

# PUrview

DEPARTMENT OF MATHEMATICS • WEST LAFAYETTE, INDIANA • SUMMER 2009

## from the Head

Greetings from all of us at the Department of Mathematics. In this edition of our newsletter, you will read about the many exciting events that took place in the department during the last year and about some of the things we are doing to strengthen the department's tradition of excellence in teaching, research, and engagement. The newsletter also highlights faculty, student, staff, and alumni recognitions during the past year and provides a glimpse of what is coming ahead.

Despite the downturn in the economy and all the consequences such an event has for a public university like Purdue, we had an exciting and very busy year. In October, the department underwent an External Review. The External Review Committee consisted of seven world-renowned mathematicians from top mathematics departments around the country. Professor David Eisenbud of UC Berkeley chaired the committee. We were pleased that the committee had very high praise for the department's record of excellence in all aspects of its multiple mission.

But like all good review committees with a wealth of experiences and perspectives, the committee identified some areas in the department where improvements can be made. These include modifications in the graduate student Ph.D. qualifying exam system, a better plan for recruitment and retention of domestic graduate students, improvements in our advising system for undergraduate mathematics majors, the naming of our three-year visiting research assistant professors in the style of many of our peer departments, and further enhancing the visibility of our Center for Computational and Applied Mathematics (CCAM).

Perhaps the strongest recommendation the committee made is the need to reduce the teaching load for faculty, especially for our young and very productive faculty, to levels comparable to those of our peer institutions. In the committee's own words: "We fear the future may hold serious faculty recruitment and retention problems unless teaching loads are brought into line with the practice at the institutions with which Purdue competes for mathematics faculty." The committee expressed similar

concerns about the high teaching load for our graduate students compared to those of our peer institutions.

For the last several months, we have been hard at work to find creative and constructive ways to implement some of these recommendations. The teaching responsibilities of the department are enormous, and the entire teaching operation is very complex. Even small changes can have serious implications for our students. As we work to restructure some of our courses, we are being extremely careful to maintain, and improve, the high quality education our students are accustomed to receiving from the department. While the recent budget cuts have made some of the recommendations even more challenging, we continue to be optimistic that we can make real progress on several of these issues.

Our department has a superb, first-rate faculty who, in addition to being excellent teachers and mentors, are engaged in exciting research projects with collaborators from around the world. The addition of new faculty, postdocs, short-term visitors, as well as the many weekly seminars and colloquia, continually reinvigorates the rich research environment in the department.

In the previous issue of our newsletter, I wrote about our recent success in attracting several outstanding new tenured and tenure track faculty members. These new faculty began their appointments at Purdue in the fall of 2008. In this issue, you will read more about this impressive group of individuals. While we were forced to cancel our job searches for the 2008-09 academic year due to budget considerations, we were still able to make one deferred associate professor level appointment. Andrew Toms, an outstanding young mathematician working in the area of operator algebras, will join the department in the fall of 2010. We also made our first round of three-year appointments of the newly named Michael Golomb Assistant Professors, who are listed on page 10.

As always, we love to hear from our alumni and friends. Whether you are on campus or simply thinking back on your days at the Purdue Math Department, you are most welcome to come by and say hello or to drop us a line and let us know how you're doing. Either way, we'd love to hear from you.

With best wishes,




Rodrigo Bañuelos

# 2009 Distinguished Alumni

*On April 17, 2009, the College of Science honored distinguished alumni. This year's Mathematics Distinguished Alumna was Shirley A. Buccieri.*

Shirley Buccieri is a retired partner in Gibson, Dunn & Crutcher's Palo Alto office and was a member of the firm's Corporate Transactions Practice Group. Her practice focused on merger and acquisition transactions and corporate and securities matters. She practiced with Gibson Dunn from 1983 to 1995. She left the firm in 1995 to become general counsel of Transamerica Corporation, headquartered in San Francisco. In 1999, Shirley was a critical part of the management team that negotiated the multi-billion dollar sale of Transamerica to AEGON NV, a Dutch insurance conglomerate. After the sale, she founded Willow Place Partners, a Menlo Park, California-based corporate advisory firm specializing in mergers and acquisitions.

Shirley was named one of the top general counsels by Corporate Counsel magazine, has been selected as one of the top women in business in San Francisco, and was included in the publication "Going to the Top, a Road Map for Success from America's Leading Women Executives."

Shirley holds a Juris Doctor, magna cum laude, from the University of Akron School of Law. She received her B.S. (1973) in mathematics from Purdue, where she was elected to Phi Beta Kappa.



*Rodrigo Bañuelos and Shirley Buccieri*

*Math alum Linda S. Graebner was honored as the College of Science At-Large Distinguished Alumna.*

Linda Graebner is a veteran consumer products and direct marketing executive as well as turnaround specialist. In her role as president and CEO of Tilia Inc., she transformed a relatively small (\$9 million revenue), unprofitable, and insolvent company into a leading manufacturer of premier lines of small electric kitchen appliances (FoodSaver® and VillaWare® brands). She built a virtually unknown product (the FoodSaver® vacuum packaging machine) into the fourth largest category in small electric appliances at revenues in excess of \$200 million. She managed the sale of this privately held company to Jarden Corp. (NYSE) in 2002 in a \$185 million cash transaction. She continued to lead the company as a division of Jarden through 2006, enjoying continued growth in revenue and generating in excess of \$100 million additional cash flow for Jarden.

In 2001, Linda was honored with the Ernst & Young Manufacturing Entrepreneur of the Year Award for Northern California. She was cited as one of the "100 Most Influential Bay Area Business Women" by the *San Francisco Business Times* in 2000, 2001, and 2006 because of her company's success increasing and marketing new technology for the home.

Recognized as an expert in the housewares industry, Linda has served on several boards, and she recently joined the board of directors of Pacific Community Ventures, a unique organization providing both investment capital and advisory services to businesses serving low-income communities in California.

Linda received her B.S. (1972) in mathematics from Purdue University. In 1974 she received an M.B.A. from Stanford Graduate School of Business.



*Linda Graebner*

# Women in Mathematics Day

**Jill Pipher**, Professor of Mathematics at Brown University, was the featured speaker on October 7, 2008 at the Purdue Mathematics Department celebration of “Women in Mathematics Day.” Pipher delivered the Jean E. Rubin Memorial Lecture; her talk was entitled “Multi-parameter Fourier analysis.”



Jill Pipher

Pipher received her Ph.D. from UCLA and has been on the Brown University faculty since 1990. Prior to her appointment at Brown, she was a Dickson Instructor at the University of Chicago. Her awards include an NSF Fellowship, a Sloan Fellowship, and a Presidential Young Investigator Award. Pipher was department chair at Brown from 2005 to 2008.

Organized by Purdue Professor **Donatella Danielli**, the annual Women in Mathematics Day included a lunch for women of the department, an informal meeting with refreshments in the library lounge, and a dinner.

Next year’s event is scheduled for November 19, 2009. **Sun-Yung Alice Chang** of Princeton University will be the featured speaker.

Purdue mathematics alumnus **Joel Smoller** (Ph.D. 1963, advisor Meyer Jerison) received the 2009 George David Birkhoff Prize. The prize is awarded jointly by AMS and SIAM once every three years for an outstanding contribution to “applied mathematics in the highest and broadest sense.”

The brief citation for the 2009 award states, “To Joel Smoller for his leadership, originality, depth, and breadth of work in dynamical systems, differential equations, mathematical biology, shock wave theory, and general relativity.”

Smoller is the Lamberto Cesari Collegiate Professor of Mathematics at the University of Michigan. He received a Purdue College of Science Distinguished Alumnus Award in 2000.

(Note: The late Lamberto Cesari was a member of Purdue’s mathematics faculty for several years during the 1950s, until he left in 1960 to accept a faculty appointment at Michigan.)

## Purdue Ratchets Up Math Requirement

Purdue News Sources

High school students who want to attend Purdue University soon will need to take four years of mathematics courses instead of three.

The new admission requirement will take effect for the fall 2011 incoming class and will apply to all baccalaureate programs. This change makes Purdue the first state school to require students to apply with a degree greater than Core 40, one of the three diploma tracks available for Indiana high school graduates.

“This is very important for academic success in this university,” President France Córdova said recently at a board of trustees meeting. “We know from all of our students, no matter what discipline they are in, if they have four years of math, their critical-thinking skills are much improved.”

“We want Indiana students to succeed, and we want Purdue students to do well and excel,” says Randy Woodson, Purdue’s executive vice president for academic affairs and provost. “We know four years of math during high school is one of the best ways to prepare for college because it puts students on the right track from day one to do well in the classroom.”

According to Woodson, the change is not about selectivity, but about success. The vast majority – 95.1% – of Indiana students attending Purdue already take four years of college preparatory math, such as algebra, trigonometry, precalculus, and calculus.

*Comment: Many of our most highly accomplished mathematics alumni, including those who work in nontechnical professions such as business or law, attribute their professional success to the training they received as math majors.*

*Thousands of Purdue students enroll each year in high school level mathematics courses taught by our department. Exactly how the new admission requirement will impact enrollments in these courses remains to be seen.*

# Accolades



Provost Randy Woodson, mathematics professor **Steven Bell**, and President France Córdova on August 28, 2008 at the induction ceremony for the Book of Great Teachers. Professor Bell's name was added to others inscribed on a large wall plaque located in the Purdue Memorial Union. The Book of Great Teachers honors the accomplishments of Purdue's best faculty and recognizes their long-term contributions to the university. In 2006, Bell received the Charles B. Murphy Award, the university's highest teaching honor.

Emeritus mathematics professor Casper Goffman was also added to the list of great teachers.

Professor **Freydoon Shahidi** was appointed to the Editorial Board of the *Journal of the American Mathematical Society* (JAMS) for a four-year term as an Associate Editor. JAMS is among the leading mathematical journals in the world.

**Dongbin Xiu** received a "Teaching for Tomorrow Award." He will work alongside experienced Purdue faculty over the next year to address topics and experiences related to teaching and student learning. The award includes \$1000 in faculty development funds, made possible by the Purdue classes of 1944 and 1945.

Two mathematics faculty were promoted this spring: **Dongbin Xiu** to associate professor; **Aaron Yip** to full professor.

Betty Gick celebrates 30 years at Purdue this year. Betty has been a technical typist in the Mathematics Department since 1991, when she transferred from the Statistics Department.



Two staff members in the department observed Purdue service anniversaries in 2008: **Nancy Eberle**, graduate program coordinator (40 years); **Terry Loro**, undergraduate services office (20 years).

Mathematics Department staff were among those recognized at the annual College of Science "Staff Awards Program" and luncheon on February 4, 2009 at the Purdue Memorial Union.

**Kelly Beranger** — Professional Achievement Award. Kelly joined the department in 2005 as web editor. She earned a bachelor's degree at Purdue in English and film studies in 1998 and previously worked as a writer for the *Lafayette Journal and Courier*.

**Peter Cook** — Outstanding Service Award. Peter earned a master's degree in mathematics at Purdue in 1970 and since then has taught mathematics and served as the department's Schedule Deputy. Peter also received an Advisor's Award in April (see page 8).

**Robert McGraw** — Professional Achievement Award. Robert has been Computer Systems Manager for the department since 2003. He previously held programmer/analyst positions in Florida, Saudi Arabia, New Mexico, and Colorado before coming to Purdue in 2001 as manager of computing facilities for Electrical and Computer Engineering.

**Triva Woodley** — Customer Service Award. Triva earned a bachelor's degree from Purdue's School of Management in 2001 and has been Business Manager for the Departments of Mathematics and Statistics since 2005.



Ruth and Joel Spira Teaching Award recipients were honored at a reception in the library lounge on April 16, 2009. The award recognizes mathematics faculty who excel in teaching and inspiring students. This year's winners are (left to right):

**Dongbin Xiu** — Outstanding Teaching by a Junior Faculty Member

**Arshak Petrosyan** — Outstanding Undergraduate Teaching

**Bernd Ulrich** — Outstanding Graduate Teaching

**Greg Buzzard** — Outstanding Undergraduate Teaching

# Actuarial Science Awards

*Charles Bryan received a Distinguished Science Alumni Award on April 17, 2009.*

Chuck Bryan has been actively involved in the insurance industry for more than 35 years. He is founder and president of CAB Consulting in Columbus, Ohio, which provides management, statutory accounting and management, and actuarial consulting services to boards, companies, regulatory agencies, law firms, states' attorneys-general, and others. Chuck also teaches a junior-senior level course in risk management and insurance at Ohio State University and presents seminars to departments of insurance and boards of directors. He currently has board positions with Medical Mutual of Ohio, Safe Auto, Tower Insurance Group, and Ohio Bureau of Workers Compensation. Chuck is a member of the National Association of Corporate Directors and qualifies as a financial expert. He received the Distinguished Science Graduate award from Purdue University in 2007. Chuck earned his B.S. degree in mathematics in 1968, M.S. in mathematics from Purdue in 1969, and his MBA in general management in 1976.

*Dan Rubin received an Outstanding Science Alumni Award on September 4, 2008.*



*Dan Rubin*

Dan Rubin is currently a Senior Actuary for Nationwide in Columbus, OH in charge of the statutory, GAAP, and tax reserving for all the Individual Annuity product lines. He has held other positions at Nationwide in the Life Insurance and Corporate Actuarial departments. Dan is a Fellow of the Society of Actuaries (FSA) and a Member of the American Academy of Actuaries (MAAA). While

pursuing his math degree from Purdue, Dan served as President of the Actuary Club for the two years following the club's inception in 1984. Partly with his leadership, the club was able to continue its growth and grassroots campaign toward the establishment of a formal Actuarial Science program at Purdue. Dan continues to serve the program as a decade long member of the Actuarial Science Advisory Council. In his spare time, Dan enjoys golf, poker, and attending Columbus Blue Jacket hockey games. Dan and his wife, Lisa, reside in Dublin, Ohio with their son, Jack, and daughter, Lauren.



*Actuarial Science Program Director, Prof. Richard Penney, and Charles Bryan*

*Purdue's actuarial science program is thriving: on April 6, 2009, 48 students received Exam Awards at Actuarial Awareness Night. The award is given to undergraduate students who pass one or more Society of Actuaries exams. Most of our undergraduates pass at least two exams while earning an actuarial science degree at Purdue.*

*Additional student awards and actuarial science scholarships are listed on page 11.*

# Outstanding Student Continues Graduate Studies at Purdue

Former award winning Purdue undergraduate math major Jamie Weigandt (BS '08) has finished his first year of study in the Purdue Ph.D. program in mathematics and has made quite a splash. He was recently awarded a prestigious Graduate Research Fellowship through the National Science Foundation. This juiciest of graduate fellowships is a three-year award, including a \$10,500 cost-of-education allowance and a \$30,000 per year stipend. Only 22 of the 950 fellowships were awarded in the mathematical sciences this year, and Jamie is only one of two in the College of Science to receive one.

While an undergraduate at Purdue in mathematics, Jamie won several awards from the department (see box below), and he served as president of the Math Club in his senior year. He did a VIGRE Summer Undergraduate Research project on complex analysis with Professor Steven Bell in his sophomore year and another project on number theory with Professor Edray Goins in his junior year. This second project led to a research program that Jamie could follow into graduate school, and Jamie chose to stay on at Purdue in order to continue his work in the Ph.D. program with Professor Goins.

During the first week of his first semester of graduate school, Jamie passed an impressive four of the written qualifying exams for the Ph.D. program. He passed his last qual in January, and he is now poised to begin doing thesis research. His current work is in number theory,

*Jamie's Purdue undergraduate awards include:*

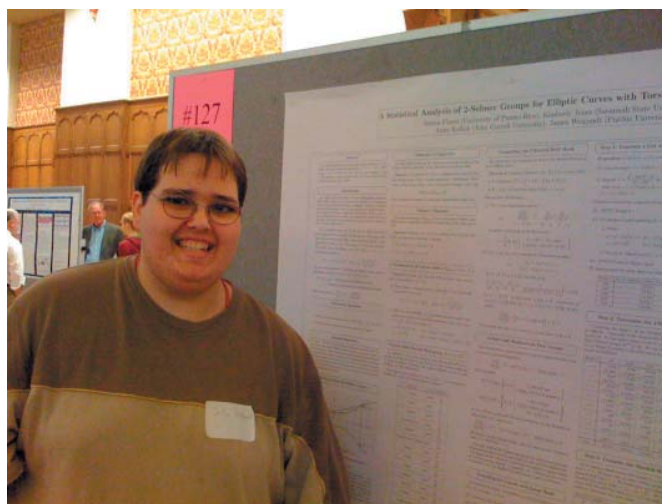
Mathematics Senior Achievement Award, 2008

College of Science Outstanding Junior, 2007

Glen E. Baxter Memorial Award, 2007

Meyer Jerison Memorial Award in Analysis, 2007

Leonard D. and Anna W. Berkovitz Scholarship,  
2006, 2007



*Jamie Weigandt*

with applications to statistics, on the algebraic properties of quartic curves of the form

$$y^2 = (1 - x^2)(1 - k^2 x^2) \text{ where } k = (t^4 - 6t^2 + 1) / (t^2 + 1)^2$$

for some rational number  $t$ . It is well known that the collection of rational solutions forms a finitely generated abelian group; the question is exactly how are the number of generators distributed according to  $t$ ?

Jamie conducted a statistical analysis of these so-called “2-Selmer ranks” and found some rather surprising results. His work entitled “A Statistical Analysis of 2-Selmer Groups for Elliptic Curves with Torsion  $Z_2 \times Z_8$ ” has appeared in the Summer Undergraduate Mathematical Sciences Research Institute (SUMSRI) Journal. He has given presentations on his research at the Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, as well as the Purdue Undergraduate Research Symposium (see picture above).

Although it is standard wisdom to advise an undergraduate math major of Jamie’s caliber to pursue a graduate degree at a different institution, we are thrilled that Jamie has stayed on at Purdue and that he will use his NSF Fellowship here. He is a Boilermaker par excellence!

# Graduate Program News

In response to feedback from the External Review Committee last October, the Graduate Committee set to work on improving the Ph.D. qualifier exam system, especially for our students with interests in applied math. A special committee was formed, consisting of grad chair Steve Bell and professors Greg Buzzard, Donatella Danielli, Dan Phillips, Jie Shen, and Aaron Yip. They canvassed the faculty during the winter for ideas and viewpoints and then turned the matter back over to the Graduate Committee, which then prepared an online survey to get an accurate sense of faculty opinion on these matters. The Committee made a formal proposal this spring, and the changes were approved for adoption by the voting faculty at a meeting on April 29.



Jeff McNeal

**Jeffery McNeal** of Ohio State University returned to campus on September 4 to be honored as the 2008 Outstanding Purdue Mathematics Alumnus. He gave a special colloquium talk “Non-holomorphic Projections and Extension of Biholomorphic Maps,” followed by a department awards dinner.

McNeal received a Ph.D. in mathematics in 1988; his advisor was Prof. David Catlin. McNeal’s research is in real

and complex analysis. He has been an invited speaker at numerous academic institutions nationwide, has been the principal speaker at international conferences, and has held visiting faculty positions at Harvard University, the Mathematical Sciences Research Institute (MSRI), the Schrödinger Institute in Vienna, and the Max Planck Institute in Bonn.

After completing his degree at Purdue, McNeal spent the following eight years at Princeton University, where he was director of graduate studies from 1993 to 1996. He then moved to Ohio State University, where he is Professor of Mathematics and Associate Dean in the College of Mathematical and Physical Sciences. His service at Ohio State has included ten years on departmental advisory committees, lecture committees, the Graduate Studies Committee, the Master’s Task Force, and the Communications Committee. He has also served on the National Science Foundation’s Advisory Panel, and he is an editor for the *Journal of Geometric Analysis*.

McNeal’s awards include the National Science Foundation Faculty Early CAREER Award, the Alfred P. Sloan Fellowship, the Max Planck Institute for Mathematics Fellowship, and an NSF Postdoctoral Fellowship.



Robert Bridges, Prahlad Vaidyanathan, Nicholas Wegman, Sarah Bryant, Jia Li, Kuan-Hua Chen

In keeping with our commitment to excellence, each fall the Department of Mathematics proudly recognizes Graduate Teaching Assistants for their outstanding efforts. Department Head Rodrigo Bañuelos presented the 2008-09 awards to six TAs (above) on November 11, 2008.

**Robert Bridges, Sarah Bryant, Prahlad Vaidyanathan, and Nicholas Wegman** were selected by the department to receive Purdue University Graduate Student Awards for Outstanding Teaching at the Celebration of Graduate Teaching banquet on April 23, 2009. The event is sponsored by the Committee for the Education of Teaching Assistants (CETA).

**Jaebang Kim** received an Advanced Graduate Teacher Certificate, one of the select few who completed the rigorous requirements set by CETA. To be certified, the graduate student must fulfill a number of competency requirements including extensive classroom teaching experience, teaching and mentoring other GTAs, conducting research in teaching, and attending workshops on various topics.

**James Price** received a 2009 Graduate School Excellence in Teaching Award. Only four such awards are given university-wide each year. Graduate students selected for this award must have demonstrated excellence in teaching and mentoring at the undergraduate and/or graduate level and have accomplishments in service/outreach and scholarly presentations/publications. This recognition is sponsored by the Graduate School, Committee for the Education of Teaching Assistants, and the Office of the Provost.

**The Mathematics Department recognized many outstanding students on May 1, 2009 at the annual department awards program.**

**PROBLEM OF THE WEEK  
AWARDS TO PURDUE STUDENTS**

*Awards*

*Fall 1<sup>st</sup> Prize* David Eldon

*Spring 1<sup>st</sup> Prize* Xingyi Qin

*Certificates of Merit*

*Fall:* Michael Bukkhart, Richard Eden, Sambit Palit, Huanyu Shao, Phuong Thanh Tran

*Spring:* Andrew Bohn, Michael Burkhardt, David Elden, Huanyu Shao, Phuong Thanh Tran, James Vaught, Tairan Yuwen, Wenyu Zhang



*Actuarial Science award winners: (front row) Trent Sahlin, Rachel Smith, Rebecca Lumley, Eric Krafcheck (back row) Elizabeth Moss, Parker Crosby, William McCartney, program director Prof. Richard Penney, Angela Hancock, Thomas Edson, Alex Morton*



**Yu Tsumura** with Ingeborg MacLane, who visits the department each year to present the Gerald R. MacLane award in honor of her late husband, a former faculty member and department head.

Yu received a B.S. from the University of Tsukuba in Japan and joined our Ph.D. program in fall 2008. He passed his written qualifier exams in January after only one semester. He received the MacLane award for both

his excellent performance on the qualifier exams and his course work. Yu is a member of the Purdue Juggling Club, where he is the resident expert on keeping three diabolos in the air simultaneously.



**Peter Cook**, Schedule Deputy for Mathematics, received the Advisors Award for his invaluable and patient assistance to counselors, students, and faculty during the last year. Peter has been the go-to person for questions related to Banner, the university's new online course registration and scheduling system that was implemented last year. Undergraduate advisors Ce-Ce Furtner and Janice Thomaz presented the award to Peter.

**COLLEGE OF SCIENCE AWARDS TO MATH MAJORS**

*Outstanding Seniors*

Arman Sabbaghi, mathematics and statistics

Rachel Smith, actuarial science and statistics

Zachary Sylvan, physics and mathematics

*Outstanding Juniors*

Philip Hebda, mathematics

Alex Morton, actuarial science

*Outstanding Sophomores*

Eric Krafcheck, actuarial science

Daniel Stratman, mathematics

*Outstanding Freshmen*

Parker Crosby, actuarial science

Sung Jun Ma, mathematics

*Spira Undergraduate Summer Research Award*

Alex Krzywda



## Your gifts make a difference!



The nine math majors pictured here with scholarship chair Prof. Greg Buzzard (far right) are but a few of the many recipients of Mathematics Department scholarships. We appreciate the support of all who currently help our students by contributing to our mathematics scholarship funds. In addition, we can offer suggestions for other ways to support students. For example, alumni Andris Zoltners and Joel Spira provide stipends for summer research (see page 12). A list of some of our departmental funds is available on our website:

<http://www.math.purdue.edu/people/alumni/>

### MATHEMATICS UNDERGRADUATE AWARDS

*Eugene V. Schenkman Memorial Award*  
Kun-Chieh Wang

*Glen E. Baxter Memorial Award*  
Philip Hebda, Joshua Rendall

*Michael Golomb Mathematics Award*  
Haiyun Zhao

*Meyer Jerison Memorial Award in Analysis*  
David Franco

*Merrill E. Shanks Memorial Award*  
Ryan Hoffman, Jessica Markstrom

*Senior Achievement Award*  
Amber Meyerratken, Arman Sabbaghi,  
Zachary Sylvan, Haijun Zhao

*MAA Math Competition Team (4<sup>th</sup> place)*  
Justin Chen, Eric Haengel, Daniel Stratman

*Putnam Exam Recognition*  
Kun-Chieh Wang (61.5 score), Brian Pace,  
Daniel Stratman

### MATHEMATICS SCHOLARSHIPS

*Thomas Arai Scholar*  
Justin Chen

*Leonard D. and Anna W. Berkovitz Scholar*  
Jeremy Cunningham

*Mark Hoppy Memorial Scholar*  
Jeremy Cunningham

*Virginia Mashin Scholars*  
Catherine Cohoat, Christopher Cunningham, Brian Pace, Joshua Rendall, Rebecca Seahorn, Remy Spontgen, Roger Tabchouri, Robert Winding

*Helen Clark Wight Scholars*  
James Gilmore, Megan Giordano, Linley Johnson, Mark Knight, Kristina Rubiano, Catherine Warner

*Andris A. Zoltners Scholar*  
Remy Spontgen

### GRADUATE STUDENT AWARDS

*2008-09 Outstanding Mathematics Teaching Assistants*  
Sarah Bryant, Robert Bridges, Kuan-Hua Chen,  
Jia Li, Prahlad Vaidyanathan, Nicholas Wegman

*Committee for the Education of Teaching Assistants (CETA) Celebration of Graduate Student Teaching*  
Robert Bridges, Sarah Bryant, Prahlad Vaidyanathan,  
Nicholas Wegman

*Teaching Academy, Associate Member*  
Jaebang Kim

*Graduate School Excellence in Teaching Award*  
James Price

*Gerald R. MacLane Award*  
Yu Tsumura

*Carl Cowen Exceptional Promise Award*  
Erin Malloy (incoming)

*Keedy Scholarships (incoming)*  
Deaghan Hallihan, Andrew Homan, James Packett,  
Anthony Rizzie

*T.T. Moh Fellowship*  
Qing Han (incoming)

*Zoltners Graduate Scholarships (incoming)*  
Alan Legg, Mariana Smit Vega Garcia, Lloyd West

### ACTUARIAL SCIENCE AWARDS

*AEGON Scholarship* Eric Krafcheck

*Alumni Scholarship* William McCartney

*Daniel Rubin Scholarships* Thomas Edson, Trent Sahlin

*Swiss Re Scholarships* Angela Hancock, Rebecca Lumley, Elizabeth Moss

*Outstanding Senior* Rachel Smith

*Outstanding Junior* Alex Morton

*Outstanding Sophomore* Eric Krafcheck

*Outstanding Freshman* Parker Crosby

# Mathematics Learning Technologies

The Department of Mathematics has embraced technology for several years now in order to enhance the quality of the educational experience of the students we serve.

Online homework was first implemented a few years ago in our pre-calculus courses. This was the natural place to begin as these students need to work individually and obtain immediate feedback on many types of problems. As an added benefit, the numbers of students receiving Ds, Fs, and the numbers withdrawing decreased significantly after the introduction of online homework.

Recently, we started phasing in online homework to our various freshman calculus sequences. Although it is too soon to declare any definitive results as with the pre-calculus courses, calculus students have responded positively to online homework.

For the various online homework systems we use, problems are customizable and homework is individualized. Rarely will any two students get precisely the same homework problem with the same numbers. Students are generally tech savvy and become comfortable with these online systems fairly quickly. This all helps to motivate and to necessitate students completing their own individual work.

For instructors and course coordinators, these calculus courses are run more efficiently, consistently, and uniformly. Moreover, office hour time can be spent more productively.

The online homework systems keep track of homework grades and perform other routine tasks, allowing instructors to monitor and instantly see how students are progressing throughout the semester. The online systems are constantly improving.

The Mathematics Department also has developed online (distance) versions of some of its most elementary algebra and trigonometry courses, and we hope to develop more elementary courses in this format. This gives students an opportunity to take courses while off campus in the summer and to juggle work schedules or other restrictions when on campus. Off-campus students are subject to the same course standards as their on-campus peers. Distance courses have even been useful for students in study abroad programs, when appropriate mathematics courses have not been available at their host institutions.

Finally, at the other end of the educational spectrum, we have been finding new ways to enhance our teaching by means of technology to some engineering graduate students taking mathematics courses. For many years and with much success, our department has offered distance courses through the Engineering Professional Education Master's Program. With the technology available now, this delivery is done via streaming video. These videos give students an opportunity to review lectures multiple times. The availability of these videos has been a big hit with students, and we are working now to build on this experience.

Acting on advice from the 2008 External Review Committee, the department recommended naming our 3-year postdoc assistant professors after emeritus professor Michael Golomb, who passed away in 2008 at the age of 98. This action was approved by Provost Randy Woodson and Interim Dean Jon Harbor. The department also consulted and received approval from Professor Golomb's daughters Miriam Golomb, Debby Sedgwick, and his brother, Daniel Golomb.

Professor Golomb had a long and distinguished career in our department, and his name is well identified with Purdue mathematics. The naming of our postdoc assistant professors brings us in line with other top departments around the country, which for many years have had names associated with these positions.

Beginning this fall, Golomb Assistant Professor will refer to our 3-year departmentally funded postdoc teaching and research positions. The term Research Assistant Professor will continue to be used to refer to our 3-year postdocs whose research funding is provided at least partially by their faculty mentors.

## NEW ARRIVALS

*The Mathematics Department will welcome the following faculty in August.*

### Assistant Professor (tenure track)

**Peter Albers**, Ph.D. University of Leipzig, 2005; Courant Institute, 2005-08; ETH Zurich, 2008-09  
*Research:* symplectic geometry and topology

### Golomb Assistant Professor (3 years)

**Al Momin**, Ph.D. New York University, 2008; Max Planck Institute, 2008-09  
*Research:* symplectic geometry and contact geometry

**Cheng Ouyang**, Ph.D. Northwestern University, 2009  
*Research:* stochastic analysis and its applications to partial differential equations

**Mihai Tohaneanu**, Ph.D. University of California, Berkeley, 2009  
*Research:* partial differential equations and general relativity

**Liz Vivas**, Ph.D. University of Michigan, 2009  
*Research:* several complex variables, holomorphic dynamics, complex geometry

### Research Assistant Professor (3 years)

**Akil Narayan**, Ph.D. Brown University, 2009  
*Research:* scientific computing and numerical analysis

### Visiting Assistant Professor (1 year)

**Randy Z. Qian**, Ph.D. Northwestern University, 2009  
*Research:* microlocal analysis and partial differential equations

# Faculty Transitions

*The Department welcomed seven new faculty members in August 2008.*



Professor of Mathematics (90%) and Computer Science (10%): **Saugata Basu** was previously a faculty member at Georgia Tech. His research centers on algorithmic and quantitative aspects of real algebraic geometry. A leader in this field, his presence at Purdue bridges the areas of algebraic geometry, commutative algebra, and combinatorial algorithms.



Associate Professor of Mathematics: **Fabrice Baudoin**, formerly of the University Paul Sabatier in Toulouse, works in the field of stochastic analysis, with broad interests in its applications to partial differential equations and geometry on the pure side and mathematical finance on the applied side. His presence in the department bridges several areas of pure and applied mathematics.



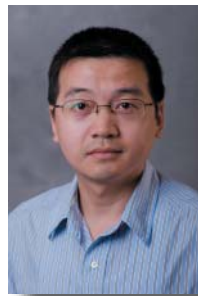
Assistant Professor of Mathematics (60%) and Education (40%): **Rachael Kenney** earned a Ph.D. in mathematics education at North Carolina State University in 2008. She was a research assistant for Project Bright IDEA II for the Department of Public Instruction in Raleigh, NC, and she was an instructor of mathematics at NC State. Her research focuses on students' use and understanding of mathematical syntax and symbols, and teaching and learning with technology.



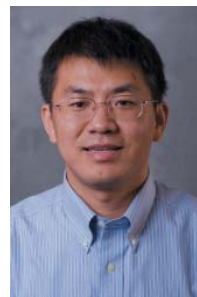
Assistant Professor of Mathematics: **Jianlin Xia** received his Ph.D. in 2006 from UC Berkeley and was an adjunct assistant professor at UCLA the following two years. His research interests lie in numerical linear algebra, numerical analysis, scientific computing, and differential equations. He has done work in statistical condition estimation methods for linear systems as well as eigenvalue problems.



Assistant Professor of Mathematics: **Svitlana Mayboroda** earned her Ph.D. at the University of Missouri-Columbia in 2005. She was a visiting assistant professor at the Australian National University for six months and then went to Ohio State where she was a Zassenhaus visiting assistant professor. She also spent six months at Brown University during 2007. Her research interests are harmonic analysis and partial differential equations; her work centers around elliptic boundary value problems and related areas in analysis.



Assistant Professor of Mathematics: **Peijun Li** earned a Ph.D. at the University of Michigan in 2005 and was a postdoc assistant professor at Michigan until his arrival at Purdue last summer. His research is in applied mathematics with an emphasis on modeling, analysis, and computation for direct and inverse scattering problems in electromagnetics and optics, as well as on numerical solutions of inverse problems in partial differential equations.



Assistant Professor of Mathematics: **Tong Liu** earned his Ph.D. at the University of Michigan in 2005. He then was a lecturer in mathematics for three years at the University of Pennsylvania and also visited the Université Paris-Sud for six months in 2006. His research interests are in arithmetic geometry, specifically in p-adic Galois representations and p-adic Hodge theory.

**Melvin Leok**, who joined our faculty as assistant professor in 2006, has accepted an appointment in the Mathematics Department at the University of California, San Diego.

At Purdue, Melvin developed an ambitious and outstanding research program for which he received a five-year NSF CAREER grant for his project "Computation Geometric Mechanics: Foundations, Computation and Applications." This work exploits certain geometric features to allow precise control of vehicles using natural dynamics, as opposed to brute force methods that use large control forces to overwhelm the dynamics.

Melvin has been an extremely engaging colleague and actively involved in departmental affairs at Purdue. We very much regret his departure, but at the same time wish Melvin the very best as he begins a new chapter of his career in California.

# Math Wiki Leads to Rhea and Summer REUs

No, a math wiki is not a name for a group of mathematicians in Hawaiian shirts. It is an interactive web site where users create mathematical content in the spirit of Wikipedia.org.

Mireille Boutin, Purdue Assistant Professor of Electrical and Computer Engineering and Mathematics, has created an educational wiki for Purdue undergraduates. She decided to call it a rhea, after the flightless bird, because the word “wiki” was already taken by the people at Wikipedia, and somebody else had already grabbed the word “kiwi” for something similar, thereby starting the flightless bird tradition. Check out Boutin’s Purdue rhea at <https://kiwi.ecn.purdue.edu/rhea/>

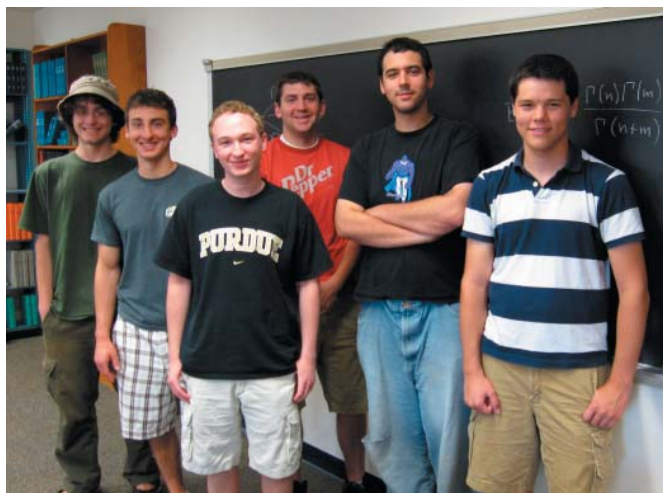
Math Professor Steve Bell was an enthusiastic supporter of Boutin’s rhea project from the beginning and decided to integrate the tool into his MATH 181 Honors Freshman Calculus class in the fall of 2008. Students in the class learned how to input mathematical formulas in LaTeX on the rhea and quickly made the tool part of their daily routine. In addition to giving each other homework tips, the students earned extra credit by creating articles on interesting topics in calculus that grew and evolved over the course of the semester. One article in particular about the convergence of Leibnitz’s famous slowly converging alternating series

$$\pi/4 = 1 - 1/3 + 1/5 - 1/7 + 1/9 - 1/11 + \dots$$

turned into a polished masterpiece over the course of the semester.

An interesting feature of a wiki is that users can easily trace who has contributed to an article and when. Professor Bell could determine that two MA 181 students, **Josh Hunsberger** and **John Mason**, had put in many hours on the Leibnitz series article and that they had discovered something that surprised Bell. The partial sums of the series alternate between being above the limit of  $\pi/4$  and below it. Bell suggested to the students that they try averaging consecutive partial sums to see if the result converges faster to the limit. Hunsberger and Mason determined that it converged much faster and then went on to show that the convergence could be further accelerated by averaging the averages. Bell was so impressed by the work that he invited the two to participate in a 2009 summer REU (Research Experience for Undergraduates) sponsored by Purdue alum, Andris A. Zoltners.

Hunsberger and Mason will be joined this summer by Purdue junior **Alex Krzywda** (the recipient of a College of Science Spira summer research award) to work on a project to improve the convergence of various types of infinite series, including Fourier series, by the averaging technique. Warn your kids to be careful on the internet. There could be predatory mathematicians lurking behind flightless birds out there!



Left to right: Eric Haengel, Alex Krzywda, John Mason, Josh Hunsberger, John Berlakovich, Matt Davis

**Eric Haengel**, who just completed his freshman year, has already enrolled in advanced undergraduate courses and during summer 2009 is reading with Professor David Drasin the text *Complex Analysis* by E. Stein and R. Shakarchi. The spirit of the book differs from that of the usual MA 425, 525, and 530 courses in that it gives special emphasis to connections with the Fourier transform and number theory (including a proof of the Prime Number Theorem).

Under the direction of Professor Uli Walther, students **John Berlakovich** and **Matt Davis** are working this summer on mathematical problems related to configuration of points in the plane which arise in several areas of applied mathematics, including electrical and computer engineering (Boutin, M. and Kemper, G., “On reconstructing  $n$ -point configurations from the distribution of distances or areas,” *Adv. in Appl. Math.* 32 (2004), no. 4, 709-735).

For example, suppose one is told the list of all 6 mutual distances of 4 points in the plane. Clearly one cannot recover their precise location in the plane from this information alone since simple Euclidean motions such as translations, reflections, and rotations do not affect mutual distances. However, one could ask whether their relative positions are determined. That is, can one from the distances alone (without knowing which distance came from which pair of points) reconstruct the configuration of the 4 points? As it turns out, “almost all” (in a quantifiable sense) configurations can be reconstructed from their distances. John and Matt will concentrate in determining, precisely, which configurations of four points in the plane cannot be reconstructed.

## In Memoriam

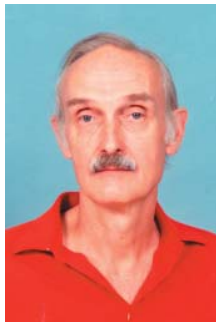
Professor Emeritus of Mathematics **Robert A. Gambill**, 82, of West Lafayette, passed away at his home on May 14, 2009.

He was born in Indianapolis on February 20, 1927. He graduated from Indianapolis Thomas Carr Howe High School in 1945 and served in the U.S. Navy during World War II. At Butler University he earned a B.S. in mathematics and physics in 1950. He then studied at Purdue University, where he earned an M.S. in 1952 and a Ph.D. in 1954 in mathematics.

Bob's first position after graduation was with Naval Avionics. He joined the mathematics faculty at Purdue in 1960. During his tenure at Purdue, he wrote two calculus textbooks and several papers, and he supervised three Ph.D. students. Bob also had an impact on the hundreds of undergraduates he advised over many years. He made significant contributions to the administration of the department, serving as Associate Head from 1965 to 1981.

After retirement in 1995, Bob remained interested in creating new mathematical equations. His favorite hobbies were fishing, poker, and his grandchildren. He loved music from Dixieland to classical. He was a volunteer for community service as a personal financial advisor and served as treasurer on the board of the Friends of the West Lafayette Public Library.

Bob is survived by his wife of 59 years, Phyllis, a daughter, Chandra Hronchek, a son, Robert Gambill II, six grandchildren, and two great-grandchildren.



Bob Gambill

**Charalambos D. (Roko) Aliprantis**, the James Brooke Henderson Distinguished Professor of Economics and Professor of Mathematics (courtesy) at Purdue, died on February 27, 2009.

Roko's areas of specialization included economic theory and functional analysis and operator theory. He



Roko Aliprantis

**Richard A. Hunt**, 71, Professor Emeritus of Mathematics, died at his West Lafayette residence on March 22, 2009 from acute myeloid leukemia.

He was born in St. Louis, Missouri on June 16, 1937. He is survived by his wife of 51 years, Ann, their children, John Hunt and Julie Wolf, and four grandchildren.

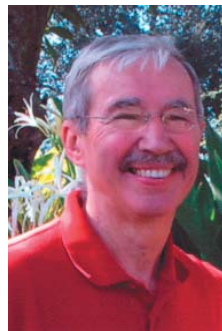
Dick's area of research was harmonic analysis; he was awarded the Salem Prize in 1969. His academic degrees were from Washington University in St. Louis, and his teaching positions were at the University of Chicago and Princeton University. He came to Purdue in 1969 and retired in 2000. He received numerous outstanding teaching awards including the Amrine Visionary Award, and he published two calculus textbooks.

Dick was a Master Gardener. Prior to 2000, he studied landscape design, and during retirement he worked as a landscape designer with colleagues at GardenArt. His friends and customers frequently recognized him as he drove his beloved red MGA convertible around town.

Athletics were an important part of Dick's life; he earned four varsity letters in football at Washington University and played competitive handball from 1956 until 2008. He competed in the Circle City Handball tournament for many years; his last competition was in 2008.

Taking garden tours with his wife, playing with his grandchildren, visiting with his family, and playing poker with his math and statistics buddies added much joy to his active life.

authored or coauthored over 90 scholarly articles and 12 books and was noted for his service to the profession. This included his organization of a biennial international conference on economic theory, the Society for the Advancement of Economic Theory, the founding of the scholarly journals *Economic Theory* and *Annals of Finance*, and his work as Editor-in-Chief of *Positivity*, a mathematical research journal.



Dick Hunt

Dick Hunt made several fundamental contributions to his field of research, harmonic analysis. These included the celebrated Carleson-Hunt Theorem on the almost everywhere convergence of Fourier series, his ground breaking work with Benjamin Muckenhoupt and Richard Wheeden on the boundedness of the Hilbert transform on weighted  $L^p$  spaces, and his work with Richard Wheeden on the boundary behavior of positive harmonic functions in regions in Euclidean space with Lipschitz boundaries. While the Carleson-Hunt Theorem remains as one of the "crown jewels" of harmonic analysis, his papers with Muckenhoupt and Wheeden also had a profound influence on the development of harmonic analysis and its applications to other areas of mathematics such as partial differential equations and potential theory.

Although the proof of the Carleson-Hunt Theorem remains to this day as one of the most difficult results in harmonic analysis, the result itself is not difficult to illustrate. It is well known that a musical tone can be decomposed into its harmonics. The difference between the sound of a violin and the sound of a flute playing the same note is because they have different higher harmonics. The French mathematician and physicist, Joseph Fourier, in his study of heat flow around 1800, realized that arbitrary functions can be decomposed into harmonics and that this decomposition could be a powerful mathematical tool in analyzing physical situations. This process of associating with a function what is now known as its Fourier series is formal, and one of the most fundamental results that one wants is that the Fourier series actually represents the original function. For functions with various degrees of smoothness, this representation had been derived earlier by several mathematicians. For arbitrary square integrable Lebesgue functions ( $L^2$ -functions), it was established by the Swedish mathematician Lennart Carleson in 1966 and for all  $p$ -integrable Lebesgue functions ( $L^p$ -functions for  $p$  strictly between one and infinity) by Dick Hunt in 1968.

For his work on Fourier series (completed just three years after receiving his Ph.D.), Dick was awarded the 1969 Salem Prize, whose list of recipients reads like a "Who's Who" of harmonic analysis. He also received a Sloan Foundation Fellowship in 1970 and was invited to address the quadrennial International Congress of Mathematicians in Nice, France in 1970.

Through the 1970s and into the 1980s, in addition to pursuing his own research, Dick supervised nine Ph.D. students, some of whom went on to successful academic careers. His office door was always open to his students.

# Math Conferences

*Mathematics faculty organized and hosted several meetings at Purdue during the past year.*

“Dynamical Systems in Physiological Modeling” was held at Purdue October 11-13, 2008. Purdue Professors Greg Buzzard (Mathematics) and Ann Rundell (Biomedical Engineering) were the local organizers. The scientific committee was Maarten de Hoop (Purdue), Martin Golubitsky (University of Houston and MBI), and Eduardo Sontag (Rutgers).

Plenary speakers were Jack Cowan (University of Chicago), Jeff Fox (Gene Network Sciences), Avner Friedman (Ohio State University and MBI), Leon Glass (McGill University), Jim Keener (University of Utah), Greg Smith (College of William and Mary), and Dave Terman (Ohio State University and MBI). A student tutorial was held two days prior to the conference to provide background for the plenary lectures. The conference was supported in part by the Institute for Mathematics and its Applications (IMA) through its Participating Institution (PI) program.

The Mathematics Department hosted the “Winter Midwest Topology Seminar” on Saturday, February 21, 2009. Organized by mathematics professor Jim McClure, the speakers were Ken Orr (Indiana University), Greg Friedman (Texas Christian University), Kate Ponto (University of Notre Dame), and Tom Goodwillie (Brown University).

The “4th Symposium on Analysis and PDEs” was held at Purdue May 26-29, 2009 on the occasion of the 55th birthday of Professor Nicola Garofalo, in recognition of his scientific achievements and his dedication to the mathematical community. It brought together some of the world’s most prominent specialists in the general areas of partial differential equations, harmonic analysis, and geometric PDEs.

Invited speakers were: Giovanni Alessandrini (Università di Trieste), Patricia Bauman (Purdue University), Luis Caffarelli (University of Texas, Austin), Luca Capogna (University of Arkansas), Steve Hofmann (University of Missouri), David Jerison (MIT), Carlos Kenig (University of Chicago), Ermanno Lanconelli (Università di Bologna), John Lewis (University of Kentucky), Marius Mitrea (University of Missouri), Duy-Minh Nhieu (San Diego Christian College), Scott Pauls (Dartmouth College), Sandro Salsa (Politecnico di Milano), Christina Selby (Johns Hopkins University), Zhongwei Shen (University of Kentucky), Giorgio Talenti (Università di Firenze), Dimiter Vassilev (University of New Mexico), Gregory Verchota (Syracuse University), and Qi Zhang (University of California, Riverside).



*Nicola Garofalo, Carlos Kenig, Donatella Danielli*

The conference organizers were Purdue mathematics professors Donatella Danielli, Arshak Petrosyan, and Aaron Yip. Funding was provided by the National Science Foundation (NSF), the Department of Mathematics, Purdue University, and the Institute for Mathematics and its Applications (IMA) through its Participating Institution (PI) Program.



*Purdue Professor Zhilan Julie Feng (front row, second from left) hosted “Differential Equations and Applications in Ecology and Epidemiology” at Purdue on December 8-10, 2008. Feng and Tim Lant of Arizona State University were co-organizers. The conference brought together leading experts and young researchers in mathematical biology to present their results and to discuss recent advances in mathematical modeling in ecology and epidemiology. Plenary speakers were Odo Diekmann (University of Utrecht), Mats Gyllenberg (University of Helsinki), Karl Hadeler (University of Tuebingen), and Hal Smith (Arizona State University). Invited speakers gave over 30 talks.*

# CCAM Highlights

## Newcomers

The Center for Computational and Applied Mathematics (CCAM) was pleased to welcome two new members during the past year: assistant professors **Peijun Li** and **Jianlin Xia**. See page 11 for more information about them.

Other new additions to the Center during the 2009-10 academic year included **Marcus Carlsson** as a Research Assistant Professor and **Herwig Wendt** as a Postdoctoral Research Associate.

## Computing Resources

CCAM acquired access to Purdue's SiCortex computer that consists of 3240 cores, with 6 cores per chip running at 500 MHz, and an aggregate peak performance of 3.2 Teraflops/sec. The SiCortex computer acquisition was initiated jointly by CRI and ITaP, with support by a large number of faculty, including members of CCAM. It was made possible through an award from Purdue's Provost with matching funds from a number of units on campus.

This expansion of available computing resources to the Center is the most recent one of many over the last few years. Since 2005, CCAM has worked closely with Information Technology at Purdue (ITaP) to develop its computational resources. CCAM has also funded the Prospero community cluster that consists of 19 Dell Quad-Processor 2.33 GHz Intel Xeon systems with 8 GB RAM and both Gigabit Ethernet and Infiniband interconnects. In addition, a SCREMS grant (PI Professor Jie Shen) provides 42 nodes in the Steele community cluster; Steele consists of 812 8-core Dell 1950 systems with various combinations of 16-32 GB RAM and Gigabit Ethernet and Infiniband interconnects. The large amount of memory in this system makes it well suited for large parallel jobs, providing fast communication between processors via shared memory.

*The Mathematics Department will host three conferences in fall 2009:*

ILLINOIS-INDIANA Symplectic Geometry Conference (October 10-11) – organized by Professors Yi-Jen Lee and Peter Albers

Midwest Several Complex Variables Conference (October 10-12) – organized by Professors Laszlo Lempert and Greg Buzzard

Midwest PDE Seminar (November 7-8) – organized by Professor Dan Phillips

## Conferences

CCAM members **Greg Buzzard** and **Aaron Yip** were co-organizers of conferences held at Purdue. For further information, see page 14.

## Fall 2009 Visiting Scientist Program

Since 2005, CCAM organizes a thematic visiting scientist program. The goal is to attract eminent scientists (e.g., National Academy of Sciences members) for short visits and weekend workshops that are of broad interest on campus. This fall, the Center will offer a visiting scientist program on "Microlocal Analysis and Inverse Problems." The program will feature a series of speakers on this theme throughout the semester. Please visit the CCAM Web site at <<http://ccam.math.purdue.edu>> for details regarding the dates and times of the presentations as they are finalized.



## Geo-Mathematical Imaging Group

GMIG is an industry and government funded, multi-disciplinary, inter-institutional graduate education and research program. GMIG puts significant resources into multi-scale approaches to (elastic) wave-equation modeling, scattering, inverse scattering, and tomography. The group works to develop improved technology to meet the complex challenges of modern day prospect evaluation, enhanced oil recovery, CO<sub>2</sub> sequestration, and general geological study of the Earth's subsurface by expanding the boundaries of knowledge of seismic imaging, inverse scattering and tomography through collaborative scientific activities and breakthroughs.

GMIG hosted its annual project review and advisory board meeting at Purdue for its corporate sponsors: BP, ConocoPhillips, ExxonMobil, StatoilHydro, and Total. Purdue's Envision Center provided the ideal venue for this event; its videoconferencing capabilities allowed GMIG's sponsors from across the United States and around the globe to convene in "real time" for several days of research presentations and collaboration. The meeting involved presentations from CCAM members, postdocs, and graduate students, as well as from several faculty and graduate students from Purdue's EAS Department who are actively involved in the GMIG research. External guest presenters included faculty from the Colorado School of Mines and the University of Illinois at Urbana-Champaign.

# Undergraduate Program News

In room 703 of a large building stuffed with faculty and graduate-student offices, computer facilities, etc. is an inviting oasis for our (mostly undergraduate) mathematics majors. The small windowless room is home to the **Purdue Math Club**, and it is a venue for working on homework, solving math problems, or networking among the members. It has a couch, some chairs, tables, and a computer; established members have a key, and at peak times during the semester, activity runs well into the night.

The club has open meetings every other week. For many of them, club members present mathematics problems from standard sources (such as the *American Mathematical Monthly*), and the group works together. Other meetings feature lectures by club members or outsiders.

During the past year, club president Dan Stratman spoke on projective geometry and organized many of the problem seminars. Among outside speakers were professors Edray Goins (elliptic curves), Brad Lucier (real computing), and Sam Wagstaff (Mersenne primes and an encore on connections between integer factoring and cryptography). Local artists Scott Frankenberger and Linda Vanderkolk (both of whom studied mathematics as undergraduates) presented some of the mathematical background (Penrose tilings) behind their mosaics that won an international competition and now greet all visitors to the Mathematical Sciences Research Institute (MSRI) in Berkeley, CA. (A larger and more extended version of this idea is in the main building at Ivy Tech, in Lafayette, Indiana.)

Three members of the club participated in the MAA Indiana Mathematics Contest (Dan Stratman, Eric Haengel and Justin Chen) and obtained a fourth-place finish. During the 2008-09 academic year, the popular Math Club t-shirts featured a sketch of Euler, some of his famous formulas, and the unique slogan “B’Euler up!”

The club’s webpage is: [www.math.purdue.edu/~mathclub/](http://www.math.purdue.edu/~mathclub/).

Eighth-graders from Tippecanoe and Benton counties had a field day with math during an all-day enrichment event sponsored by the **Math Education Club** on November 12, 2008 in the Purdue Armory. Approximately 100 students from Benton Central Junior High School, Wainwright Middle School, St. James Lutheran School, and Tecumseh Junior High School participated in hands-on activities.

“Math Field Day is a great service-learning opportunity for members of the Club,” said Jerry Woodward, mathematics K-12 outreach coordinator for the College of Science. “As future mathematics teachers, students in the club get practical experience in designing creative, standards-based lessons and working with students.”

Math Field Day was sponsored by the I-STEM Resource Network, the Department of Mathematics, the College of Science K-12 Outreach Program, and the Office of Engagement.

The club’s webpage is: <http://web.ics.purdue.edu/~mathed/>.

*Math PUrview is published annually for alumni and friends of the Purdue Mathematics Department.*

*Editor: Sally Goeke*

*Contributors to this issue: Steve Bell, Johnny Brown, Heather Connell, David Drasin, Edray Goins, Leonard Lipshitz, Uli Walther, Allen Weitsman*

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