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Indiana University Department of

Mathematics Alumni Newsletter

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Chair's corner

Banner year for faculty

This has been a banner year for awards for our math faculty. It's great to see such well-deserved recognition. I will run through the awards; for more information see the news section of our Web site www.math.indiana.edu

Davis

David Fisher is a fellow at the Radcliffe Institute for Advanced Studies at Harvard University for the academic year 2008-2009.

The American Statistical Association awarded Emeritus Professor Madan Puri the 2008 Gottfried E. Noether Award for his outstanding contributions to nonparametric statistics. Puri has won many other awards, including the Humboldt Reseach Prize, the IU Math Department's Rothrock Teaching Award, being named Distinguished Research Scholar by the College of Arts and Sciences, and being noted as one of the five most prolific authors in statistics. Aficionados of the history of math will recognize the name Noether; Gottfried is nephew of the famous woman mathematician Emmy Noether, who was in turn the daughter of algebraic geometer Max Noether (known for the Lasker-Noether Theorem); Emanuel Lasker was world chess champion for 27 years. But I had better get back to IU mathematics.

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Perelman's proof of the Poincaré Conjecture

by Matthias Weber

In 2005, the renowned geometer Grigory Perelman made three preprints available on the "arXiv," an Internet site used to make papers available to anyone. Perelman had an excellent track record of establishing very deep results, but he had been rather silent the preceding years. The preprints hit the mathematical community like a bomb: In sum, he claimed to prove a 100-year-old conjecture raised by Henry Poincaré: "Is a simply connected closed 3-dimensional manifold necessarily the 3-D sphere?" By now you probably will have raised an eyebrow. You can rest assured that this is a story where every aspect is fascinating. It's The Da Vinci Code for mathematicians; only it's true.

The Poincaré conjecture is about certain shapes called manifolds. Up close, all manifolds look like a piece of the familiar Euclidean space, and their global appearance is what really matters. Let me explain a bit. The surface of our planet Earth could be considered a gigantic piece of the Euclidean plane, which was in fact an early model for the shape of the world. That the earth is round was a major scientific discovery and gives us a first example of a 2-dimensional manifold, the surface of a sphere. A more complicated example is the surface formed by a bicycle tube or torus.

Here's another way of understanding tori: In the classic computer game "Asteroids," the user moves a spaceship across the screen. When the spaceship hits the border of the screen, it re-enters at the opposite side. If we could bend the screen, we could realize this behavior by first bending top and bottom edge of the screen together to form a tube and then bending left and right circles together to form a torus.

Surfaces more complicated than spheres and tori exist, but mathematicians have them all classified. We have shown that every closed surface can be cut along circles into simple surfaces, which are a sphere, or a tube, or a sphere with three holes. This theorem is now proven in introductory topology courses.

Perelman in Münster, 1992

There is, however, more to it: Each of the simple pieces above comes with a most natural geometry. The sphere itself carries the spherical geometry, the cylindrical tube carries the flat Euclidean geometry, and the 3-hold sphere carries what is called a hyperbolic geometry. These three geometries are the foundation of modern 2-D geometry. The fact that the building blocks of all closed surfaces have a natural geometry can be used to show that in fact all closed surfaces admit one of these three geometries.

Let's return to the Poincaré conjecture, which is about closed 3-D shapes. The simplest example is the 3-D sphere. This is not the same as the ball and already rather hard to visualize. Perhaps the following helps: If we model a 2-D sphere using a rubber balloon and puncture the balloon at one point, we can stretch the rubber piece out to become a disk-like shape. This disk has as its boundary a circle, but in the actual sphere, all the points of this circle come together to one point, the one where we punctured the balloon. By analogy, we can take as a model of the 3-D sphere a solid ball, with the stipulation, that all points on its boundary (which is a 2-D sphere now) come together to one point.

As another example of a 3-manifold, we generalize the asteroids model of the torus. Suppose we are in a room shaped like a rectan-

(*continued on page 2*)

Perelman

(continued from page 1)

gular box. Imagine that when we exit through one wall, we re-enter the room through the opposite wall. If this is the case for all six walls, we are trapped in a 3-D torus.

While on the small scale of our daily life we do not encounter such rooms, one of the most challenging open questions of physics is what the actual shape of our 3-D universe is. How could one find out? One way is to find characterizations of shapes by certain simple properties. For instance, the 2-D sphere has the property that it is simply connected. This means that if you lay out a rope on the surface of a sphere with both ends tied together, you can pull the rope in by moving it across the sphere but not lifting it away from it. This is not true for the 2-D torus: If the rope traces out the inner rim of the torus tube, there is no way to pull it together at one point. This property, surprisingly, characterizes the sphere. More precisely: A simply connected, 2-D closed surface is the 2-D sphere. Again, this is proven rigorously in introductory topology courses.

Poincaré was looking at 3-D shapes, and, failing to find a counter example, he asked in 1904 whether the same is true for 3-D closed manifolds: Is every simply connected closed 3-D manifold the sphere?

In the following 70 years, much progress was made in understanding general 3-D manifolds, but very little toward a resolution of this conjecture.

Then, in the 1970s, William Thurston made another conjecture: Every closed 3-D manifold can be cut along 2-D spheres and 2-D tori into certain simpler pieces, which all carry a natural geometric structure.

This geometrization conjecture is very much analogous to the classification of 2-D surfaces, except that it is much more complicated. First, the decomposition happens across more complicated shapes; second, in three dimensions, there are eight natural geometries, not only three. But this conjecture would still allow for a rough classification of all 3-D manifolds. Moreover, Thurston showed that his conjecture would imply the Poincaré conjecture. He also proved his conjecture for large classes of 3-D manifolds, hereby founding several entirely new areas in geometry and topology. But Thurston's methods could neither resolve the geometrization conjecture nor the Poincaré conjecture.

In 1982, Richard Hamilton introduced a new technique, combining classical Riemannian geometry with modern geometric analysis. His first result states: A simply connected closed 3-D manifold with positive Ricci curvature is the sphere.

Besides the assumption about curvature, this is just the statement of the Poincaré conjecture. To understand the curvature assumption, it again helps to look at surfaces: Every surface in space has at every point a quantity associated, which is called the Gauss curvature. This measures how the surface bends in space. For a round sphere of radius r, the Gauss curvature is 1/r. Surfaces also can be negatively curved: They are then saddle-shaped. For instance, the surface of a torus has negative curvature at the inner rim but positive curvature at the outer rim. A theorem in classical differential geometry states that any simply connected closed surface of positive curvature must be a sphere. Hamilton's result is a direct generalization of this to three dimensions.

> "... One of the most challenging open questions of physics is what the actual shape of our 3-D universe is. How could one find out?"

The idea in the proof of Hamilton's theorem is to deform the surface so that its curvature becomes eventually constant — in which case, it must be a round 3-D sphere. This deformation is achieved through a nonlinear partial differential equation, now called the Ricci flow.

Subsequently, Hamilton outlined a program with the goal to remove the curvature assumption from his theorem and to apply to Ricci flow also to general closed 3-D manifolds, with the hope to prove the geometrization conjecture.

While significant partial progress was made in this program, the breakthrough came only in 2003 and 2004, when Grigory Perelman made three papers available on the Mathematical Preprint Server, the famous arXiv. These papers overcame all the remaining difficulties in the Ricci flow program and thus established both the Poincaré conjecture and the hyperbolization conjecture. This, however, was not immediately clear. The papers were extremely technical and dense, and involved completely new concepts that Perelman had invented and no one had seen before. Experts in the field worked for at least two years to verify Perelman's claims, but now his proof is generally accepted.

People, of course, wonder: Who is Perelman, where did he come from, and why didn't he explain his results more carefully?

I first met Perelman at a differential geometry conference in Münster in 1992, Germany, when he was a postdoc from Petersburg. He was already famous then for his spectacular and technical work on singular spaces of positive curvature. The best way to talk to him was while he took long walks through the city. He was very shy, but always very concentrated and apparently in deep thought. I met him again in Berkeley in 1993, where the MSRI was sponsoring a year of special activities in Riemannian Geometry. On one of his first days there, he was mugged late in the evening while walking the streets with Bernhard Leeb. Leeb's wallet was taken, but the robber ran away after looking at Perelman a second time.

Then, at a conference on positive curvature, Perelman told the organizers that he just found an elegant proof of the Cheeger-Gromoll conjecture, but didn't want to give a talk about it—his other work was much deeper and more important. While true, it gives an idea about Perelman's attitude toward mathematics. On one side, he feels personally challenged by the hardest problems available, but doesn't care at all about public appreciation. This became dramatically clear in 2006 when Perelman refused the Fields Medal—the highest honor in Mathematics, comparable to the Nobel Prize. The Poincaré conjecture carries an even higher prize tag. Its established proof is worth $1 million, a prize announced in 2000 by businessman Landon T. Clay for the solution of one of seven so-called millennium problems, one of which was the Poincaré conjecture. Perelman has stated that he will decide about accepting any prize money only when it is offered.

Matthias Weber is a geometer in the IU Mathematics Department. You may enjoy seeing wonderful images of minimal surfaces created by Professor Weber at: www.indiana.edu/~minimal/index.html.

Mathematics

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COLLEGE OF ARTS AND SCIENCES
INDIANA UNIVERSITY
Bloomington

2007 & 2008 awards

Undergraduate Awards

Outstanding first-year students

2007: Anthony David Bowen, Peter Lunts, Victor Rusu, and James Michael Sullivan (Thelma Abell Prize); Peter Lunts and Aren Max Wilson-Wright (Ciprian Foias Prize); Aren Max Wilson-Wright (Ruth E. Gilliatt Memorial Scholarship); Caleb Kim Schloss Maxson and Nathan Beary Blustein (Donald Otto Koehler Scholarship); Samuel Joseph Kovenz Adams, Shawn David Azman, and Xiangyu Gong (Marie S. Wilcox Scholarship)

2008: Angela Marie Lubbers and Kristen Vanessa Sargent (Thelma Abell Prize); Zachary A Doenges (Ruth E. Gilliatt Memorial Scholarship); Carlo E Angiuli, Laura Frances Goins (Marie S. Wilcox Scholarship)

Outstanding second-year students

2007: Kerry Ellen Leuschel (Thelma Abell Prize); Yun William Yu (Cora B. Hennel Memorial Scholarship); Neil Shailesh Shah and John Richard Ullman (Marie S. Wilcox Scholarship)

2008: Nathan Beary Blustein (Thelma Abell Prize); Valkyrie Arline Savage (Ciprian Foias Prize); Peter Lunts (Ruth E. Gilliatt Memorial Scholarship); James Michael Sullivan (Cora B. Hennel Memorial Scholarship); Stephen Brooks Beckley, Victor Rusu, Saxon William Stiller (Marie S. Wilcox Scholarship); Matthew Paul Spence (Noyce Scholar)

Outstanding third-year students

2007: Seth Michael Risinger and Angela Diane Sage (Thelma Abell Prize): Elizabeth Ellen Hathaway (Ruth E. Gilliatt Memorial Scholarship); Daniel Vincent Barron and Jamil P. Ortoleva (Cora B. Hennel Memorial Scholarship)

2008: Timothy Grady Cobia, Jenna Louise Goen, Nick Andrew Krabbenhoeft, Yun William Yu (Thelma Abell Prize); Neil Shailesh Shah, John Richard Ullman (Cora B. Hennel Memorial Scholarship); Elizabeth Ellen Hathaway, Kristen Marie Koning, Sarah Michelle Loos (Marie S. Wilcox Scholarship).

Outstanding fourth-year students:

2007: Jean G. Hancock (Thelma Abell Prize); Aaron Daniel Cantrell and Dov J.

(*awards continued on page 7*)

New scholarship established

Anne B. Koehler established the Donald Otto Koehler Scholarship in 2006 in memory of her husband, who had a lifelong interest in mathematics. The Koehler's desire to support a mathematically talented student who is well rounded in other subjects, especially musical pursuits such as choir or band.

Anne is a professor at Miami University in Ohio, where she teaches business administration and decision sciences. She attended Indiana University, earning her BA, MA, and PhD degrees. Indiana University also afforded her the chance to meet Don Koehler, a gifted musician and composer; through him, she experienced some of the musical riches that Bloomington has to offer.

Don earned his MA and PhD in mathematics from Indiana University. He earned his undergraduate degree from Hanover College in mathematics. But he also loved music. Although he took lessons while he was a student at Hanover College, he was not an accomplished pianist. He sang in church choirs, including the choir of the Methodist Church in Bloomington where the director and many of the choir members hail from Indiana University's Jacobs School of Music. Don even composed a few short pieces, including an introit sung by the choir in Bloomington.

You can read more about this fascinating woman and her lifelong relationship with Indiana University at www.math.indiana.edu/programs/undergrad/finaid/koehler.pdf.

Active, accomplished year for Math Club

In the academic year 2007–08, the IU Math Club was very active. The year was one of transition. In the fall semester, outgoing president Jamil Ortoleva shared power with new president Chris Durden. In the spring, Sarah Loos took over as president. It is only in recent years that the Math Club has been student-led. This has led to an increased level of activity — with meetings almost every week — and to extraordinarily successful student initiatives. For instance, Ortoleva is best known for his enthusiastic belief in student participation in the Putnam exam, a rigorous national mathematical competition. He gave inspiring orations about why students are well-advised to take the Putnam exam even if they can't solve any of the problems. It was through Ortoleva's initiative that club began holding periodic Putnam training sessions, above and beyond the Putnam seminar given by the department. As a result, in part, of this increased level of activity, IU's Putnam team, consisting of Joseph Pacold, John Ullman, and William Yu, placed 26th among universities in the United States and Canada. This was our best showing in recent memory.

Besides Putnam training sessions, the club listened to a variety of lectures by faculty, graduate students, and sometimes the undergraduates themselves. Our exploits weren't only academic. The club was never above challenging its rivals from Swain Hall, the IU Physics Club, to matches in billiards, bowling, or ultimate frisbee.

The faculty advisors to the math club were Nets Katz, David Fisher, and Chris Connell, and we prided ourselves on doing as little as possible. We tried always to be helpful of course, but our goal was to let the club's members lead the group in ways best suited its interests. Members did not let us down, and in the process they became more closely connected to the exciting world of mathematics. — *Nets Katz*

IU's team placed 26th among U.S. universities in the 2008 Putnam Exam, the best showing in recent memory.

Retiring faculty

Maynard Thompson

Maynard Thompson has been an institution in the math department and at Indiana University, serving over 45 years. He received his PhD in 1962 from the University of Wisconsin. His thesis title was "Approximation by polynomials whose zeros lie on a curve."

Thompson spent his entire academic career at IU, a career which has focused on mathematical modeling, on teaching and outreach, and on a distinguished administrative career.

Thompson

Thompson was one of the first in the nation to understand the role of math modeling in the undergraduate curriculum outside of the traditional applications to physics and engineering. He wrote several books, most notably two joint with Dan Maki, Mathematical Modeling and Computer Simulation, and a book that has changed the lives of perhaps 100,000 IU students, Finite Mathematics.

He has been involved with the international Mathematical Contest in Modeling for many years, as judge, as chair of the competition, and as a writer of problems. He has been on many, many thesis committees in fields as diverse as political science, geography, psychology, sociology, business, economics, physics, chemistry, and education.

Thompson excelled in the classroom and developed several courses at the undergraduate level, including Math M447–M448 Mathematical Models and Applications. He has been a consistent and effective advocate for applied mathematics and mathematical modeling at the undergraduate level, as well as outreach to K–12 teachers on these topics. Thompson is a winner of the Rothrock Teaching Award, the department's premier teaching recognition.

He engaged in mathematical outreach for many years, for example in the Math Throughout the Curriculum project. The department owes much to him and to Dan Maki (who retired in 2007) for their outreach efforts, and their joint contributions will be quite difficult to replace.

Thompson has had an amazing administrative career. He was director of graduate studies and the chair of the department of mathematics, later serving as an associate dean at the graduate school. Next he was associate dean at the IU College of Arts and Sciences, essentially the guy who runs day-to-day operations. He then rose further, and became dean, and then vice-chancellor of budgetary affairs. In 2002 he returned to the math department as an ordinary faculty member.

When President Adam Herbert was seeking a top-level academic advisor, he asked Thompson to fill the post. Thompson came out of administrative retirement to serve in that capacity during the most difficult times of Herbert's presidency.

Although now officially retired, Thompson currently is continuing his outreach efforts as the principal investigator and project director of the huge Math Research Partnership NSF grant.

Thompson is a level-headed, clear-thinking, thoughtful, modest, and wise man. Thank you, Maynard for your service to mathematics, to students, to the department, and to IU. —*Jim Davis*

Victor Goodman

Victor Goodman received his BA in mathematics at the University of Kansas in 1965, and his PhD in mathematics at Cornell University in 1970. After spending two years as a postdoctoral fellow at the University of New Mexico, Goodman joined the mathematics department at Indiana University as an assistant professor. He was promoted to associate professor in 1978 and to full professor in 1992.

Goodman

In his research Goodman made significant contributions to mathematical topics, primarily in probability theory, including Brownian motion and other Gaussian processes, empirical processes, limit theory for random variables taking values in abstract spaces, stochastic integrals and stochastic differential equations, and financial mathematics. The breadth of his research interests and the quality of his work are reflected in the range and quality of journals in which his papers have appeared, including the *Proceedings of the American Mathematical Society*, the *Transactions of the American Mathematical Society*, and the *American Journal of Mathematics*; top probability journals; and also the *Journal of Mathematical Psychology*. He and two co-authors published a special invited paper in the Annals of Probability in 1981. In 1992 he was elected a fellow of the Institute of Mathematical Statistics, in recognition of his research and his service to the profession.

Goodman also made his mark as a teacher of courses at all levels an in a broad spectrum of mathematics subjects. He has given excellent seminar talks on probability theory and statistics, and he was recently appointed adjunct professor in the new Department of Statistics. Over the years he has spent tremendous time mentoring graduate students. Nine IU students completed a PhD degree in mathematics under Goodman's direction. And as he retires, he will continue to advise his current PhD students. In recognition of his contributions to the teaching of mathematics, Goodman received the the 2001 Rothrock Mathematics Faculty Teaching Award, the department's most prestigious teaching award, and the Indiana University Trustees Teaching Award in 2005.

With Professor Joseph Stampfli, Goodman co-authored the textbook The Mathematics of Finance: Modeling and Hedging, published by the Brooks/Cole Publishing Co. He and Stampfli together developed a course in mathematical finance. And in consultation with faculty members in the Department of Economics and in the Kelley School of Business, Goodman developed a master's degree program in mathematical finance and served as its director. For 10 years he has mentored graduate students in the field of mathematical finance. Goodman also organized and ran IU's summer 2006 Research Experience for Undergraduates program in mathematics.

Goodman has also contributed substantial service not only to IU but to the mathematics community in general. He served the Mathematics Department as director of undergraduate studies, scheduling officer, colloquium chair, and director of graduate studies. He also served on numerous ommittees and organized many conferences and symposia — including the substantial Second International Symposium in Probability and Applications, sponsored by the Institute of Mathematical Statistics and held at IU in March 1993. That conference brought at least 150 mathematicians from around the world. Goodman also supervised the actuarial exams at IU for several years and served for a year as an evaluator for mathematics teaching candidates in the Malaysia Cooperative Program. For well over a decade he was associate editor of the journal *Statistics and Probability Letters.*

He has also been a very good person to go to for a sound, common sense perspective and advice when one is confronted with puzzling predicaments that arise in the course of one's own professional work.

(continued on next page)

Retirees

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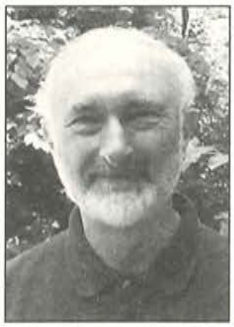
Goodman also has a broad range of interests outside of mathematics, including, among other things, skiing, hiking, golf, horseback riding, and flying small airplanes. He is a skilled and steady sailor and has won several sailing regattas, including one on the Ohio River. He has served as a board member for the IU Yacht Club and the Bloomington Yacht Club. Goodman is a very good friend to all who know him. We all wish him and his wife, Jackie, a long and happy retirement, with many more years of enjoyment with endeavors in mathematics, sailing his boat Sister Midnight and other interests. — *Richard Bradley*

John Challifour

John L. Challifour was born in 1938 in Bristol, England. His undergraduate degree was obtained at the University of California, Berkeley in 1960, where he earned highest honors. He was nominated to membership in Phi Beta Kappa and awarded the Departmental Citation in Mathematics by the UC Berkeley Mathematics Department.



Challifour

He returned to the U.K. for his graduate work, receiving his PhD in mathematical physics from Cambridge University in 1963. John was clearly no stranger to trans-Atlantic travel, for he returned to the U.S., taking a position as instructor and then lecturer at Princeton University, where he worked from 1963 to 1966. He joined the faculty at Brandeis University in 1966 as an assistant professor, and in 1968 joined the Indiana University faculty as associate professor of mathematical physics. He was promoted to full professor in 1978 and holds appointments in both the IUB Mathematics and Physics departments.

Challifour's research has been concentrated on mathematically rigorous formulations of quantum field theory. In this work, he has never allowed the mathematics to overwhelm the physics. He is perhaps best characterized as a physicist who handles mathematics rigorously (as opposed to a mathematician with an eye on physical applications). He has an excellent reputation among mathematical physicists, as evidenced by his many outside appointments over the years. These include a visiting membership in the Mathematics Research Center at University of Wisconsin–Madison; visiting scientist at CERN; membership in the Cargese Institute on Gauge Theories; and visiting professorships at the Institut fur Theoretische Physik at the Universitat Gottingen, the University of British Columbia, and the Center for Interdisciplinary Research at the Universitat Bielefeld. In 1984, Challifour was elected as a fellow of the American Physical Society, and in 1987, he was awarded the prestigious Alexander von Humboldt Senior U.S. Scientist Award by the Institut fur Theoretische Physik.

Challifour served as an associate editor of the Journal of Mathematical Physics for 13 years, and in that capacity was valued by its editor, Roger Newton, for his extensive knowledge of both physics and mathematics, as well as for his good judgment.

Perhaps the professor's greatest recent contribution to IU is his outstanding service over the last six years as associate chair of physics. His extraordinary efforts over this time have made the department a substantially better place; he has truly made a difference for the better. He has managed the academic side of the department with unrivaled effectiveness, and has the gratitude and thanks of the Physics Department for a job well done. Whatever I have been able to accomplish as chair is largely thanks to the work that John has done 'in the trenches'. John, I will forever be grateful. Thank you. — *Jim Musser, Chair, Physics Department*

Chair's corner

(continued from page 1)

Hari Bercovici received the Béla Szőkefalvi-Nagy Medal for the year 2007. He has contributed 14 definitive research papers to the Acta Scientiarum Mathematicarum, enriching the Sz.–Nagy–Foias theory of contractions with beautiful, fundamental theorems."

Roger Teman was elected to the French Academy of Sciences. The honor is due to his work on partial differential equations and numerical analysis with applications to fluid flow and geophysics. Teman has become a world record holder in quite a different area recently. According to the Web site www.genealogy.ams.org, Teman has directed 101 math PhD students, more than anyone else in the world. Eighteen obtained PhDs from IU.

Professor Bill Wheeler won the campus-wide 2008 Distinguished Service Awardin recognition of his work on the new Policy on Undergraduate Admission and on the new General Educational Proposal (both take effect in 2011) and his development of the math department's WebWork Online Homework System used in the large math courses M118, M119, and M211. I am sure Wheeler has the record for the most students taught by any IU math faculty member; he often teaches large lectures in freshman courses.

Our students have won external awards too. Math major William Yu won a Goldwater Scholarship, widely considered the most prestigious award for undergraduates studying the sciences in the U.S. Michael Bateman won the J. Stewart and Dagmar K. Riley Graduate Fellowship in support his dissertation. I'm sure alumni have earned awards as well. Please let us know. — *Jim Davis*

Departmental leaders

Jim Davis continues as chair of the department and Kent Orr as the director of undergraduate studies. Kevin Zumbrun finished his service as director of graduate studies; his successor is Ji-Ping Sha.

New faculty

Mihai Cuicu received his PhD in 1996 from the University of Michigan. After spending a year at the Mathematical Science Research Institute in Berkeley and a year as a member of the Institute for Advanced Studies in Princeton, he was on the faculty at Georgia Tech. His research specialty is enumerative combinatorics; here is a mathematician who can really count! His recent work found intriguing connections between tiling the plane, omitting a few holes, and Gauss' law for point charges placed at the holes. This connection between combinatorics and statistical physics is exciting for both mathematicians and physicists. Ciucu joined the department in the fall of 2007 as an associate professor with tenure.

Ciprian Demeter received his PhD in 2004 from the University of Illinois and held a postdoctoral position at UCLA. He is an expert in ergodic theory and harmonic analysis, with interests in additive combinatorics. He, in collaboration with Lacey, Tao, and Thiele, generalized the famous Birkhoff Ergodic Theorem. Demeter joined the department in fall 2007 as an assistant professor, but spent his first year on leave as a member of the Institute for Advanced Studies in Princeton.

Matvei Libine received his PhD in 2002 from Harvard University. He had postdoctoral appointments at the University of Massachusetts and at Yale University. Libine's mathematical interests include representation theory, symplectic geometry, and mathematical physics. He has significant results on the representation theory of noncompact groups and on quaternionic analysis. Libine joined the department this fall as an assistant professor.

Matthias Strauch received his PhD in the fall of 1997 from the University of Bonn in Germany. Since that time has had held appointments at the University of Muenster in Germany and at the University of Cambridge in England. His research is a mix of number theory, geometry, and analysis, especially of the p-adic type. Strauch joined the department this fall as an associate professor.

Faculty awards honor teaching

Jim Davis presents an award to Jiri Dadok. Richard Bradley, Linda McKinley and Scott Brown look on.

- **Rothrock Mathematics Faculty Teaching Award:** Robert Glassey (2007); David Hoff (2008)
- **Indiana University Trustees' Teaching Award:** Michael Jolly, Kent Orr, and Peter Sternberg (2007); Richard Bradley, Scott Brown, Jiri Dadok, and Linda McKinley (2008)
- **Departmental Lecturer Award:** Greg Peters (2007)

New postdoctoral fellows

Teena Gerhardt joined the department in the fall of 2007 as a Zorn Postdoctoral Fellow. She received her PhD at MIT. She is an algebraic topologist who studies topological Hochschild homology and algebraic K-theory.

Nathan Glatt-Holtz received his PhD from USC this summer and joined the department this fall as a Zorn Postdoctoral Fellow. His research interests include partial differential equations and applications to geophysical fluid dynamics.

Irine Peng joined the department this fall as a Zorn Postdoctoral Fellow, after receiving her PhD from the University of Chicago. She works on geometric group theory — particularly, the quasi-isomorphic classification of solvable groups.

Mihai Staic received his PhD from the University of Buffalo and joined the department in the fall of 2007 as a Zorn Postdoctoral Fellow. His interests include quantum topology and quantum groups.

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www.indiana.edu/~math

Alumni notebook

Before 1960

Patricia Peterson Danielson, BA'45, lives in New Castle, Ind., with her husband, Donald, BS'42, LLD'94, a member of the IU Foundation Board of Directors and past recipient of the Herman B Wells Visionary Award from the IU Foundation.

Tea Leaves and Dreams, a historical novel by **Bess Makris Stamatakos**, BA'51, MA'62, was published by Feather Star Publishing in August 2007. Stamatakos' husband, Louis, BS'50, MS'51, EdD'58, as well as her children, Theodore, JD'90, and Timothy, BS'93, are IU graduates. She writes that she has "been an educator most of my life, retiring in 1992. I taught high school mathematics for seven years, at a local community college for nine or ten years, and at Michigan State University for 10 years." Stamatakos lives in Okemos, Mich.

1960s

In July 2007, **Marianne Tracy Cullers**, BA'60, of Manhattan, Kan., received a Spirit of Service Award from the Corporation for National and Community Service. As a Senior Corps RSVP volunteer, she founded the Hand to Hand Program, which has tutored more than 600 children since 1996. Cullers' husband, Robert, BS'59, MAT'62, is a professor at Kansas State University.

1970s

In June, **Michael C. Schriefer**, BS'72, MS'77, of Santa Claus, Ind., retired from North Spencer County School Corp. after 35 years. He served 19 years as a math teacher, six years as a middle-school principal, and 10 years as assistant superintendent. He received the Indiana chapter of the National School Public Relations Association publication award as well as the National Middle School Association Outstanding Achievement Award. Schriefer was a presenter at the International Conference on Education in Corpus Christi, Texas, and at the National Title I Conference in Long Beach, Calif.

Barton A. Bixenstine, MA'76, PhD'77, is listed in the most recent publication of *The Best Lawyers in America*. He is a partner at the Cleveland office of Ulmer & Berne, where he is a certified specialist in employment and labor law with 20 years of experience. He also specializes in issues involving statistical analysis.

Bette L. Warren, PhD'76, is a professor of mathematics and head of the department at Eastern Michigan University in Ypsilanti. She has been named governor of the Michigan section of the Mathematical Association of America for a three-year term. Warren lives in Ypsilanti.

The École Normale Supérieure of Paris has appointed **Paul Smolensky**, MS'77, PhD'81, to an International Blaise Pascal Research Chair for the academic year 2008-09. The chair is named after the 17th century mathematician, physicist and religious philosopher. Smolensky will spend the year in Paris conducting research and consulting with colleagues in an array of fields. He is Krieger-Eisenhower Professor of Cognitive Science at Johns Hopkins University in Baltimore, Md.

George E. Lewis, BA'78, MA'83, teaches math at a private school in Providence, R.I.

1980s

Antonia "Toni" Wilson Bluher, MS'83, is a senior cryptologic mathematician at the National Security Agency in Simpsonville, Md. She researches number theory, cryptography, and polynomials over finite fields. She is married to Greg Bluher and has three teenage sons. Her hobbies include running and playing tennis.

Michele LeBlanc, BS'86, PhD'00, is an associate professor and the Nena Amundson Professor of Biomechanics at California Lutheran University in Thousand Oaks, Calif. She lives in Newbury Park, Calif.

1990s

"After living nearly 10 years in the eastern United States, my family and I relocated to Bloomington, Ind., about three years ago. Thank you, Bill Cook! [LLD'93]" writes **Esther M. Brooks-Asplund**, BA/BS'94, an I-Woman who lettered in cross country and track and field. "The sweet memories of the significant people who were a part of my undergraduate life are now as vivid as ever and a part of my daily life. Nearly two years ago,

(continued on page 8)

Awards

(continued from page 3)

Rhodes (Cora B. Hennel Memorial Scholarship); Aaron Daniel Cantrell (Rainard Benton Robbins Prize); Elizabeth Ann Adams, Stephanie Ann Lampe, Elizabeth Haugh Oates, and Jennifer Sue Trueblood (Marie S. Wilcox Scholarship); Nada Omer (M118 Undergraduate Intern Award)

2008: Matt Walter (Thelma Abell Prize); Daniel Vincent Barron, Daniel Joseph Salvat (Cora B. Hennel Memorial Scholarship); Joseph Ivan Pacold (Rainard Benton Robbins Prize); Sibo Lin, Joseph Ivan Pacold (Marie S. Wilcox Scholarship)

Graduate Awards

David A. Rothrock Mathematics Fellowship Awards: (2007) Catherine Erbes, James Ferris, Joshua Gottemoller, Jennifer Hobbs, Paul Hong, Steven Morrow, Kelly Steinmetz, Christina Tone, Trent Tormoehlen, and Jonathan Yazinski; (2008) Holly Attenborough, Greg Chadwick, Qingshan Chen, Nathan Druivenga, Matthew Drury, Christian Hoffland, Jillian Paulen, Peter Rankenburg, Eric Schedler, Christopher Thornhill, Jennifer Trueblood, and Shantia Yarahmadian

Robert E. Weber Memorial Award: (2007) Tuyen Trung Truong, Justin Young, Michael Gelantalis (honorary mention), and Robert Niichel (honorary mention); (2008) Khek Lun Harold Chao, Honghu Liu (honorary mention), Jacob Magnusson (honorary mention), Mustafa Sengul (honorary mention), and Yuecheng Zhu (honorary mention)

James P. Williams Memorial Award: (2007) Zhen Huan, Jayampathy Ratnayake, Tuyen Trung Truong, Andres Contreras (honorary mention), and Toan Nguyen (honorary mention); (2008) Khek Lun Harold Chao, Jacob Magnusson, Honghu Liu (honorary mention), Mustafa Sengul (honorary mention), and Ihsan Topaloglu (honorary mention)

William B. Wilcox Mathematics Award (2007)Michael Bateman, Jan-Li Lin, Cornelia Van Cott, and Chunlai Zhou; (2008) Jung-Miao Kuo, Peter Mester, Toan Nguyen, Tuyen Truong, and Jonathan Yazinski

Hazel King Thompson Fellowship and College of Arts and Sciences Graduate Fellowship: (2007) William Siler, Tuyen Trung Truong, and Justin Young; (2008) Michael Bateman, Jacob Magnusson, Kevin Meek

McNair Fellowship: (2007 and 2008) Michelle E. Hackman

Vertical Integration of Research and Education in the Mathematical Sciences, VIGRE: (2007) Peter Connor, Jiho Kim, Kevin Li, Justin Mazur, Peter Rankenburg, Rebecca Swanson, Christopher Thornhill, and Jonathan Yazinski

Glenn Schober Memorial Travel Awards: (2007) Wael Abu-Shammala, Alexander Basyrov, Michael Bateman, Jennifer Franko, Tobias Hagge, Yun-Su Kim, Bongsuk Kwon, Chung-Min Lee, Jayoung Nam, Tien-Shieh Shiue, Tuyen Trung Truong, Shantia Yarahmadian, and Masoud Yari; (2008) Kevin Foster, Jayampathy Ratnayake, Yukie Goto, Chun-Yen Shen, William Holmes, Kelly Steinmetz, Jung-Miao Kuo, Cornelia Van Cott, Rob O'Connell, and Saeid Yasamin

Joseph & Frances Morgan Swain Fellowship: (2008) Justin Young

J. Steward and Dagmar K. Riley Graduate Fellowship: (2008) Cornelia Van Cott

M118 Undergraduate Intern Award: (2008) Dan Lee

University Graduate Scholar Fellowship: (2008) Daniel Gabilondo, Pere Jackson, Arnulfo Perez

Women in Science Fellowship: (2008) Jennifer Trueblood

Alumni notebook

(continued from page 3)

I left corporate America and started my own freelance medical-writing business, which I do on a very part-time basis. The majority of my time is spent managing my three young children (John, Michael, and Anna), which is similar to my previous job, but they are much younger and cuter! All friends are welcome to visit when in town!"

In January 2008, **Scott E. Peck**, BA'95, BA'96, JD'99, was made a partner at the Law firm Baker & Daniels, Indianapolis. A member of the firm since 1999, he works in the public finance group. In addition to his law degree, Peck received bachelor of arts degrees in English and in Mathematics from IU. He lives in Brownsburg, Ind.

Timothy K. Lance, MA'99, is an assistant professor of mathematics at Francis Marion University in Florence, S.C.

2000s

Dany R. Guerendo, MA'00, writes that he has received a North Carolina real-estate broker license.

Rebecca A. Ellies, BS'02, MAT'06, is an adjunct faculty member in the mathematics department at IU Bloomington and a private math tutor. Her husband, Jonathan M. Dilger, BS'03, is the project leader for the explosives-detection group at the Naval Surface Warfare Center in Crane, Ind. The couple was married in 2006 and lives in Bloomington.

Sarah A. Meyer, BA'05, writes, "I am coaching the girls' distance track team at Perry Meridian High School in Indianapolis, where I also teach math. I recently ran my first marathon in 3:18."

Saumya Verma, BS'05, of Fort Wayne, Ind., is a sales representative for Dow AgroSciences. Her territory is Virginia, Delaware, Maryland, and eastern West Virginia, where she creates awareness for the company's specialty herbicides, insecticides, and fungicides. Verma joined Dow AgroSciences in 2006 as a sales trainee.

Joshua M. Grayson, BM/BS'06, writes that he is starting a five-year PhD program in musicology at the University of Southern California, where he is the recipient of a prestigious Provost Fellowship from the university. The fellowship provides full tuition and a living stipend. Grayson lives in Los Angeles.

Amy L. Hoffman, BS/BA'06, is a student in the IU School of Medicine in Indianapolis. While attending IU Bloomington, she earned bachelor of science degrees in chemistry, mathematics, and biology, as well as a bachelor of arts degree in Germanic studies. Hoffman lives in Carmel, Ind.

Allison L. John, BA'06, teaches math at Parkway South High School in Ballwin, Mo., near St. Louis. She lives in Manchester, Mo.

Eric N. Wilson, PhD'06, is an assistant professor of mathematics at Covenant College in Georgia. His research concentrates on the study of manifolds and their relationship to classical lens spaces. He has also taught at IUB and Illinois Wesleyan University. Wilson lives in Flintsone, Ga.

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