Determined to initiate a breakthrough in stochastic partial differential equations research, the department hosted the National Science Foundation/Conference Board for Mathematical Sciences Regional Conference in the Mathematical Sciences on August 9–13. IIT professors and conference organizers Jinqiao Duan, Igor Cialenco, and Fred J. Hickernell invited students and professionals from around the world to explore, comprehend, and offer insight on SPDEs.

"Stochastic partial differential equations are becoming increasingly important for modeling various complex phenomena," Hickernell says. "By hosting this conference we hope to spur greater research into the numerical solutions of SPDEs."

Through a series of 10 lectures, principal lecturer Peter E. Kloeden of the University of Frankfurt sought to instill an understanding of the key developments in the field of numerical SPDEs and subsequently launch an era of escalated findings. Additional talks related to complexity, moving boundary problems, and numerical implementation effectively complemented Kloeden’s lectures.

Participants were given many opportunities to contribute to the conference. During two breakout sessions which concentrated on current research topic developments and their importance to finding numerical solutions, participants introduced their own questions into discussion.

During one breakout session titled “Future Research Directions in Numerical Approximation of Stochastic Processes,” conference participants communicated their predictions for the future of SPDEs.

Participants were also able to contribute to the conference through participation in the poster session. Research from eight graduate students, faculty, and post-docs attracted both participants and local students.

In addition to listening to lectures, IIT Ph.D. candidate Xingye Kan decided to take full advantage of the opportunities that this conference had to offer by giving a tutorial talk entitled “Introduction to Numerical Simulations for Stochastic ODEs.”

"[This conference] brought a great opportunity for me to learn in the way that I can ask questions in person, while listening to [others’] presentations, talk and discuss with people with similar backgrounds [to mine], and therefore benefit for my own research."

Of 57 total conference participants, 34 were graduate students, one was a post-doc, nine were women, and four were minorities. Kan saw this diversity as vital to the success of the conference.

“People from different backgrounds bring their own understanding and insight so that others may benefit from obtaining motivation [for a] new area of research, looking at problems at a different angle,” Kan said.

Of course, every event has its difficulties. “When I was giving [my] talk, my laptop suddenly froze,” Kan said. “I was so embarrassed, but the audience just waited there peacefully and Prof. Cialenco came up to help me resolve the problem. I feel so grateful to the audience and Prof. Cialenco.”

With only minor hitches to speak of, the NSF/CBMS Regional Conference in the Mathematical Sciences can be deemed a success, and has many anxiously awaiting incredible SPDE research and results.
Qi Ye (AMAT Ph.D. candidate) has quite the resume—and he’s had a busy year to show for it. During the summer, he spent a week researching numerical solutions for operator eigenvalue problems at the University of Iowa at the invitation of Professor Ken Atkinson. He also gave an invited mini-symposium lecture at the Society for Industrial and Applied Mathematics (SIAM) annual meeting in Pittsburgh in July, presented at the Midwest Numerical Analysis Day in Ames, Iowa, and showed a poster at the Stochastic Partial Differential Equation workshop held at IIT Main Campus in August [see front page]. This past March, Ye also gave a talk at the 13th International Conference on Approximation Theory in San Antonio, Texas. According to his thesis advisor Professor Greg Fasshauer, Ye has done many impressive and mathematically diverse projects while in the department. We sat down with Ye for a short talk about what he is working on now and where he would like to end up after school.

**What is the main focus of your research? What are the applications or outcomes you can pull from it?**

I am working on using Green’s kernels in meshfree method approximations to find a new kernel-based method for the entire meshfree method. These methods help make approximations for PDEs and SPDEs in computational math. Engineers use meshfree methods for dynamical systems analysis, and computer scientists use them for machine learning.

**How did you get interested in that topic?**

This is a new field and it’s very young—about 20 years old. I attended the meshfree methods research seminar here on campus, and really liked it. So I decided to follow Fasshauer, and he’s now my thesis advisor.

**What kind of academic background do you have?**

I got a bachelor’s in math from China and then came here to IIT to study.

**Why math?**

Because all of the other fields are no good [laughs]. No, this is an interesting field, and I like the research.

**You’re going out and speaking at a lot of seminars and conferences lately. Are many people working on these topics and looking to you for answers?**

Not too many people are working on these topics—in the whole world there are, but overall not too many. Mostly the research is in Texas, California, Chicago, Germany at the Universities of Bonn and Gottingen, Hong Kong, and Australia. At conferences, we can get together and learn about new topics; and people are coming to me because I know the new research and stay up to date on what’s going on.

**How does that make you feel?**

[Laughs] I feel excellent about this. Traveling is helpful for my research—like when I went to Iowa City to work with Professor Ken Atkinson. With his help, I finished my paper, which prepared me to take my comprehensive exam.

**Do you have any other math projects going on at the moment?**

I have submitted two papers with Professor Fasshauer and am working on another one. They’re all in meshfree methods but cover different areas underneath them. One is on the theorems that are at the base levels of meshfree methods, and it is very important to understand them. Another is on meshfree method applications in PDEs and SPDEs. The first one will be in a journal, and the second is for a conference paper.

**This seems like a lot of different areas that must keep you pretty busy. What do you do outside of math?**

Yes, it seems like too many things to do and not a lot of time to do it. This research covers not only computational math but involves people analyzing random dynamical systems and other scientists. So it covers many fields that I need to understand. But to relax, I like to swim here on campus and bicycle around the lake and Chicago.

**When do you graduate, and what kind of position do you hope to find?**

Right now I am supposed to graduate in May 2012. So I will be looking for a post-doc position afterwards, and then hopefully become a professor at a university. It doesn’t matter where in the world, just a place that has the best projects to work on.
Where in the world is IIT Applied Math?

The faculty of the Department of Applied Mathematics have been hard at work, giving invited lectures and presentations around the world.

**Professor Plato Deliyannis**

*Faculty Member, 1962–2001*

Plato Deliyannis was a charismatic and brilliant mathematician, teacher, and mentor who brightened the lives of those lucky enough to have known him. The brilliance of his teaching was acknowledged by all, the breadth of his learning was astonishing (he was proficient in both pure and applied mathematics, having trained as an engineer in Greece before getting his Ph.D. in mathematics at the University of Chicago). The ability he had to solve hard problems quickly was breathtaking (not to say intimidating), and his skill in guiding me in my doctoral thesis was one of the highlights of my life. In addition, he was a wonderful companion with a wicked sense of humor, which he displayed in a manner not for the faint of heart; one of his best lines was, “Permit me to inform you that you are insane.” I remember him every time I use his taramosalata recipe, and when I do mathematics I often talk to him in my mind. He will remain a presence with me always. He was loved by everyone who knew him.

—By John Wenger (Ph.D. MATH ’79)

*Plato Deliyannis passed away in January 2010.*

**Professor Susan Sitton**

*Faculty Member, 1987–2010*

Susan Sitton (Ph.D. MATH ’76) passed away in August 2010. During her tenure at IIT, she served in several capacities, including assistant professor and associate chair of the Department of Mathematics, associate dean for undergraduate academic affairs, director of institutional research, and assistant provost for retention. She was most recently a senior lecturer of applied mathematics and the Reserve Officer Training Corps (ROTC) faculty liaison. She is remembered fondly by all who encountered her, and is survived by her husband, three children, and one grandchild.

In recognition of Sitton’s service to the university, and to honor her memory, a tree was planted on the IIT campus next to the Carr Chapel.

Professor **Fred Hickernell** gave invited talks at the Algorithms and Complexity for Continuous Problems Conference in Dagstuhl, Germany, in September 2009 and at MCQMC 2010 in Warsaw, Poland this past July.

Professor **Jinqiao Duan** spoke at the Programme for Stochastic Partial Differential Equations at the Newton Institute, Cambridge, UK, in March 2010, the European Geosciences Union Meeting in Vienna, Austria, in May 2010, and the Stochastic Dynamics Workshop in Bielefeld, Germany in November 2010.

Professor **Tomasz Bielecki** and Assistant Professor **Igor Cialenco** gave invited talks at the International Congress of the Bachelier Finance Society, June 22-26, Toronto, Canada.

Professor **Hemanshu Kaul** gave an invited talk at the 40th Joint Symposium on Combinatorics in Daegu, South Korea, in June 2010.

Associate Professor **Xiaofan Li** visited Shanghai University in July to present the results of his research grant.

**Professor Jinqiao Duan** spoke at the Programme for Stochastic Partial Differential Equations at the Newton Institute, Cambridge, UK, in March 2010, the European Geosciences Union Meeting in Vienna, Austria, in May 2010, and the Stochastic Dynamics Workshop in Bielefeld, Germany in November 2010.

Associate Professor **Michael Pelsmajer** is on a Fall sabbatical at the Special Semester on Discrete and Computational Geometry, in Lausanne, Switzerland.
Alumni News

Michael A. Cohen (MATH ’74) is principal of Cohen Strategic Consulting. He advises insurance companies on optimizing their ratings and relationships with the rating agencies, and assists companies with improving their performance by providing innovative solutions in the areas of strategic planning, enterprise risk management, mergers and acquisitions, business development, and competitive tactics.

William Robinson (MATH ’62), Crest Hill, Ill., has retired from Argonne National Laboratory after 39 years of service. While at Argonne as a scientific associate/engineering specialist, he was awarded the Reactor Engineering Pacesetter Award and the Materials Science and Technology Literary Award.

Mary Anne Smith (M.S. MT ’73, LAW ’77) is vice president and general counsel for Illinois Institute of Technology. In July, Smith was chosen by the Chicago Bar Association and Chicago Bar Foundation to receive the 2010 Exelon Outstanding Corporate Counsel Award, which is given annually to an attorney in a corporate position for outstanding pro bono and community service.

2010 and 2011 Menger Lectures

This past April, more than 110 people attended the Fourth Annual Karl Menger Lecture and Awards. Professor Donald Saari of the University of California, Irvine, gave the main lecture, titled “Arrow’s Theorem: What Does It Really Mean and How Does It Affect All Academic Disciplines?” The two-day event celebrates the life of Karl Menger and the accomplishments of the Department of Applied Mathematics at IIT with two days of lectures, presentations, and the sharing of experiences between alumni, friends, and current students of the department.

The Fifth Annual Karl Menger Lecture and Awards will be held April 4–5, 2011, on IIT’s Main Campus. The Karl Menger Lecturer will be Peter Winkler of Dartmouth College, on the topic of “Statistical Combinatorics.” For the latest information and reservations, please visit www.iit.edu/csl/am/about/menger.

Contact Us

Please send news of your professional or other achievements to:

Illinois Institute of Technology
Department of Applied Mathematics
Engineering 1 Building, Room 208
10 W. 32nd Street
Chicago, IL 60616

Phone: 312.567.8980
FAX: 312.567.3135
newsletter@math.iit.edu
www.iit.edu/csl/am/

Would you like email updates? Please email us at newsletter@math.iit.edu

Fred Hickernell
Department Chair
Gladys Collins
Department Coordinator
Joe Millham
Administrative Assistant and Newsletter