University of Madrid, Spain. (Analysis.)

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