College of Arts & Sciences Mathematics

Department Newsletter

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UNIVERSITY OF KENTUCKY College of Arts and Sciences

Letter From The Chair

Greetings to alumni and friends of the UK Mathematics Department! I appreciate your continued support of our efforts in teaching, research, and outreach to the Commonwealth of Kentucky.

Our faculty continues to sustain UK's national prominence in research, serve the mathematical community, and support the teaching of mathematics throughout the Commonwealth. Faculty member **Uwe Nagel** will spend 2006-07 as a New Directions Visiting Professor at the Institute for Mathematics and its Applications (IMA) at the University of Minnesota. Professor Nagel will participate in the IMA's special year on Applications of Algebraic Geometry. Faculty member **Peter Hislop**, who held UK's prestigious University Research Professorship in 2004-05, co-organized an international workshop at the University of Kentucky and a twoweek Pan-American Advanced Studies Institute (PASI) on Analysis and Probability in Quantum Physics together with



South American colleagues at the Catholic University of Chile in Santiago, Chile. Mathematics Outreach Professor Richard Millman received a \$1.8 million grant from the National Science Foundation to enhance mathematics teaching in Kentucky's middle schools and high schools. You can read more about our faculty's activities and accomplishments in what follows. You can also read about the solution of an important open problem in discrete and computational geometry by second-year graduate student **Carlos Nicolas**.

This year we welcome **Alan Demlow** and **Heide Glüsing-Lüerssen** to our faculty. Alan studies the solution of partial differential equations by finite element methods and Heidi is a senior researcher in algebraic coding theory. We celebrated the thirty-six year career of **Ron Gariepy** in a retirement conference held in May 2006.

This year is also a milestone for the Department's efforts to support outstanding faculty with the generous assistance of our alumni and friends. **John Lewis** completed a threeyear term as Ralph E. and Norma L. Edwards Professor of Mathematics, thanks to a generous gift from Mrs. Norma Edwards. John was awarded the Edwards Professorship in honor of his outstanding work in the field of partial differential equations. **Richard Ehrenborg** completed his term as the Wimberly C. and Betty J. Royster Professor of Mathematics; you can read more about Richard's accomplishments in the focus article that follows. Endowed professorships such as the Edwards and Royster Named Professorships are an important means to support and retain accomplished researchers such as Professors Lewis and Ehrenborg.

Through the generosity of Major James C. Eaves Jr., and Mrs. Mary H. Eaves, the University of Kentucky Mathematics department has a new endowed scholarship for undergraduate mathematics majors. The J.C. Eaves Endowed Scholarship in Mathematics honors the memory of Professor J.C. Eaves, former head of the Department of Mathematics and Astronomy from 1952 to 1963 and full professor until 1967. You can read more about the Eaves Scholarship and its first recipients in our undergraduate news section, and read alumnus Phil Brashear's reminisces about Professor Eaves in our alumni news section.

Through a generous gift of **Cliff Swauger's** wife and children, the Department of Mathematics has established the Clifford J. Swauger, Jr., Summer Graduate Fellowship. The department will award one or more summer research fellowships each year to graduate students pursuing the doctoral degree. Summer support will enable qualified graduate students to pursue thesis research, attend conferences and workshops, and pursue other activities related to their graduate training. Cliff served for many years as Associate Dean for Finance and Administration in the College of Arts and Sciences. He retired from this position in August 2005.

The University of Kentucky received a \$1.7 milion dollar gift from the estate of Max Steckler to create the Max Steckler Fellowship fund for graduate students. Thanks to the generous gift, six Mathematics graduate students will receive Steckler fellowships for the coming year.

This past year has seen significant changes in the Mathematics department staff. Lyn LeMieux is completing her first full year as Administrative Assistant to the Chair, succeeding Sandra Allen who retired from this position in 2005 after many years of service. Elizabeth Domene, the department's Front Office Assistant, retired in June 2006 after over 20 years of service to the University of Kentucky. Cecilia Grugin, staff assistant to the Director of Graduate Studies, took a position in the College of Education. Shirley Barnard, our accounts clerk, took a position in the College of Public Health. We are grateful to Cecilia, Elizabeth and Shirley for their service to the department and wish them all the best. Sheri Rhine is our new staff assistant to the Director of Graduate Studies, and Tammy Medaris is our new accounts clerk. We are grateful for Lyn's good service and are very pleased to welcome Sheri and Tammy to the Department.

The continuing support of our alumni and friends gives our department the margin of excellence which allows us to provide better instruction for our students and greater support for our faculty. I hope that you will enjoy the newsletter, take pride with us in the achievements of our faculty and students, and keep in touch with us!

Richard Carey chair@ms.uky.edu

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Cover: Richard Ehrenborg, Royster Professor of Mathematics

Faculty News

New Faculty

Alan Demlow, a numerical analyst who received his doctorate from Cornell University in 2002, will join the faculty as a tenure-track assistant professor in fall 2006. After his graduation from Cornell, Dr. Demlow was a visiting assistant professor at Cornell in 2002-2003 and a National Science Foundation Postdoctoral Fellow, Research Associate, and Guest Scientist at the University of Freiburg in Germany from 2003 to 2006. Dr. Demlow studies finite element methods for the numerical solution of partial differential equations.

Heide Glüsing-Lüerssen, a specialist in algebraic coding theory, will join our faculty as a tenure-track assistant professor in the spring of 2006. She received her doctorate from the University of Bremen in 1991 and her Habilitation from the University of Oldenburg. An accomplished senior scientist with over forty research publications, Dr. Gluesing-Luerssen is also an associate editor for the SIAM Journal on Control and Optimization.

Retirements

Professor Ronald Gariepy retired last spring after thirty-six years of service. A research conference and dinner with keynote speakers and longtime colleagues Robert Jensen (Loyola University of Chicago), William Ziemer (Indiana University), and Emmanuelle DiBenedetto (Vanderbilt University) was held in Ron's honor on May 5, 2006.

Ron joined the Department of Mathematics as an assistant professor in 1970, and has been a full professor since 1981. Ron's research has included work in geometric measure theory, elliptic and parabolic differential equations, variational problems, and nonlinear elliptic equations. During his tenure here he graduated three doctoral students, Hi-Jun Choe, Barbara Hatfield, and John Tolle. He is the co-author of the widely cited research monograph Measure Theory and Fine Properties of Functions with longtime collaborator L. C. Evans (University of California at Berkeley) and also co-authored the advanced text Modern Real Analysis with William Ziemer.

A friend thinks of an integer between 0 and 15. You are allowed to ask seven yes-or-no questions in order to find out what number your friend has in mind, and your friend is allowed to tell at most one lie. Can you do it?

This past spring, Royster Professor Richard Ehrenborg posed this challenge to his undergraduate Applied Probability class and asked for a student volunteer to think of a number, asked him seven questions, and instructed him to lie once. Using a sevencard "Mathematical Lie Detector," Richard was able not only to guess the number but also to tell the student which of his seven answers was a lie. With characteristic energy, good humor, and enthusiasm, he had introduced his students to the Hamming code, a seven-bit code which uses four data bits (which code the numbers 0 to 15) and three check bits to transmit data correctly even if one of the four bits is not transmitted correctly. (You can make your own "Mathematical Lie Detector" and find out more about Hamming codes by follow-

ing the links at the end of this article.

Described by his colleagues as "a wonderful and playful mathematician," Richard brings the same enthusiasm and gifts to his research that he brings into the classroom. On the strength of his research accomplishments since his arrival here in 2000, he became the first Royster Professor of Mathematics in July of 2004. The Royster named professorship, endowed by Wimberly and Betty Royster, recognizes faculty at the Associate Professor level who have made outstanding contributions to research. Richard held the position until his promotion to the rank of Full Professor in July of 2006.

Richard is best-known for his contributions to polytope theory. A polytope is the generalization to any dimension of the familiar plane polygons and three-dimensional regular polyhedra which have been studied since antiquity. Today, polytope theory plays a crucial role in active areas of modern mathematics such as linear pro-



Faculty News

Conference in Honor of Jim Beidleman

On September 8, 9 and 10 of 2006 a symposium in honor of Professor James Beidleman was held at the Radisson Plaza Hotel in Lexington. The symposium marked Jim's 70th birthday, honored his many achievements, and celebrated his friendship.

Departing Faculty

Vassily Gorbounov has accepted a chaired professorship at the University of Aberdeen in Scotland. Vassily joined the faculty as an assistant professor in 1995, was promoted to associate professor in 1995, and became a full professor in 2005. Dur-



ing his tenure here he achieved international prominence for pioneering mathematical work with close connections to quantum field theory and string theory. He graduated one doctoral student, Daniel Pinzon. Ren-Cang Li has accepted a tenured professorship at the University of Texas at Arlington. Rencang came to the University of Kentucky as an assistant professor in 1995. He was promoted to Associate Professor in 2001. During his tenure at the University of Kentucky he was also a consultant to Hewlett-Packard, helping to develop software for the HP's Itanium chip and for HP calculators.

Promotions

Richard Ehrenborg was promoted to full

gramming, combinatorial optimization, and computational geometry. Richard and his collaborators have associated algebraic structures to polyhedra in order to bring powerful methods of Hopf algebras to bear on the study of polytopes.

Richard's research interests have always gone hand-in-hand with effective teaching and mentoring. While he was an H. C. Wang Assistant Professor at Cornell University, he co-directed a very successful NSF-funded summer Research Experiences for Undergraduates (REU) program. Working with summer REU fellow Michael Levin and colleague Margaret Readdy, Richard co-authored a paper, "A Probabilistic Interpretation of the Descent Statistic" which later won Levin Honorable Mention in the AMS-MAA-SIAM Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. In 2005, Richard visited the Mittag-Leffler Institute in Sweden for a one-half year special program in Algebraic Combinatorics. Richard arranged for his current

professor beginning July 2006. You can read more about Professor Ehrenborg and his research in this section's focus article.

Lectures Given

In May 2006, Alberto Corso gave an invited lecture at the International Conference on Commutative Geometry and its Interactions with Algebraic Geometry at the Centre International des Rencontres Mathématiques in Luminy, France. Carl Lee gave an invited lecture at a conference on Convex Sets and their Applications at the Banff International Research Station in March 2006. Peter Perry gave an invited plenary lecture at the sixtieth birthday conference for Barry Simon at Caltech in March of 2006. Margaret Readdy gave a lecture in

doctoral student, Michael Slone, to visit the Institute as well and to meet international leaders in his field of study.

Richard received his doctorate from Massachusetts Institute of Technology in 1993 under the supervision of Gian-Carlo Rota. Richard will return to MIT as a visiting scholar during a well-deserved sabbatical year in 2006-2007.

For Further Information:

Richard Ehrenborg. Decoding the Hamming Code. Math Horizons (special issue on codes, cryptography, and national security) 13 (2006), 16-17. You can obtain the paper, seven question cards, and the instructions you need to make a mathematical lie detector from Richard's website, www.math.uky.edu/~jrge/. Look under Richard's publications in the "Miscellaneous" category or use your browser to search for the text "Hamming code." You can also read about the history and mathematical foundation of Hamming codes at www.wikipedia.com by searching on "Hamming Code," or by viewing the MathWorld article on Hamming codes at mathworld.wolfram.com/HammingCode.html.

Faculty News

June 2006 at the International Conference on Formal Power Series and Algebraic Combinatorics in San Diego, June 2006. Zhongwei Shen gave a short course at the University of Missouri-Columbia in March 2006. Changyou Wang gave a ten-lecture short course entitled "An Introduction to Harmonic Maps" in a summer graduate school of the University of Sciences and Technology in Hefei, China.

Conferences Organized

Peter Hislop co-organized a Worskhop on Transport Properties of Random Schrodinger Operators at the University of Kentucky in March 2006, with support from the University of Kentucky and the Institute for Mathematics and its Applications. Hislop also chaired the organizing committee for the Pan-American Studies Institute conference Analysis and Probability in Quantum Mechanics in Santiago, Chile in summer 2006. Current graduate students Christopher Frayer and Julie Miker were among the student participants. Robert Molzon and Daniella Puzzello are organizing a conference on Random Matching and Pattern Formation co-funded by the Mathematical Sciences Research Institute (MSRI, Berkeley) and the Institute for Mathematics and its Applications (IMA). The conference will take place in October 2006. The University of Kentucky is an institutional member of MSRI and the IMA. Alberto Corso co-organized the Midwest Algebra, Geometry and their Interactions (MAGIC) conference at Notre Dame in October 2005, sponsored by NSF, IMA and MSRI. There were 140 participants and an introductory public lecture by Bernd Sturmfels. Corso is also co-organizing a workshop on Integral Closure, Multiplier Ideals, and Cores at the American Institute of Mathematics (AIM) in December 2006. AIM is a privately-funded research institute based in Palo Alto, California which awards funding for research conferences on a highly competitive basis.

Visiting Positions 2005-06

Changyou Wang visited the Mathematical Sciences Research Institute in Berkeley and the Courant Institute of Mathematical Sciences in Fall 2005. Peter Hislop was Visiting Professor, Universite de Cergy-Pointoise, France, in June 2005. Zhongwei Shen visited Lanzhou University in China, May 2006, and University of Paris at Orsay, June 2006. Sung-Ha Kang visited the IMA in spring 2006 as a participant in the IMA's Thematic Year on Imaging.

Visiting Positions 2006-07

Uwe Nagel will hold an IMA New Directions Visiting Professorship at the Institute for Mathematics and its Applications (IMA) for 2006-07. Professor Nagel will participate in the IMA's special year on Applications of Algebraic Geometry

Faculty Visitors 2005-06

Professor Tong Kun Chang from Yonsei University, Seoul, Republic of Korea, visited John Lewis; Dr. Olaf Post (University of Aachen), visited Peter Hislop; Dr. Guoce Xin (Visiting from Brandeis University), discrete mathematics, visited Carl Lee, Richard Ehrenborg, and Margaret Readdy; Dr. Xiang Gao from Department of Mechanical Engineering, Brigham Young University, visited Chi-Sing Man doing work in Orientation Imaging Microscopy.

Faculty Visitors 2006-07

Dr. Siu-Hung Tang will visit UK to work with faculty members Peter Hislop and Peter Perry. Tang is supported by Hislop and Perry's NSF grant and the department. Dr. Cornelia Yuen will hold a renewable one-year UK Postdoctoral Fellowship for Women in Underrepresented Areas and work with Alberto Corso. Dr. Edwin O'Shea will visit Carl Lee in discrete math. O'Shea received his doctorate from the University of Washington in 2006. He works in discrete optimization. Professor Valdimir Yakovlevich Eyderman, an anaylst from Moscow State Civil Engineering University, will be working with Jim Brennan. UK graduate and Professor Jakayla Robbins from the University of Montana will serve as Director of Service Courses and work with Carl Lee.

Sabbaticals and Research Leaves

Larry Harris took a sabbatical in Fall 2005 to visit David Shoikhet (Karmiel, Israel). James Beidleman is spending a sabbatical semester working on problems in the theory of finite groups. Chi-Sing Man is taking a sabbatical semester to finish a monograph on thermodynamics with James Serrin (University of Minnesota). Richard Ehrenborg and Margaret Readdy are on sabbatical leave at MIT.

Changyou Wang is a fall 2006 general member at MSRI for the special program "Geometric Evolution Equations". Qiang Ye is spending a sabbatical semester in Lexington.

Honors and Awards

Qiang Ye received the Marcel Neuts prize for the best paper in stochastic models. Marian Anton received the Gheorge Lazar Prize of the Romanian Academy of Sciecnes for his contributions to algebraic Ktheory and its applications.

Mathematics Outreach

For many years, the Department of Mathematics has been involved in outreach efforts to help Kentucky schools teach mathematics more effectively. Due to these efforts and those of colleagues throughout the University, the University received a \$22 million grant from the National Science Foundation to establish the Appalachian Mathematics and Science Partnership (AMSP) in 2002. As a part of the AMSP grant, the University of Kentucky committed to hire an Outreach Professor of Mathematics at the senior faculty level.

Richard Millman came to the University of Kentucky in 2004 as our first Outreach Professor of Mathematics. Millman supports ongoing efforts of the Department of Mathematics to enhance pre-service and in-service training of PreK-12 mathematics teachers, coordinate outreach activities to public schools, and advocate the cause of Mathematics Education throughout the Commonwealth of Kentucky. His mathematical area is differential geometry.

This past year, Millman obtained a \$1.8 million grant from the National Science Foundation to enrich mathematical skills and knowledge of middle and high school students in Bath and Powell counties in Eastern Kentucky. The grant, known as Algebra Cubed, will fund 10 science, math or engineering graduate student fellows each year for three years as math specialists in the counties, and will also fund the teachers who will serve as mentors to the fellows.

Bath and Powell counties were chosen for the grant because of their low percentage of high school graduates that go on to earn bachelor's degrees and the quality and desire of teachers and administrators for improved mathematics learning in the schools. Bath County had a 59 percent high school graduation rate in 2000 and a 10 percent bachelor's degree rate in the same year. Powell County had a 56 percent high school graduation rate in 2000 and a 6.5 percent bachelor's degree rate in the same year. The counties fall behind Kentucky's high school graduation rate which was 74 percent in 2000 with 17 percent earning a bachelor's degree.

"Algebra is a subject that enables students to succeed or can limit their career horizons," says Millman. "Through the partnership of schools and the university, Algebra Cubed will excite students about mathematics and its applications and will open further opportunities for them." Graduate students will work on-site with teachers and students 10 hours a week.

"To receive a grant of this amount in math is absolutely wonderful for our students, community and teachers," said Nancy Hutchinson, Bath County Superintendent. "This grant is going to bring direct instruction of not only knowledge, but applied concepts and will allow our students, faculty and staff to have a collaborative partner with UK in making math real to our students' everyday lives."

Powell County Superintendent Lonnie Morris agrees that the grant will open many doors for his students. "We are honored that we were selected to participate," Morris said. "We are very appreciative of Dr. Millman and his efforts to enhance math in Powell County."

Other principal investigators on the grant include G. T. Lineberry, professor of Mining Engineering; Xin Ma, professor of Curriculum and Instruction in the College of Education; Jeff Osborn, professor in the Department of Biology; Paul Prater, principal of Bath County High School.

For further information on UK's Mathematics Outreach activities, you can visit the AMSP website at www.appalmsp.org. To find out more about the Algebra Cubed project, please see the project website at www.math.uky.edu/algebracubed. Professor Millman's home page may be found at www.math.uky.edu/~millman.



Mathematics Outreach CATSBusters



Headed by Mathematics faculty members Paul Eakin, Ken Kubota and Carl Eberhart, the CATS-Busters project aims at improving the advanced math skills of Kentucky's entering college freshmen in order to increase Kentucky's competitiveness in the science and engineering disciplines that will drive the nation's 21st century economy. Exemplifying the problem: in fall 2005, UK placed 433 freshmen in remedial algebra because they did not know high school Algebra I; 1,900 were placed in college algebra because they hadn't mastered Algebra II; 930 were placed in business calculus, meaning they are not on track toward any science or engineering career. The CATSBusters project partners UK with the National Science Foundation, the U.S. Department of Education, and the Kentucky Department of Education to develop specific mathematics courses to prepare students for business calculus and scientific calculus. This program is providing professional development currently to 25 teachers in 11 counties via weekly two-hour online sessions, with teachers using electronic pens that write on computer monitors.

The CATSBusters program will increase high school and college students' proficiency in mathematics as a critical step toward providing Kentucky with scientists, engineers, mathematics and science teachers to support the economy of the 21st century. The project will develop new instructional technologies and new approaches to local and distance learning with particular emphasis on teacher support and professional development.

By the end of summer 2006 approximately 250 Eastern Kentucky math and science teachers will have received the equipment and training to allow long-term participation in the project. This will be followed in academic year 2006-07 by courses, seminars, and workshops, through UK and other institutions, which will include access to college-level mathematics for advanced students of these teachers.

The CATSBusters program was designated one of the Commonwealth Collaboratives by UK President Lee Todd. The designation included a \$10,000 internal award to enhance the program. Co-sponsors of the program include the National Science Foundation through the Appalachian Mathematics and Science Partnership, the U. S. Department of Education through the Morgan County Technology Challenge Grant, the Kentucky Department of Education through its Online Formative Assessment Technology Development contract, and the University of Kentucky through the Institute for Academic Partnerships.

Mathematics Outreach ACCLAIM Doctoral Program

This past spring, Carl Lee taught his first online course on the History of Mathematics to doctoral students in the ACCLAIM doctoral program in Mathematics Education. These students are scattered from Missouri and Arkansas to West Virginia and North Carolina, and teach in high schools, two-year colleges, and four-year colleges. Carl meets synchronously with students every other week using the software Centra, which facilitates discussion (hearing each other's voices, seeing each other's faces) and sharing programs and resources on our respective computers with each other. Jennifer Eli, a doctoral student in Mathematics Education at UK, provides invaluable aid and assistance.

The students are enrolled in an inter-institutional doctoral program in Mathematics Education through the ACCLAIM program (Appalachian Collaborative Center for Learning, Assessment, and Instruction in Mathematics), one of NSF's centers for Teaching and Learning. The University of Tennessee is the lead institution and the University of Louisville, University of Kentucky, Ohio University, Marshall University, and the University of West Virginia are institutional partners.

The current cohort of students began their studies in summer 2004. They take courses together in the summers at one of the partner institutions, and take the remaining courses online during the academic year. Most of the twelve students in the first cohort, who began in 2002, are working on their doctoral dissertations. The ACCLAIM doctoral program is now recruiting for its third cohort, to begin studies in summer 2007. Information can be found on the AC-CLAIM website, www.acclaim-math.org.

Carl also co-organized a symposium on Distance Learning and Teaching at the Morgan County Center in October 2005 which included participants from Missouri, Michigan, and Central Appalachia.

Conferences and Lectures

Alumni in the region are always welcome to attend the Department's special lecture series as well as our ongoing seminars and colloquia. Please visit, www.math.uky.edu, for up-to-date information and details on department activities.

Fifth Annual Hayden-Howard Lecture in Mathematics

Professor Fanghua Lin, an internationally known researcher in the fields of partial differential equations, geometric analysis, and applied mathematics, gave the fifth Hayden-Howard lecture on "Conserved Quantities and Analysis on Multiscale Problems" this past spring semester. Lin is J. Silver Professor of Mathematics at the Courant Institute of Mathematical Sciences. Professor Lin, who also gave an invited lecture at the International Congress of Mathematicians in 1990, has been a member of the American Academy of Arts and Sciences since 2004.

Sixth Annual Hayden-Howard Lecture in Mathematics

The sixth Annual Hayden-Howard Lecture in Mathematics will be given April 18, 2007, by Professor John Neuberger, Regents Professor at the University of North Texas. He previously taught at the Illinois Institute of Technology, the University of Tennessee, and Emory University. He is a past recipient of the prestigious Sloan fellowship.

Van Winter Memorial Lecture in Mathematical Physics, March 2007

The Van Winter Memorial lecture in Mathematical Physics honors the memory of Professor Clasine Van Winter, who held a joint appointment in the department of Mathematics and the Department of Physics and Astronomy. On March 20, 2007, Professor Barry Simon, IBM Professor of Mathematics and Theoretical Physics, Caltech, will deliver the sixth Van Winter memorial lecture. Simon is the author of over 300 mathematics research papers, 14 monographs, and 47 review articles. His classic work with Mike Reed, Methods of Modern Mathematical Physics, in four volumes, has been a standard text and reference for workers in Mathematical Physics for nearly thirty years. Volume IV of this series included a discussion of Professor Van Winter's pioneering work on the mathematical foundations of quantum theory and was instrumental in making her work known to a wide audience of researchers worldwide.

Professor Simon's work has touched almost every area of mathematical quantum mechanics. Among many other honors, Professor Simon is a Fellow of the American Academy of Arts and Sciences and a past invited speaker at the International Congress of Mathematicians.



Graduate Program News

By any standard, Carlos Nicolas is a remarkable graduate student. This past year, as a second-year graduate student, Nicolas cracked an unsolved problem posed by the Hungarian-born mathematician Paul Erdös (1913-1996), who traveled the world visiting mathematicians and working with them. During his life, Erdos posed a number of hard mathematical problems which became known in the mathematical community as "Erdös problems" and have proved very challenging to solve.

On his own initiative, Carlos solved one of the Erdös problems, wrote a research paper discussing his solution, and submitted his paper to the journal Discrete and Computational Geometry. He is the first graduate student in our department to have a single-authored paper accepted in a leading research journal in the second year of graduate study. The paper, "Empty convex hexagons in planar point sets" proves the following theorem. Every set P of points in general position in the plane with sufficiently many points contains six points forming the vertices of a convex hexagon that contain no other points of P.

Carlos received a Kentucky Opportunity Fellowship for this academic year in recognition for his outstanding achievement.

Further Reading:

On Paul Erdös: The Man Who Loved Only Numbers: The Story of Paul Erdos and the Search for Mathematical Truth by Paul Hoffman. Hyperion Books, New York, 1998.



Steckler Fellowships

The University of Kentucky received a \$1.7 million dollar gift from the estate of Max Steckler to create the Max Steckler Fellowship fund for graduate fellowships. The Steckler bequest funds 42 graduate fellowships in seven academic departments each year. For 2006-07, six Mathematics graduate students will receive Steckler fellowships in addition to their teaching assistantships: Scott Godefroy, Chris Frayer, Joel Kilty, Sonja Petrovic, Michael Slone, and Erik Stokes. These fellowships provide a yearly award of \$3,000 to outstanding graduate students.

Algebra Cubed Fellows

The following graduate students (from Mathematics unless otherwise indicated) will serve as Algebra Cubed fellows, working with teachers in Bath and Powell counties in Kentucky to improve the teaching of middle school and high school mathematics: Rachelle Bouchat, Julia Chifman, Amy Heilman, Andy Kirby, Erin Militzer, Josh Roberts, Matt Wells, Audrey Brock (Statistics), Julie Gibbs (Mechanical Engineering), and Kenneth MacPherson (Earth and Environmental Sciences), Sara Golebiewski and Jennifer Ferguson. Please see pg. 7 for the focus article on Professor Richard Millman and the Algebra Cubed program.

Swauger Summer Fellowships

Through the generosity of Cliff Swager's wife and children, a new fund will be established to endow summer fellowships for Mathematics graduate students. This fund will provide summer support for graduate students pursuing the doctoral degree. Please see the Chair's letter for more details about this new program.

Graduate Program News

The Edgar Enochs Fellowship

The Edgar Enochs fellowship was awarded to Erik Stokes (*pictured right*), a doctoral student in algebra who is working with Uwe Nagel. The award, established in honor of Professor Edgar Enochs by many of his friends and doctoral graduates, is awarded each year to an outstanding doctoral student in the field of Algebra.

Wimberly C. Royster Outstanding Teaching Assistant Award

The Wimberly C. Royster Outstanding Teaching Assistant Award was given to

Rachelle Bouchat (pictured far right) and Sonja Petrovic (pictured right). The Royster Award honors graduate students who have completed qualifying examinations and have been teaching assistants for no more than eight semesters. The Royster Award is made possible through the generosity of Wimberly and Betty Royster.





Doctoral Degrees Awarded

The following students received doctoral degrees during the academic year 2005-2006: James Money (a student of Sung-Ha Kang), Todorka Nedeva (a student of Edgar Enochs), Daniel Pinzon (a student of Vassily Gorbounov), and Patrick Quillen (a student of Qiang Ye).

Master's Degrees Awarded

The following students received master's degrees in 2005-2006: Ran Bai, Thomas

Carlile, Pamela Connors, Charles Coulston, Dibyajyoti Deb, Jessica Farley, Phuoc Ho, Eric Kahn, Joel Kilty, Julie Miker, Erin Militzer, Carlos Nicolas, Joshua Roberts, Skyler Speakman, James Spilovoy, Joshua Strodtbeck, Daniel Wells, and Matthew Wells.

Undergraduate News

J. C. Eaves Endowed Scholarship in Mathematics

Thanks to the generosity of Major James C. Eaves Jr., and Mrs. Mary H. Eaves, the University of Kentucky Mathematics department has a new endowed scholarship for undergraduate mathematics majors. The J. C. Eaves Endowed Scholarship in Mathematics honors the memory of Professor J. C. Eaves, former head of the Department of Mathematics and Astronomy from 1952 to 1963 and full professor until 1967. The Eaves scholarships are awarded each year to graduates of high schools in the Commonwealth of Kentucky who are juniors or seniors majoring in Mathematics. Recipients are selected by scholarship committee appointed by the Dean of the College of Arts and Sciences. This year, three students were awarded the Eaves scholarship: Steven Reeves, Katherine Thompson, and Daniel Winterbottom.

AMSTEMM Program

The Department of Mathematics is an integral partner in UK's AMSTEMM (Appalachian and Minority Science, Technology, Engineering and Mathematics Majors) program to recruit, retain and graduate Appalachian and minority students in the science, technology, and engineering (STEM) disciplines. Mathematics faculty member Carl Eberhart is a co-principal investigator on the National Science Foundation grant that is funding this program. In June 2006, minority and Appalachian high school juniors attended a one-week program where they met UK faculty and staff, took Math preparation workshops, visited science and engineering laboratories, and toured the Toyota Motor and Manufacturing plant in Georgetown, Kentucky. Students also enjoyed the Woodsongs Old Time Radio Hour at the Kentucky Theatre in downtown Lexington. These recruits will be closely advised and mentored throughout their undergraduate years. You can learn more about the AM-STEMM program at the UK Web site www.uky.edu/AMSTEMM/



Undergraduate Lecture

Robin Hartshorne (Berkeley), *pictured*, gave an undergraduate talk on the History of Imaginary Numbers in April 2006. The talk was co-organized by Alberto Corso and Uwe Nagel.

Awards Day 2006

The Carolyn Bunyan Scholarship for outstanding undergraduates in mathematics was given to Rachel Dunnagan, Raymond Kremer, Ryan Mabry, and Ryan Davis.

The Robert B. Royster Award for 2006 was given to Alan Boucher. The Robert B. Royster Memorial Award is given to a graduating Mathematics senior who intends to go into teaching.

2005-06 Mathematics Graduates

The following students received undergraduate degrees in Mathematics in 2005-06; those marked with a (*) received Departmental Honors. Eric Anderson*, John Balbach, Alan Boucher, Talmage Brown*, Candice Cprek, James Grogan, Jeffrey Henken*, Adam Keach*, Chris Mattingly, Thomas Merrick, Jason Pridemore, and Joshua Slayton *.

2005-06 Mathematical Economics Graduates

The following students received undergraduate degrees in Mathematical Economics in 2005-06; those marked with a (*) received Departmental Honors. Christopher Clines, Candice Hartley, Shimar Keith, Yuri Kouriatnikov, Rupert Leslie III, Christopher Mattingly*, Bradley Mulhall, Ashley Ray*, Charles Reinsheld*, Jonathon Ross*, John Stone III*, and Lee Waddler*.

Alumni News



Phil Brashear graduated from the University of Kentucky with an A.B. in Education and a teaching major in Mathematics, in January 1962. Recently, Phil wrote us a long letter about his varied and interesting career since his graduation. Here is an excerpt from his letter:

I received an A.B. in Education (teaching major in math) in January 1962. As an undergraduate, the professors I remember best were Wimberly Royster, J.C. Eaves, and Sally Pence. After receiving a master's in math from Northwestern University in 1965, I joined the faculty at Eastern Kentucky University. While at Eastern, I took several graduate courses in Topology and Algebra at UK. In 1969-71, I was in the Ph.D. program at the University of Georgia, returning to Eastern with the intent of completing a dissertation in Topological Algebra (semigroup rings). However, I found other activities more interesting and became Associate Professor of Computer Science. After 20 years on the faculty at Eastern, I left the academic life in 1986 and entered the world of defense software contracting. I led the maintenance and enhancement of two Ada language test suites - one for testing conformance to the language standard and the other for assessing the performance of compilers and the generated code.

Since 1997, I've been with Electronic Data Systems (EDS) and am currently wearing two hats in an organization of about 1,000 team members working in various areas of support for state and federal government agencies. I'm the organizational Quality Assurance Leader (we assess the project teams' conformance to their defined processes) and one of four Organizational Quality Engineers (we lead the project teams' efforts to manage their work quantitatively, using Statistical Process Control techniques). I'm still teaching on a part-time basis in the Department of Computer Science at the University of Dayton.

While most of the class of '62 is retired by now, I'm looking forward to another four years or so of active professional employment (provided my mental faculties hold out). I have fond memories of the "old days" in McVey Hall.

Alumni News

Undergraduate Alumni News

Lee Gibson (BA, '98), *pictured right*, completed his dissertation on "The Number of Sites Visited by a Random Walk on an Infinite Graph" at Cornell University under the direction of Laurent Saloff-Coste in 2005. He is now an assistant professor at the University of Louisville.



Kathy Lewis (BA, '92), *pictured below*, graduated from the University of Kentucky with an



undergraduate degree in Mathematics. She received her doctorate from Purdue University under Carl Cowan. Kathy was promoted to the rank of associate professor at Morehead State University.

Dennis Strickler (BA, '73) retired in May 2005 after 31 years on the research staff in the Magnetic Fusion Energy program at Oak Ridge National Laboratory

Graduate Alumni News

Thomas Cheatham (a doctoral student of Edgar Enochs who received his degree in 1971) was acting Dean of the College of Basic and Applied Science at Middle Tennessee State University and has now been appointed Dean of the College of Basic and Applied Sciences.

Alina lacob (a 2005 doctoral student of Edgar Enochs) has five articles accepted for publication (including articles to appear in Communications in Algebra and the Proceedings of the Royal Society of Edinburgh) and has submitted four other articles.

Overtoun Jenda (a doctoral student of Edgar Enochs who

received his degree in 1981) has been appointed Associate Provost for Diversity and Multicultural Affairs at Auburn University.

Carl Lutzer (a doctoral student of Peter Hislop who received his degree in 2000) was granted tenure at Rochester Polytechnic Institute this year.

Robert Robertson (a doctoral student of Peter Hislop who received his degree in 1996) is Chair of the Mathematics and Computer Science Department and Associate Professor at Drury University in Springfield, Mo. Robert joined the faculty at Drury in 2001.

Helen Xiang, who received her doctoral degree in Materials Science and Engineering from the University of Kentucky in 2004 under the supervision of Mathematics faculty member Chi-Sing Man, was hired as Chief Metallurgical Engineer for the Testing and Engineering Division of Intertek ETL Entela in Grand Rapids, Mich. The Intertek Group is an international testing, inspection and certification organization which operates 273 laboratories in 100 countries throughout the world. Elizabeth Yanik, *pictured below*, (a doctoral student of Graeme Fairweather who received her degree in 1982) received the 2004 Presidential Award for Excellence in Science, Math-

ematics, and Engineering Mentoring. The award was announced in May 2005. She is considered passionate а teacher who directs and sustains a half dozen mentoring programs at Emporia State Univer-



sity where she has been a full professor since 1999. Her MASTER IT program is a week-long residential summer program engaging girls (grades 8 and 9) in mathematics and science activities on the ESU campus. Her Interdisciplinary Science and Mathematics provides ESU students with opportunities for early research experiences. Participants include students majoring in biological sciences, physical sciences, mathematics and computer science.

Please send notes for this section to:

Russell Brown Department of Mathematics University of Kentucky Lexington, KY 40506-0027

or to rbrown@uky.edu

College of Arts & Sciences Mathematics

Alumni News

Name
Degree(s)
Class Year(s)
Current Address
-Mail Address

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Please provide a brief statement of what you are doing and/or any recent changes. We will include your news in an upcoming edition of the *Mathematics Newsletter*. Updating your mailing and e-mail addresses enables us to communicate with you through future newsletters and other correspondence to Mathematics alumni.

> Mail to: Department of Mathematics 715 Patterson Office Tower University of Kentucky Campus Lexington, Kentucky 40506-0027

College of Arts & Sciences Mathematics

Department Contribution

Name	
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Enochs Scholarship Fund _______ Supports scholarships for graduate students who major in an algebra area.

Fellowship Fund Supports activites in the graduate program. Bunyan Scholarship Fund

Provides scholarship for the undergraduates in Mathematics and Mathematical Sciences.

Royster Teaching Assistant Award

Provides cash awards for teaching assistants who demonstrate outstanding performance in teaching and scholarship and, in addition, show research potential.

J.C. Eaves Scholarship Fund

Provides scholarship for junior and senior mathematics majors who graduated from Kentucky high schools.

Please send contributions, along with this form, to: Department of Mathematics 715 Patterson Office Tower University of Kentucky Campus Lexington, Kentucky 40506-0027





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