



NORTHWESTERN UNIVERSITY • THE JUDD A. AND MARJORIE WEINBERG COLLEGE OF ARTS AND SCIENCES • DEPARTMENT OF MATHEMATICS

SPRING 2011 NEWSLETTER

FROM THE CHAIR
P1

DEPARTMENT
NEWS
P2

THE
UNDERGRADUATE
P3

UNDERGRADUATE
NEWS
P4

GRADUATE
NEWS
P5

REMEMBERING
ANGELA GRANT
P7

PHOTO GALLERY
P8

FROM THE CHAIR

Bryna Kra, *Chair, Department of Mathematics*

As the academic year comes to a close, it is my pleasure to bring you news from the Mathematics Department. This is the first edition of the Mathematics Department newsletter and we plan to make it annual, bringing you news of faculty, students, staff and alumni. Please share your news with us and let us know what you would like to see in future newsletters.

Our faculty continues to change. Professor Steve Zelditch, a visiting professor from Johns Hopkins University last year, has made the move permanent. After completing a postdoc at Harvard University, Toby Gee joined us as an assistant professor in number theory. Six new Boas Assistant Professors joined the department in 2010-11: Dean Baskin from Stanford University (partial differential equations), Van Cyr from Penn

State University (dynamical systems), Gabriel Drummond-Cole from City University of New York (algebraic topology), Ana Rechtman from University of Illinois at Chicago (dynamical systems), Emmanuel Schenck from Lyon (partial differential equations), and Ting Xue from MIT (representation theory). Charles Pugh, Professor Emeritus at the University of California, Berkeley, visited for the year.

In another direction, Board of Trustees Professor Yuri Manin is retiring at the end of 2010-11 and will spend most of his time in Bonn.

In an incredible follow up to our winning three Weinberg College of Arts and Sciences teaching awards last year, we won two more awards: Professor Jared Wunsch won a *Weinberg College Distinguished Teaching Award* in recognition for his many years as one of the most highly valued teachers in the Math Department. Senior Lecturer John Alongi was awarded the *Arts and Sciences Alumni Teaching Award*, cited for his consistent excellence in teaching across a wide variety of courses.

In other faculty news, David Nadler was promoted to Full Professor. Professor Amie Wilkinson won the *2011 Ruth Lyttle Satter Prize of the American Mathematical Society*. Both Professor Wilkinson and Professor Kevin Costello gave invited addresses at the *2010 International Congress of Mathematicians* in
continued on page 6

Fields Medalist Curt McMullen, gave this year's Mark and JoAnna Pinsky Distinguished Lecture Series.



NORTHWESTERN
UNIVERSITY

DEPARTMENTAL NEWS HIGHLIGHTS



FACULTY NEWS:

Professor **Matthew Emerton** was named the *Arthur Andersen Teaching and Research Professor of Weinberg College for 2010-2012*.

Professor **Amie Wilkinson** was awarded the *2011 Ruth Lyttle Satter Prize of the American Mathematical Society*, with a citation for “her remarkable contributions to the field of ergodic theory of partially hyperbolic dynamical systems.”

Boas Assistant Professor **Dean Baskin** was awarded an *NSF Postdoctoral Research Fellowship*, joining current NSF postdoctoral research fellows **Gabriel Drummond-Cole** and **John Francis**.

David Nadler was promoted to Professor. In January, he gave a talk titled “The Geometric Nature of the Fundamental Lemma” in the *Current Events Bulletin Session* at the *Joint Mathematics Meetings* in New Orleans.

Professor **Steve Zelditch** is the principal lecturer at the *NSF/CBMS Regional Conference in the Mathematical Sciences “Global Harmonic Analysis”* to be held June 20-24, 2011 at the University of Kentucky.

Senior Lecturer **John Alongi** was awarded an *Arts and Sciences Alumni Teaching Award* in the Weinberg College of Arts and Sciences for 2010-11. Professor **Jared Wunsch** was awarded

a *Distinguished Teaching Award in the Weinberg College of Arts and Sciences* for 2010-11.

Boas Assistant Professor **Ellen Eischen** and Visiting Assistant Professor **Kalman Nanes** were honored with departmental awards for *Excellence in Teaching in 2010-11*.

GRADUATE NEWS:

Hiro Tanaka was awarded a *Presidential Fellowship* by Northwestern’s Graduate School for 2011-13. He also received the *Gelfand Award of 2010-11* for impressive progress in his research and his contributions to departmental life.

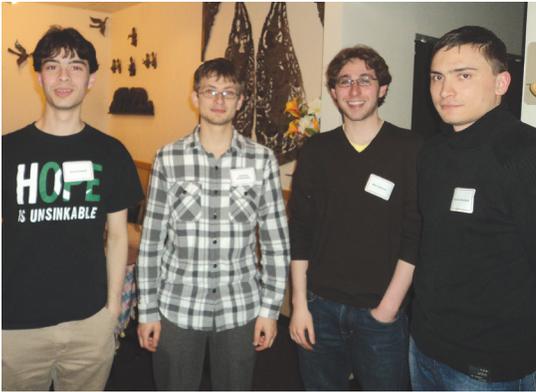
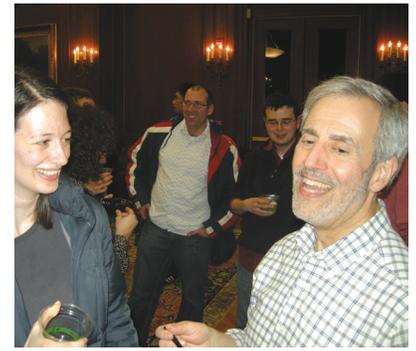
Vesna Stojanuskai received the *Best Thesis Award of 2010-11* for her thesis titled “Duality for topological modular forms”.

Sam Gunningham was honored with the *Mathematics Department Graduate Teaching Assistant Award for 2010-11*.

UNDERGRADUATE NEWS:

Northwestern’s **Putnam team** ranked 23rd out of 546 participating institutions in this year’s competition. Seven Northwestern students were among the top 500 participants and MEAS senior **Greg McGlynn** was in category II.

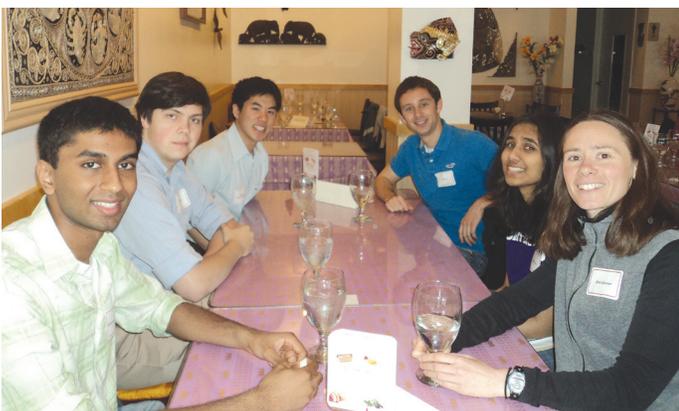
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THE UNDERGRADUATE



George Lu, '12



Counterclockwise from top right: Mike Stein, Director of Undergraduate Studies speaking with undergraduate thesis award recipient Andrea Heyman; students through the office hours of Professor Gabriel Drummond-Cole in Lunt Hall, High school students from the Chicago area at Terence Tao's lecture on *Structure and Randomness in the Prime Numbers*; Undergraduate Majors' Dinner; Undergraduate Awards Ceremony; Undergraduate Majors' Dinner.

Summertime always brings the happy anticipation of summer vacation, but also bittersweet goodbyes to friends. I will be saying farewell to a handful of outstanding seniors who will be graduating this year. All of them had impressive careers as math majors at Northwestern, taking graduate classes as undergraduates and producing stellar honor theses. While I admire their achievements as fellow math majors, far importantly, they were all my friends.

My personal experience is one of the myriad examples of how the mathematics department is such a close-knit community. If you happen to peek in on the Commons Room at tea time, you will often find faculty, graduate students, and undergraduates socializing together, and sometimes freshmen doing their calculus homework!

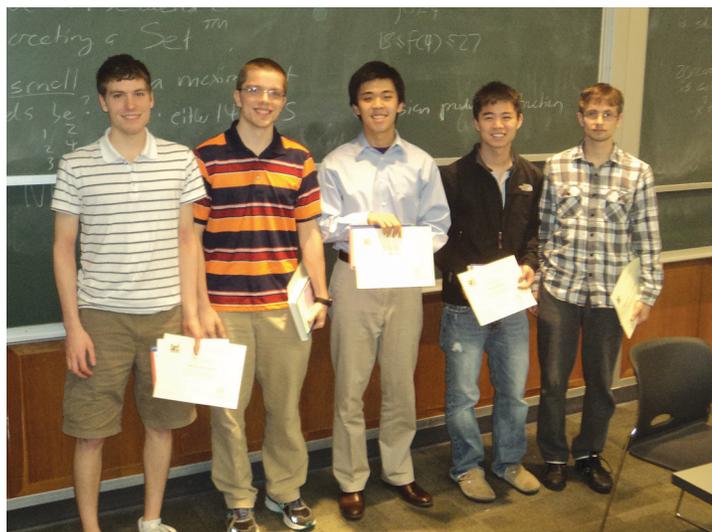
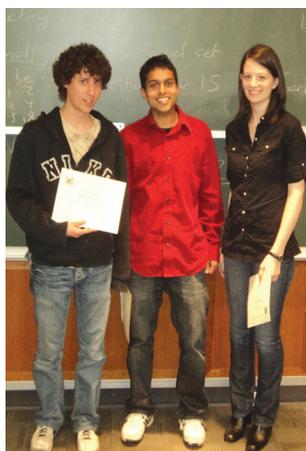
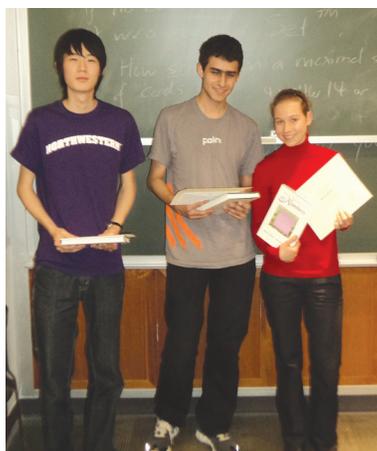
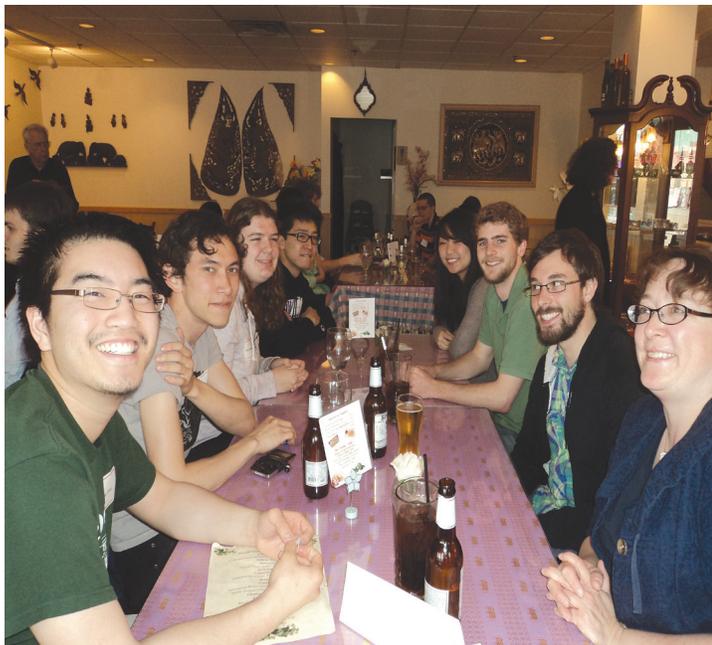
The mathematics department is one of the largest in Weinberg College, but I can say with confidence that our faculty are the most dedicated to the students, both graduate and undergraduate. Last year, our Director of Undergraduate Studies, Professor Michael Stein won the college's prestigious Community Building Award, which recognizes "faculty who foster a sense of community both inside and outside the classroom and who make students feel valued as members of the Northwestern intellectual community."

I have the luxury of one more year at Northwestern, but even after I graduate, I will always be a proud Northwestern math major.

—George Lu, WCAS '12

George Lu is Co-President of the Undergraduate Math Club and represents Mathematics on the Dean's Student Advisory Board.

UNDERGRADUATE NEWS



From top to bottom: Undergraduate Majors' Dinner; Undergraduate Awards Ceremony

2010-2011 UNDERGRADUATE PRIZE WINNERS IN MATHEMATICS

Robert R. Welland Prize for Outstanding Achievement in Mathematics by a Graduating Senior

Paul D. Gafni, Andrea L. Heyman, Ranjan Rohatgi

Outstanding Achievement in Mathematics by a Junior

Sascha Herrmann, Hanqing Lu

Outstanding Achievement in Mathematics by a Sophomore

Ewain N. Gwynne, Daniel B. Kaplan, Andrew S. Srisuwananukorn

Outstanding Achievement in Mathematics by a Freshman

Siddarth Narayanan

Exceptional Promise in Mathematics

Honghao Gao

Excellence in Mathematics by a Freshman

Maria Bovkun, Siyuan Cai, Jayanshu Jain, Andreas A. Kavouras, Matthew S. Serafin, Eric R. Swaney, Woojin Yang

Outstanding Achievement on the William Lowell Putnam Examination

Gregory E. McGlynn

High Achievement on the William Lowell Putnam Examination

Siyuan Cai, Darren J. Johnson, Michael A. Wurtz, Jincai Zhang, Peter H. Zhang, Aleksandr V. Zhukhovitskiy

Excellence as an Undergraduate Teaching Assistant

Brian Ting-Wei Chang, Ranjan Rohatgi

Outstanding Contributions to Undergraduate Mathematical Life

Hanqing Lu, Frederick R. Robinson

Honorable Mention for Achievement in Mathematics by a Junior

Frederick R. Robinson

Honorable Mention for Excellence as an Undergraduate Teaching Assistant

Andrea L. Heyman

GRADUATE NEWS

Paul Goerss, *Director of Graduate Studies*



Clockwise from top left: Reception for Terence Tao (left), the 2010 Frederic Esser Nemmers Prize in Mathematics winner; Q&A at Terence Tao public lecture; Lunt Hall; graduate students and faculty host a "Take Your Daughters and Sons to Work Day" workshop; math students; Graduate student awards ceremony.

The Department of Mathematics is an exciting and vibrant community of scholars. There are almost a hundred of us, all working on a multi-faceted project of research and teaching. Nearly half of the members of this community are graduate students, and they make important contributions to all aspects of the program.

The 2010-11 academic year began when we welcomed the first-year class of fourteen new graduate students, one of our largest classes ever. They are a diverse and accomplished group from top institutions: five received their undergraduate degrees in the US, four from China, and one each from Austria, Australia, Mexico, Switzerland, and the UK. The year will end with graduation of five new PhDs. Of particular note are Vesna Stojanoska, who will be a Moore Instructor at MIT next fall, and Evgeny Schinder, who will go on to the Max Planck Institute in Bonn, Germany.

In between these beginnings and endings, the on-going students have a remarkable impact, both in the department and nationally. Two of our students, Austin Ford and Hiro Tanaka, hold Presidential Fellowships, the most prestigious award Northwestern bestows on graduate students. Hiro and Jesse Wolfson hold National Science Foundation Fellowships, and another Fellow will join us next year. And next Fall, Hiro will travel to Aarhus, Denmark, supported by the Danish National Research Foundation. Some of our other students are supported by the Department's Research Training Grant in Mathematical Physics.

Inside the department, we recognized the accomplishments of our students. Bohan Fang and Justin Thomas shared the Best Thesis Prize in 2010; Bohan, a past Presidential Fellow, is now at Columbia and Justin is at Notre Dame. A new award, created through the generosity of Professor David Nadler, is the Gelfand Award for extraordinary contributions to the research goals of the community of graduate students. The past winners were Owen Gwilliam and Austin Ford.

Outside the department, graduate students Hiro and Owen, along with Shee Ganatra of MIT, organize the The MIT Talbot Workshop, which gathers graduate students from all over with a faculty mentor to work through some topic of current research. This year, they will work through non-abelian Hodge theory with Carlos Simpson from Nice, France. Talbot is in its eighth year, and is supported by the NSF. In general our students have been able to go to some exciting conferences and workshops, partly because of a generous grant from an alumnus specifically for graduate student travel. With the aid of these grants, our students have been all over the country and the world.

Finally, in alumni news, one of our most distinguished graduates, Professor Mike Hopkins of Harvard University, was elected to the National Academy of Sciences this year. Professor Hopkins received his PhD from Northwestern in 1984, working with Mark Mahowald, and was last on campus to give the Mark and Joanna Pinsky Lectures in February 2010.

FROM THE CHAIR

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Hyderabad, India, widely considered the most prestigious invitation a mathematician can have.

Fields Medalist Terence Tao of the University of California, Los Angeles spent a month in residence, in conjunction with being awarded the *2010 Frederic Esser Nemmers Prize in Mathematics*. The department held a workshop “Discrete Methods in Ergodic Theory” in his honor, opened by Tao’s colloquium attended by over 200 people. Tao also gave a number of talks including another in the workshop, a dynamics seminar, a number theory talk, an analysis seminar, and a public lecture to an overflow audience of more than 350. Scores of high school students from throughout the Chicago area attended this lecture.



Among the 2011 Emphasis Year events was the April *Trends in Dynamics* conference which brought seventy-five people together for 5 days.

The department also enjoyed the visit of *Fields Medalist* Curt McMullen, who gave the *Mark and JoAnna Pinsky Lecture Series*. His three riveting lectures on “Dynamics and Moduli Spaces” gave a broad overview of problems at the interface of dynamics and number theory.

Our departmental staff has had a busy year keeping up with the many visitors, conferences and other activities. Melanie Rubin continues to be a second mother to all our graduate students. We have been lucky to have two new excellent staff members join us. Greg Jue joined us last year as our business administrator, and at the beginning of this academic year, Cheryl Albiniaik became our new department assistant.

After many years of overcrowding, the department has acquired additional space in the 619 Emerson building on south campus. Some faculty will be moved to this location, and we will finally have space to give a permanent home to a Calculus Help Room. While we still dream of an addition to Lunt Hall, this helps alleviate the overcrowding.

I am both delighted and humbled by the achievements of our students and faculty. Thank you for your continued friendship to the Mathematics Department and for your ongoing commitment to Northwestern.

Best wishes,

Bryna Kra
Chair, Department of Mathematics

DEPARTMENTAL NEWS HIGHLIGHTS

continued from page 2
Sophomore math major **Sascha Herrman** won a *Barry M. Goldwater Scholarship*.

As of this writing, there are about 250 math majors and minors. Commencement will see the graduation of about 85 math majors, close to our all-time high figure of 91 a year ago.

We convened a **committee of undergraduates** to examine our undergraduate curriculum. Among their proposals: creating honors versions of our dynamics and probability courses (paralleling the existing honors abstract algebra and real analysis courses).

Overheard: our students refer to the abstract algebra and real analysis courses by the names “abstract” and “real”. Somewhere in that terminology is a lesson for us.

We would like to express our sincere appreciation to those undergraduate students who served this year as **Undergraduate**

Teaching Assistants: Mengyi Jiang, Susanna Haziot, Ranjan Rohatgi, Stephen Ni, Lauren Kahn, Brian Chang, James Yoo, Zhibo Zhao, Andrea Heyman, Shelley Mo, and Cindy Wu

We would also like to express our sincere appreciation to those students who served as tutors in the **Calculus Room**, a mathematics tutoring program serving the Northwestern University community: **Peter Weidner, James Yoo, Gabriela Escobar, Zahra R Ali, Benjamin Rothschild, Dassom Kim, Ranjan Rohatgi, Brian Chang, Arant Shah, and Pratik Shah.**

STAFF NEWS:

Cheryl Albiniaik joined our staff as the Department Assistant and was recently awarded a *Service Excellence Commendation* by Northwestern University.

REMEMBERING ANGELA GRANT

Martina Bode, *Distinguished Senior Lecturer*



Angela Grant (left wearing a brown jacket) with fellow members of the Math Department's *Relay For Life* team.

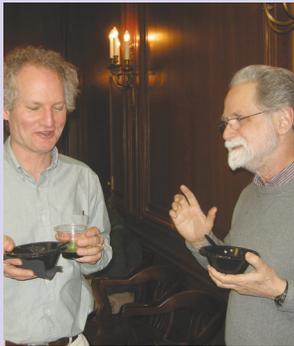
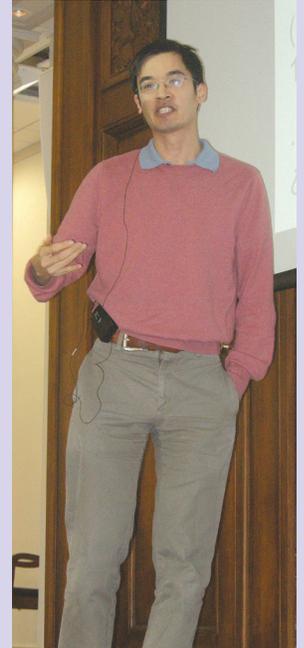
This fall the math department was deeply saddened by the loss of faculty member Dr. Angela Elyse Grant. Angela passed away on September 20, 2010. She was raised in northern Cincinnati, earned her Ph.D. from the University of Maryland, and joined Northwestern's Mathematics Department in 2005 as a Boas Assistant Professor studying chaotic dynamical systems. In 2008, Angela moved to the Weinberg College of Arts and Sciences office as an academic advisor, and continued to lecture in the math department.

Most recently, in the spring of 2010, she ran a freshman seminar on the mathematics of sports, which was very well received by her students. One student in the class, star Northwestern Men's Basketball team member Drew Crawford, said that Angela was the only person he ever met who knew more about sports than he did. She used that knowledge to connect with students and pique their interest in mathematics. Angela loved teaching, and touched many of her students who described her as "energetic and approachable." She held high expectations for her students and they responded well. It was evident Angela was passionate and enthusiastic about her students and her teaching.

Angela also made time for the math department's *Women in Math* group and its undergraduate mentoring initiative, as well as the math department's *Relay for Life* team. Outside of the department, she enjoyed creating pottery on campus, fantasy football, sports, games and music.

Angela lost her life at the young age of 36 after a long struggle with breast cancer. Although she battled cancer her whole time at Northwestern, many in the department did not even know she was ill. When her cancer returned for a second time, she received an outpouring of love and support from many of her former students. She continued to teach and advise while undergoing various treatments, never dwelling on her illness. Rather, Angela was always full of joy, and remained hopeful for what the future would bring. She demonstrated great strength and faith during her battle with cancer. She will be most remembered for her happiness and spirit, her warm personality, and her laughter. Her students got it right: "She's the best!"

PHOTOS



Photos:

Clockwise from top left: Kal Nanes and Ellen Eischen receive "Excellence in Teaching" awards from Math Chair Bryna Kra (center); Undergraduate Dinner at *Siam Splendor*; 2010 Nemmers Prize winner Terence Tao; Overflow audience at Terence Tao's public lecture at Northwestern; Undergraduate Dinner at *Siam Splendor*; A Math Dept "Tea"; Graduate students Yuan Shen and Irina Bobkova perform a waltz at the department's annual Holiday Party in Hardin Hall; Dean Craig Bina (left) and *Henry S. Noyes Professor of Mathematics* John Franks.



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