



UNIVERSITY OF KENTUCKY
COLLEGE OF ARTS & SCIENCES

DEPARTMENT OF
MATHEMATICS NEWSLETTER

A message from the chair

Dear Alumni and Friends of the University of Kentucky Department of Mathematics,

I am writing with news from the Department since the last newsletter in the winter of 2015.

On 1 July 2016, the promotion of Kate Ponto to Associate Professor with tenure was finalized. Ponto works in algebraic topology and has developed a new formulation of fixed point theory that has led to advances in this classical subject. Ponto earned her Ph.D. from the University of Chicago in 2007 and came to Kentucky in 2010. In addition to her outstanding research, Ponto has been instrumental in rebuilding Kentucky's topology group after a number of recent departures.

David Adams retired after a long career at Kentucky. Adams earned his Ph.D. in 1969 at the University of Minnesota with Norman Meyers and came to Kentucky in 1973. He is an expert in potential theory publishing 64 articles and monographs during his career. His articles include "A sharp inequality of J. Moser for higher order derivatives" which appeared in the *Annals of Mathematics* in 1988. He is also the co-author with Lars Hedberg of the monograph *Function Spaces and Potential Theory* which was published by Springer Verlag in the series Grundlehren der Mathematischen Wissenschaften in 1996.

Also departing is Michel Jabbour who left Kentucky for the École Polytechnique in Paris after spending two years on leave from Kentucky. Jabbour came to Kentucky in 2001 and is a specialist in continuum mechanics and the mathematics of materials. He recently collaborated with Chi-Sing Man of Kentucky and John Anthony of Kentucky's Chemistry Department on a project related to solar cells. We wish Jabbour well in his new position.

This fall we welcomed three new faculty to the Department as Lecturers: Rob Denomme who received his Ph.D. from UCLA in 2014, Nathan Druivenga who received his Ph.D. from the University of Iowa in 2016, and Katherine Paullin who received her Ph.D. from St. Louis University in 2015. Denomme is from Lexington and was my student in Calculus III while in high school. We are very pleased to welcome him back to the Department. In addition to his teaching duties, he has taken on the job of supervising our departmental tutoring center, the Mathskeller. Druivenga has extensive teaching

experience prior to his doctoral work and is assisting the coordinator for our largest course, Elementary Calculus. Paullin held a temporary position in the Department last year and is helping to supervise our teaching assistants in addition to her teaching duties.

Two faculty were honored within the University during the past year. Zhongwei Shen was named the College of Arts & Sciences Distinguished Professor for 2016-17 in recognition of achievements in teaching, research and service during his career. Shen earned his Ph.D. in Chicago in 1989 and came to Kentucky in 1995. His recent research is focused on the theory of homogenization for partial differential equations which provides a way to develop macroscopic models for materials from information about the fine scale structure of the material. Shen was also awarded a grant from the National Science Foundation to support his research and the work of his students. Shen will give a public lecture in the spring of 2017 and I encourage those of you in Lexington to join us for this event.

Qiang Ye was one of two faculty in the College to be named University Research Professor for 2016-17. More information about this honor and his recent research grant appear in an article later in this newsletter.

Our graduate program continues to thrive with twelve doctoral graduates over the past year. Highlights include Liam Solus who graduated in December of 2015 and was awarded a National Science Foundation Post-doctoral Research Fellowship which will support him during a post-doctoral position at Kungliga Tekniska Högskolan in Stockholm. The complete list of doctoral graduates appears below.

In the undergraduate program, we had thirty students graduate with a primary major in Mathematics in 2015-16 and an additional nineteen in the Mathematical Economics program that is joint with Economics. In addition, seven students earned a degree in the Secondary Mathematics program in the College of Education and a secondary major in Mathematics. A highlight among graduates is Robert Cass. Cass will begin graduate study in mathematics at Harvard University and was awarded an NSF Graduate Fellowship to support his studies.

It is an honor to work with our students and faculty and there is more good news than we can include in this newsletter. Please visit our **departmental website** for current news about the department. It is always a pleasure to hear from alumni and I encourage you to contact me by phone or email (russell.brown@uky.edu) or to drop by if you are in Lexington.

Sincerely,

Russell Brown

DONOR SUPPORTED SCHOLARSHIPS AND FUNDS

This has been a challenging year financially. These challenges have helped to highlight the importance of contributions from many generous friends of the Department that help to support our students and programs. The list below gives the various activities supported by your gifts.

I would be very happy to speak with you about the Department's needs. Gifts to the Mathematics Department Development Fund (**donate here**) are especially appreciated as this fund can be used to support departmental priorities across the full range of our activities.

The Mathematics Development Fund is available to support departmental activities including travel by graduate students to present their research, undergraduate research and outreach activities such as our Math Circle.

Undergraduate Funds

The Dr. J.C. Eaves Undergraduate Excellence Fund supports several activities for our undergraduate mathematics majors. These include inviting mathematicians to campus for lectures, supporting undergraduate research, and undergraduate teaching assistants.

The Dr. J.C. Eaves Scholarship provides support to undergraduate students who graduate from high schools in the Commonwealth of Kentucky with a preference for students from Muhlenberg, Taylor or Adair Counties.

The Sallie Pence Award is given to students who are studying to be mathematics teachers. The award usually supports a membership in the National Council of Teachers of Mathematics.

The Carolyn S. Bunyan Scholarship is awarded to an outstanding undergraduate student each year.

Graduate Funds

The Cliff Swauger Award supports graduate students during the summer. Providing our students with an extended period of support to concentrate on mathematics is a great benefit to their graduate careers.

The Enochs Graduate Algebra Scholarship honors Professor Emeritus Ed Enochs and is awarded to an outstanding graduate student working in the area of algebra.

The Royster TA Award is given to a graduate student in their first four years who has showed excellence in teaching and promise in research.

A generous gift from a friend of the Department supports the annual **Hayden-Howard** lecture and provides **Fugate-Wells** fellowships to supplement the stipends of outstanding entering graduate

students.

Faculty and Research

The Edwards Chair recognizes outstanding research activity by a professor and provides extra support for research to the faculty member.

The Royster Chair is given to an associate professor who has an outstanding research record and provides extra support for the faculty member's research.

The Clasine Van Winter Fund provides support for an annual lecture in Mathematical Physics organized by the Department of Mathematics and the Department of Physics and Astronomy.

Donate Now

DOCTORAL GRADUATES IN 2015-16

During the past year, 12 students completed their Ph.D. The list below gives their names, the adviser in parentheses and their placement.

December 2015

Qiao Liang (Qiang Ye), Google, Software Engineer

Hao Wang (Qiang Ye), UK Department of Biomedical Engineering, Postdoctoral Scholar

Liam Solus (Ben Braun), Kungliga Tekniska Högskolan, Postdoctoral Fellowship

May 2016

Jonathan Constable (David Leep), Ameriprise Auto & Home Insurance

Sarah Nelson (Carl Lee), Lenoir-Rhyne University, Assistant Professor

Neville Fogarty (Heide Gluesing-Luerssen), Christopher Newport University, Assistant Professor

Yue Cai (Margaret Readdy), Texas A&M University, Postdoctoral Fellowship

August 2016

Laura Croyle (Russell Brown), Salve Regina University, Assistant Professor

John Mosley (Serge Ochanine), Phillips Exeter Academy, Instructor in Mathematics

Michael Music (Peter Perry), University of Michigan, Postdoctoral Assistant Professor

Gu Shu (Zhongwei Shen), Florida State University, Postdoctoral Fellowship

Yaowei Zhang (Russell Brown)

PROFESSOR'S MATH EDUCATION BLOG PROVIDES IMPORTANT TEACHING AND LEARNING RESOURCES

Ben Braun, Associate Professor of Mathematics at the University of Kentucky, is founding editor-in-chief of a **math education blog** for the American Mathematical Society focused on providing mathematicians with commentary and resources regarding teaching and learning. **Read More**

MATH PROFESSOR RECEIVES \$225,000 NSF GRANT

Qiang Ye, University of Kentucky professor of mathematics in the UK College of Arts and Sciences, has received funding from the National Science Foundation (NSF) to perform research and develop new algorithms for solving linear algebra problems that will address accuracy problems in computer arithmetic **Read More**

A&S MATH PROFESSORS RECEIVE SIMONS FOUNDATION GRANTS

Five professors from the University of Kentucky College of Arts and Sciences have received Simons Foundation Collaboration Grants for Mathematics. UK Department of Mathematics faculty members Richard Ehrenborg, Heide Gluesing-Luerssen, Margaret Readdy, Zhongwei Shen and Martha Yip will each receive five-year \$35,000 grants. **Read More**

MAGIC IN THE MATH DEPARTMENT

In organizing its spring 2016 information meeting for majors, the UK Department of Mathematics solicited faculty to give the closing address. Professor Richard Ehrenborg volunteered, but suggested a less traditional approach, his philosophy is simple: math is fun. **Read More**

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UK College of Arts
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