

Chair's Column

Dear members and friends of the UNT Math Department,

How many faculty members do we have? How many PhDs do we award each year? How many departmental scholarships are available to our students? You will find



Su Gao

the answers in this issue of Math News, the newsletter of the UNT math department.

Why does anyone care about the answers to these questions? To me, the answers are indicators of how well the department is doing. Since you are already reading this newsletter, chances are these answers matter to you as well, and you care about the department enough to want to know the answers.

Higher education nowadays is facing a lot of challenges, and UNT is no exception. With the collective effort of all faculty, students, alumni, and friends, UNT Math has taken these challenges and emerged a stronger department! I am really proud of the many great milestones that our department has achieved in the past few years. To give a few examples, the number of math majors has more than quadrupled in the last decade, while in the same period of time the university student body increased by 60%. More than 50% of our regular faculty members have current external grants for research, training, teaching or conference. In 2012 the department received over \$40,000 of personal gifts to fund scholarships for students.

I can go on and on, but you can also find out more by reading the rest of this newsletter. As much as I like to brag about our past achievements, I am also excited about where we are going in the years to come.

And by the way, here is another reason I like the questions at the beginning of this column: the answers are all numbers.

Su Gao
Professor and Chair

RTG Program awarded by the NSF

The National Science Foundation awarded the UNT Department of Mathematics more than \$1.5 million in 2010 to establish a Research Training Group (RTG) program in Logic and Dynamics. In the following five years this grant will support the training of postdocs and graduate students in the program for their research in an area related to logic and dynamics, and it will sponsor undergraduate mathematics research both in the academic year and in the summer. The award is made from the prestigious EMSW21 (Enhancing

the Mathematical Sciences Workforce in the 21st Century) program of the NSF, whose objective is to increase the number of well-prepared U.S. citizens, nationals, and permanent residents who pursue careers in mathematical sciences and in other NSF-supported disciplines. For information on the RTG activities and how to apply for postdoctoral, graduate, and undergraduate research support under the program, please visit the RTG website <http://math.unt.edu/research/research-training-group>.

UNT Teach North Texas program graduated first group of students

In December 2010, the first graduates of UNT's Teach North Texas program earned their degrees, having completed the innovative program that encourages students majoring in math, science and related fields to consider teaching. Approximately 200 undergraduate students are currently enrolled in the program.

Teach North Texas was created to meet the state and national need for qualified mathematics and science teachers and to improve the quality of math and science instruction in secondary schools. According to a 2007 report by the National Academy of Sciences, approximately 30 percent of math and science teachers do not have appropriate certification.



The UNT program started in Fall 2008 and is run through a collaborative effort between UNT's College of Education and College of Arts and Sciences. Students can earn a degree in math, science or a related field while also earning a teaching certificate.

"Our graduates are literally the pioneers of Teach North Texas," said Dr. John

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{ Faculty News

Professor Neal Brand Won President's Council Teaching Award



Neal Brand, Professor of Mathematics and Associate Chair of the Mathematics Department, received the 2011-2012 President's Council Teaching Award in an award ceremony in October 2012.

This distinguished university award recognizes at most two faculty members a year for their teaching excellence over at least a five year period at UNT.

In addition, Professor Brand was named by UNT President Lane V.

Rawlins to be the sole nominee from the university for the prestigious Minnie Steven Piper Award for excellence in teaching.

Neal Brand

Congratulations to Christine Uhl for winning one of four university-wide outstanding TF-TA Awards!

Christine Uhl, a math graduate student, was recognized at the Honor's Day Convocation on Friday, April 5th, at the Murchison Performing Arts Center.

Christine has established herself as an outstanding instructor of Math 1100. Her students universally admire her engaging style of classroom instruction and appreciate her patience and dedication to help them learn. She also played a vital role in an REU program organized by Dr. Anne Shepler, and helped organize the first Texas-Oklahoma Representations and Automorphic Forms (TORA) conference. In addition, she energizes the entire department by organizing and motivating many formal and informal activities outside of the classroom.



Christine Uhl

New Faculty and Lecturers

The department welcomes Dr. Rajeev Azad, Assistant Professor of Biological Sciences and Mathematics. Dr. Azad has been on campus since January 2011. But now he has a home in the Math Department! Professor Azad is a bioinformatician.



Dr. Rajeev Azad

The department welcomes Dr. Lior Fishman who is an Assistant Professor of Mathematics. Dr. Fishman obtained his PhD in 2008 from Ben Gurion University, Israel, under the direction of Barak Weiss. From 2008 to 2011 he was a postdoctoral fellow at Brandeis University. His research interests are in dynamical systems, geometric measure theory, and Diophantine approximation.



Dr. Lior Fishman

The department welcomes Dr. Jiaping Wang to join us as



Dr. Jiaping Wang

our newest Assistant Professor. Dr. Wang obtained his PhD in Mathematics from SUNY Binghamton in 2009. For the last three years he has been a postdoctoral research associate in the Department of Biostatistics at the University of North Carolina-Chapel Hill. Dr. Wang specializes in statistical functional data analysis and nonparametric estimation.

The department welcomes Dr. Basu, Ms. Hines, Dr. Tran, and Dr. Widmer as our new lecturers.



Dr. Basu



Ms. Hines



Dr. Tran



Dr. Widmer

New Postdocs

Dr. Aaron Hill is an RTG Postdoctoral Fellow. He earned his PhD in 2011 from the University of Illinois at Urbana-Champaign under the direction of Slawomir Solecki. His research interests are in descriptive set theory, topological groups, and dynamical systems.



Dr. Aaron Hill

Dr. Bill Mance is an RTG postdoctoral fellow with research interests in dynamical systems, ergodic theory, and number theory. He received his PhD in mathematics from the Ohio State University.



Dr. Bill Mance

Dr. Kostas Beros will be a new RTG Postdoctoral Fellow starting in the fall of 2013. He is currently a PhD candidate at the University of Wisconsin. His research interests are in descriptive set theory and topological groups.



Dr. Kostas Beros

RTG's International Conference on Logic and Dynamics with a celebration of the work of Dan Mauldin

Mathematicians and students from across the United States, as well as Canada, Denmark, England, France, Hungary, Israel, Scotland, converged in the Business Leadership Building the week of June 4, 2012 for the conference, *Logic, Dynamics and Their Interactions, with a Celebration of the Work of Dan Mauldin*. The conference, organized by the Research Training Group and supported by the University and the National Science Foundation, presented a five-day program comprising 26 individual talks and two, three-talk "mini-courses."

The prime objective of the conference - bringing together a spectrum of logicians and dynamists, both prominent and promising, for a program including exciting, current research and emphasizing the interface between these two specializations - was achieved with great success!

The conference likewise succeeded in its intention to pay tribute to UNT Professor



Emeritus Dan Mauldin's contributions to logic, dynamics and UNT. The program included presentations by a number of Mauldin's collaborators and former students as well as a joint talk by UNT Department of Mathematics faculty, Dr. Jackson and Dr. Urbański, highlighting select logic and dynamics research results obtained by Mauldin. Mauldin was also the

guest of honor at the conference banquet, which featured a testimonial comprised of comments, letters and a slideshow of photos from personal collections, all contributed by family, friends, collaborators, colleagues and students, as well as Dr. Mauldin's math genealogy.

The conference also achieved broader goals through introducing UNT's physical campus to many attendees who had never visited us before and underscoring the Department of Mathematics efforts toward establishing itself as a strong presence in math research.

Conference webpages featuring the program with talk abstracts, speakers' slides, a full participant list and a variety of general information related to the conference can be accessed via the link in the conference title in the first paragraph of this story as well as through other links throughout the Department of Mathematics web pages.

The 13th annual meeting of CombinaTexas: In Honor of Joseph Kung

CombinaTexas: a combinatorics conference in the South-Central United States, is an annual regional conference on combinatorics, graph theory, and computing. It is dedicated to the enhancement of both the educational and the research atmosphere of the community of combinatorialists and graph theorists in Texas and surrounding states.

UNT Faculty Member **Joseph Kung** is a member of the CombinaTexas steering

committee, and last year's meeting was held in honor of his sixtieth birthday. The theme of the meeting was Designs, Graphs, and Permutations, and the meeting took place April 21-22, 2012 on the campus of **Southwestern**



Joseph P. S. Kung

University. More information about the conference can be found on the conference website: <http://cs.southwestern.edu/~denman/CombinaTexas2012/>

Joseph P. S. Kung is a leading figure in the area of combinatorics known as **matroid theory** and has a long record of distinguished service to the mathematical profession in his role as Editor of *Advances in Applied Mathematics*.

Math News

TNT from Page 1

Quintanilla, co-director of Teach North Texas and Professor of mathematics at UNT. "I've watched many of them teach, either in the field or practicing in class, and have been consistently impressed with their dedication to fine-tuning their skills in communicating their love for mathematics and science to their future students."

The TNT program partners students with area school districts providing them with opportunities to gain firsthand teaching experience. As early as their freshmen year, students take courses in the professional development sequence that emphasize field

experiences, teaching strategies and concepts related specifically to the subjects the students will teach.

The program's curriculum begins with two free, for-credit courses in which students teach elementary and middle school students three times each semester under the direction of experienced classroom teachers. Students receive field experience in area high schools in more advanced courses, including the final semester of student teaching.

Another key aspect of the program is the students' interaction with UNT faculty master teachers, who are experienced high school teachers hired by UNT to teach

courses, supervise field work and offer real-world advice to the future teachers.

Most of the graduates are now teaching in area school districts.

Teach North Texas is based on the innovative **UTeach** model developed at the University of Texas at Austin in 1997. UNT was one of 13 universities nationwide to receive a replication grant by the UTeach Institute in 2008. Teach North Texas was initiated with a \$1.4 million grant from the Greater Texas Foundation, and the National Math and Science Initiative will contribute an additional \$1 million if matching funds are raised by 2012.

{ Department News

TORA IV Conference Took Place at UNT the Weekend of March 23-24

The Texas-Oklahoma Representations Automorphic forms (TORA) IV conference will take place at UNT the weekend of March 23-24, 2013.

Texas-Oklahoma Representations and Automorphic forms (TORA) is a new conference series, which will be hosted in rotation by Oklahoma State University, the University of Oklahoma, and the University of North Texas. Pending funding, there will be two TORA conferences per year. These will be weekend conferences with talks on Saturdays & Sundays. There will be two invited plenary speakers and one invited graduate student talk each meeting.

The TORA meetings will bring together the automorphic forms and representation theory community of the South Central region to hear about recent research in automorphic forms and representation theory. Graduate students and junior researchers are particularly encouraged to attend and present their own work.



Recent Graduates

In 2012, fourteen new UNT Mathematics graduate alumni were added to our rolls. The University of North Texas granted eight PhD and six master degrees in Mathematics. Of the six master degree graduates, we welcome back Eduardo Espinola, Yujie Yan, Thomas Kinzeler, and Drew Tillis who are continuing on and making good progress toward their PhD degrees in Mathematics here at UNT. We also send our best wishes to Robert Hingtgen who is continuing toward his

PhD at the University of California at Santa Cruz and Colin VerNooy who moved to the University of Oklahoma to pursue his PhD.

The eight PhD graduates are now spread around the country living in seven different states. David Simmons has a Postdoc position at The Ohio State University. Jeannette Larsen stayed here at UNT where she is teaching this year. Tushar Das and Brianna Foster-Greenwood moved Northwest and they have positions at Oregon State University and Idaho State

University, respectively. Both Husanbir Pannu and Dushanthi Herath have moved west to Los Angeles. Hasina Akter moved north to teach at the North Central Campus of Purdue University which is in Indiana. Mingzhi Xuan decided to go east and he has a position at the University of West Georgia.

If you are an alumnus of the mathematics department we would love to hear where you are and what you are doing. Please send us a note and we can include your information in a future newsletter.



{ Faculty News

Retired Faculty News

For those of you have been at UNT for a few years, it is no surprise to hear what three of our retired faculty are currently up to. In fact, it is not obvious to the casual observer that they have retired! For example,



John Ed Allen

John Ed Allen was chair of the department for 23 years before becoming the Associate Dean of TAMS. He retired in 2011 as a tenured faculty member. Throughout his career he loved teaching and his students loved him. So now that he is retired, what is he doing? He is still teaching, of course! As an adjunct he is teaching two sections of calculus and one of them is a TAMS section. This marks his 50th year of teaching at UNT. Dr. Allen was on Korean national TV related to his teaching TAMS students!

Dan Mauldin is another recently retired faculty member who is continuing his professional activities. He spends part of the year in Denton and most of the rest of his time in San Diego where he consults at the Center for Communication Research. He is usually in Denton from sometime in

September through part of January. While in Denton, we often see him in the department visiting and working with colleagues.

Dan was selected to be one of the main speakers at the Erdos Centennial in Budapest July 1-5 this year. It is a great honor to be invited to speak at this conference. If you were here in the 1980's and 1990's you may remember that Erdos made fairly frequent visits to UNT and that was mainly due to Dan. Erdos was very influential developing the department and its students. Furthermore, his visits to UNT decreased many of our Erdos numbers!

John Neuberger is another retired faculty member who is not letting the grass grow under his feet. In the last couple years, he published a second edition of his book *Sobolev Gradients and Differential Equations* which is a substantial expansion on his first edition which was published in 1997. He has also published *A Sequence of Problems on Semigroups* as a Springer book and he has a substantial amount of work done on a third monograph for Springer on *Quasianalyticity and Finite Differences*. He continues to do



Dan Mauldin

research in the areas of image enhancement, global-local, in time, problems for one parameter semigroups, simplification of the proof of the Poincare conjecture, the Jacobean conjecture, mathematics related to the Riemann Hypothesis and Sobolev gradients. John consults for several government agencies and Interactic Holdings.



John Neuberger

Although John is not teaching at UNT now, he still has one PhD student at UNT who is making good progress. Furthermore, John still has a keen interest in Inquiry Based Learning. He continues to work with the Educational Advancement Foundation where he is particularly interested in helping people use more Inquiry Based Teaching in both calculus and graduate courses.

John is planning to attend and give several talks this year at various conferences. He is also doing his usual editing and refereeing work. As John said, "Aside from the above, not doing much of anything."

If you are a retired UNT Mathematics faculty member, let us know what you are doing so we can include your story in future newsletters.

{ From Our Students } Moments of Distract

TAMS students have special relationships with their math professors, and get to know them quite well. When I was discussing this with several people, I found that there is a wide spectrum of what each professor enjoys talking about when they get "momentarily distracted":

"My professor talks about his woodworking techniques and how he enjoys making Tibetan spindles."

-Michael Wu

"Sometimes my professor will talk a lot about presidents, especially the ones who contributed to math somehow. I never knew that President Garfield came up with his own Pythagorean proof."

-Ankitha Gangarapu

"Our professor talks about a variety of things. One of his favorite topics is his injured shoulder, but sometimes he drifts to swimming, philosophy, and economic theories."

-Julian Creel and Robin Ahmadi

"For some reason, my professor is really interested in fancy boxes. He also enjoys discussing the follies of people."

-Roja Manohar

"Sometimes my professor gets scared that when she messes up, her dad will be there to yell at her. She has to remind herself that he can't, because he lives in another country."

-Jenny Park

"For reasons unknown to us, our professor saw us in her winter holiday in France, and tells us how much that creeped her out. Also, she enjoys connecting math to her garden, where she accidentally told her workers to cut down all of her rosebushes. With a chainsaw."

-James Ye

Math can be fun, but sometimes everyone just needs a break from it for a few minutes.

"It is not of the essence of mathematics to be occupied with the ideas of number and quantity."

-George Boole (1815-1869)

Submitted by Natalie Wingfield (TAMS)

{ Student News

Putnam Team and MCM Team

The department has fielded strong undergraduate math teams to compete in the prestigious national Putnam Competition in recent years. Every year over 1,000 teams compete from all over the US and Canada. The UNT team ranked in top 100 in two of last four years, and in the top 150 five times in the last 7 years. In 2007, the UNT team placed in the top fifty nationwide.

Coached by Professor Jay Liu, the UNT MCM (The Mathematical Contest in Modeling) team, consisting of undergraduate

and TAMS students David Broyles, Adam Su, and Patrick Yu, successfully participated in the Mathematical Contest in Modeling last spring. This was our first participation in the last 10 years. The team received Honorable Mentions. Congratulations! Among over 3,600 teams, only 11% of the teams received better results.

This year's UNT MCM team consists of three TAMS students: Shawn Hu, Preetam Palchuru, and Sayon Sengupta. Good luck, UNT MCM team!

Math Grad Student on the Winning Team for the Innovation Challenge

Congratulations to Eduardo Espinola and his team members for winning the first place award for the Innovation Challenge! The Innovation Challenge is an initiative sponsored by UNT and Alcatel-Lucent which allows UNT student teams to refine and present their ideas to DFW business and technology leaders.

The winning idea by Eduardo's team is to develop an iPad app to assist handicapped people navigating a facility. It displays a detailed map of how to get from one point to another indicating where ramps, elevators, and handicap accessible restrooms are. The

team's presentation included statistics about disabled people, the target market, why this app would be successful, the estimated initial investment and the potential revenue, and some ideas of how the actual interface of the app would look like.

The competition took place on November 19, 2012, at the Alcatel-Lucent Gravity Centre in Plano. There were 6 teams competing in the final round and Eduardo's team got the first place. Each of the winning team members was awarded an iPad. Great job!

2012 Integration Bee

The 2012 Integration Bee was held on April 20 2012 in GAB 105. There were approximately 70 students who participated. There was a huge cake and other refreshments as well and there were even a few prizes of containers of honey! The winners received gift cards of \$75, \$50, and \$25. The winners were Trevor Davila (first place), Chenyao Yu (second place), and Enkhjargal Lkhagvajov (third place).



{ Number Facts

Here are some numbers that give a snapshot of the department, as of Fall 2012:

- 6 number of PhDs graduated in 2012
- 10 number of part-time faculty members
- 36 number of full-time faculty members (including postdoctoral fellows)
- 43 number of bachelor's degrees awarded in 2012
- 45 number of TAs and TFs
- 60 number of graduate students
- 203 number of math class sections offered in Fall 2012
- 300 number of math majors (approximate)
- 8,000 total enrollment in all math classes in Fall 2012 (approximate)

{ Department Awards

2013 Departmental Awards and Scholarships

Faculty Awards:

Faculty Research Award:

Dr. Steve Jackson

Faculty Teaching Award:

Dr. Mariusz Urbanski and

Dr. Kiko Kawamura

Faculty Service Award:

Dr. William Cherry

Graduate Awards:

Academic Excellence Award:

Jared Holshouser and Drew Tillis

Teaching Excellence Award:

Mike Cohen and Christine Uhl

Graduate Scholarships:

John Ed Allen Scholarship:

Connie Chan

Altermann and Bradford Scholarship:

Edward Krohne

John Neuberger Scholarship:

Brandy Comer

Undergraduate Scholarships:

David F. Dawson Scholarship:

Duong Bach Nguyen

E. H. Hanson Scholarship:

Beier Lu

Joseph P. S. Kung Scholarship:

Chris Scarborough

Mildred Masters McCarty Scholarship:

Kyle Auble

Roger L. Perry Scholarship:

Donna House

{ You Can Help!

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\$_____ Mathematics Department Fund: An expendable fund that enables the chair to support department priorities such as faculty recruitment, outreach activities, research visitors, student events and conferences.

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\$_____ E. H. Hanson Scholarship \$_____ Roger L. Perry Scholarship

\$_____ Joseph P. S. Kung Scholarship

I would like to make this donation anonymously.

In addition to these funds which support a variety of department programs, we benefit from campus-wide funds that support undergraduate scholarships and graduate student fellowships. We invite friends of the department to contribute to an existing fund or to contact the chair to discuss creating a new fund for a specific purpose. Thank you for supporting the activities of the UNT Department of Mathematics.

Please Tell Us!

Your classmates and the UNT Department of Mathematics would love to know what important things are going on in your life, and we welcome your submissions for the Class Notes section of Math News, as well as for our Website. Email your updates to mathchair@unt.edu. We look forward to hearing from you!

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