Message From the Chair
by Peter Trapa

I'm pleased to report on many exciting developments in the Math Department this fall. In addition to welcoming an outstanding collection of new graduate students and postdocs, we are also hosting a number of renowned visitors. The level of research activity in all of the Department's specialties has made this semester already a very memorable one. Meanwhile, our faculty continue to collect prizes and awards for their research accomplishments, some of which are detailed below.

In terms of the educational mission of the Department, our enrollments are at all-time highs. Our new Associate Chair, Nick Korevaar, continuing the work of Henryk Hecht, has done a fantastic job insuring instructional excellence in all of our classes. Meanwhile, Math for America (MfA) Utah has received significant funding from the Utah Legislature. Aaron Bertram will take over from Hugo Rossi as Director of MfA Utah, and will continue the Department's long-standing tradition of training outstanding secondary teachers of mathematics.

On the staff side, we are delighted to welcome Aryn DeJulis as the Director of our fantastically

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successful T. Benny Rushing Tutoring Center for undergraduate students. Like her predecessor, Angie Gardiner, Aryn was one of our own math majors and participant in the ACCESS program. Angie has moved on to become the Department's first full-time Undergraduate Advisor. In her new role, Angie will work especially close with our majors. She will also be forging new connections with University College.

Last Spring, we sent two of our long-time colleagues, Joe Taylor and Peter Trombi, off into retirement. Both served the University in many important capacities, and both were instrumental in elevating the Department to national prominence. My gratitude to Joe and Peter is eclipsed only by my respect for them.

Looking forward, the future looks especially bright. We should also be in a position to make more tenure-track offers this Spring, expand our well-established postdoc program, and continue to build upon our top-notch collection of graduate students. Stay tuned!

Image courtesy of the University of Utah

New Members of the Department

We'd like to extend an enthusiastic welcome to those who are new in the department this year, and we hope that they are beginning to feel at home here.

Our new Wylie Assistant Professors are:

• **Kunwoo Kim** received his PhD from the University of Illinois in 2012. His interests lie at the intersection of probability theory and dynamical systems.

• **Ric Wade** received his DPhil from Oxford in 2012. He works in the area of geometric group theory and is interested in applications to low dimensional topology.

• **Yi Zhu** received his PhD from SUNY Stonybrook in 2012. He studies algebraic geometry, in particular rational curves on algebraic varieties and applications to arithmetic geometry.

We also welcome a number of Research Assistant Professors:

• **Will Nesse** received his PhD in 2008 from Utah in mathematical biology. He will serve as our new Engineering Math Coordinator.

• **Ivan Sudakov** received his PhD from St Petersburg State in 2012. He is an applied mathematician with particular interests in climate science.

• **Sofia Tirabassi** received her PhD from Roma TRE in 2012. She specializes in algebraic geometry and homological algebra.

• **Qinghai Zhang** received his PhD from Cornell. He specializes in applied mathematics and computational fluid mechanics.

Mathematics Department Welcomes 22 New TA's
by Andrejs Treibergs

We are pleased to welcome twenty-two new teaching assistants who have joined our department. They represent the top applicants found by the Graduate Admissions Committee, whose members are Peter Alfeld (chair), Dan Ciubotaru, Christel Hohenegger, Kevin Wortman and Andrejs Treibergs. Before classes began, these new teachers prepared for their duties in a two week long TA Training Workshop, led by Kelly MacArthur.

Here is the list with undergraduate university: Pavel Bezdek (UTEP), Christopher Brooks (Texas A&M), Heather Brooks (Utah), Priscilla Elizondo (Univ. of Costa Rica), Fan Honglu (Zhejiang Univ.), Bhargav Karamched (Oklahoma), Myla Kilchrist (Colorado State), Chung Ching Lau (Hong Kong Univ. of Sci. & Tech.), Shiu-Tang Li (National Taiwan Univ.), Anna Macquarie (Colorado State), Sean McAfee (UIC), Jenna Noll (Kentucky), Todd Reeb (Temple), Chris Robison (Utah), Michael Shrieve (Utah), Shiang Tang (Dalian Univ. of Tech.), Rebecca Terry (Dartmouth), Jia Wang (Utah), Yiping Wang (Tsinghua Univ.), Derrick Wigglesworth (Maryland), Bin Xu (Univ. of Sci. & Tech. @ Heifi), Leif Zinn-Bjorkman (UCSD).

Director of Undergraduate Services, Aryn DeJulis
by Angie Gardiner

Aryn DeJulis joined the math department in July as the Director of Undergraduate Services, bringing incredible organization and a fresh perspective to the math center. Aryn replaced Angie Gardiner, who is now our Undergraduate Advisor. Aryn is an alumna of our department, graduating with her BS in mathematics in 2010. She is also an alumna of the ACCESS program, through which she worked with Elena Cherkaev, using Newton's method to generate fractals. After graduating she worked as a Patient Access Representative for University Hospital before joining us here in the math department. Aryn loves to read, and enjoys all kinds of books, from fantasy to nonfiction. She also loves playing with her dog, Bella. We are excited to have Aryn in the math department, so stop by and say hello if you haven't had the chance to meet her yet.

Associate Chair, Nick Korevaar
by Nat Smale

Most of you know Nick Korevaar, as he is the new Associate Chair of the department, having taken over the duties from Henryk Hecht this past summer. Nick's duties as Associate Chair include all aspects of teaching, such as teaching assignments, handling student complaints, scheduling, mentoring new teachers, as well as issues involving space (such as office assignments), and overseeing the

department when Peter is away. If you have any questions about teaching, he is the go-to person.

Nick received his PhD at Stanford in 1981, and came to Utah in 1988, after stints in Kentucky and San Diego. His research interests are variational problems, and geometric analysis.

Nick is widely known as an excellent teacher. Both his current position as Associate Chair, and his previous position as Director of Undergraduate Studies reflect his interest in the teaching mission. He has a received the MAA Intermountain Section Teaching Award, and the Department's Undergraduate Teaching Award.

Nick has always been interested in good teaching, and acted as a graduate student teaching mentor while a graduate student at Stanford. Later, his interests in teaching were reinforced while raising his kids. Nick is especially proud of his involvement with the College of Science's summer ACCESS program, in which he taught the math component for over a decade. This is a program of intensive study over the summer, for talented incoming freshman women who are interested in science and math. He is happy to pass on these duties to a new crew of energetic young math faculty members.

Some of Nick's main interests outside of math involve outdoor sports, especially running and swimming. Salt Lake City's ideal location for sporting activities is partly what drew Nick here, along with the opportunity to join our department. He grew up mostly outside and next to the ocean in La Jolla, California, and likes returning there to participate in the La Jolla Half Marathon and the La Jolla Rough Water Swim, with friends and family. Here in Salt Lake City he likes to swim and socialize with the local Masters group, and run in the foothills. A new adventure this past summer was participating in the Wasatch Back running relay.

Nick is also an avid gardener. He produces large amounts of fruit and vegetables in his home garden.

Staff Awards

Angie Gardiner has reached 15 years of service with the University of Utah. CONGRATULATIONS!

Angie worked for the College of Science Dean's Office in 1996-1997, then spent a year at Salt Lake Community College before returning to the University in 1998 and has been working in the math department ever since (lucky us!) She has been an invaluable asset to our undergrads with her work in the Math Center, transforming its services from an indifferent beginning to the hugely successful and effective operation we have today. She has taken it upon herself to see that the students on campus get every opportunity to succeed in their math courses. To our students, Angie is more than just a staff member, she is a mentor that is always there for them to help in anyway she can. Now she will continue to serve our undergrads in her new role as Undergraduate Advisor.

Angie is responsible (in her duties to the undergraduates), creative (in seeking out new ways of serving undergraduates), persistent (in making sure our undergraduates are cared for), enthusiastic, warm (with a perpetual open door), comforting (to every undergraduate, TA or fellow staff member with a problem) and above all, extraordinarily single-minded in her mission to provide the best possible services for every student taking a mathematics course at the University of Utah.

We thank her for the 15 years of dedicated service and know she will continue to do great things as the undergraduate advisor!

Faculty Distinctions

Distinguished Professor Christopher Hacon was named a Simons Foundation Investigator, joining an elite group of just seven mathematicians to hold this distinction. The award is renewable up to ten years, and provides $120,000 annually to support Christopher's research activities.

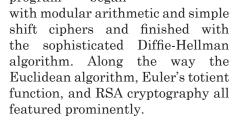Distinguished Professor Graeme Milton received the 2012 Rolf Landauer Medal of the International Electrical Transport and Optical Properties of Inhomogeneous Materials (ETOPIM) Association. The award recognizes outstanding senior researchers in the field of Composite Science worldwide.

Summer Programs

High School Program
by Sarah Cobb

This summer, nineteen high school students gathered for the annual Summer Mathematics Program for High School Students. This year's program was directed by Lance Miller, assisted by Sarah Cobb, Emma Chandler, and Lisa Friedman. The students spent three weeks studying number theory and its applications to cryptography. The program began with modular arithmetic and simple shift ciphers and finished with the sophisticated Diffie-Hellman algorithm. Along the way the Euclidean algorithm, Euler's totient function, and RSA cryptography all featured prominently.

In addition to pencil-and-paper computations, the students spent time in a computer lab learning to program in python. By the end of the three weeks, the students had working code to encrypt and decrypt messages in several different codes, as well as perform number theory computations. They made use of their programs to crack the codes used in challenge puzzles throughout the three weeks.

The students also learned about other branches of mathematics in daily colloquium talks. Some favorite presentations included topology with Stefano Urbinati; population genetics with Fred Adler; origami with Morgan Cesa; and sea ice with Ken Golden.

The program's final day saw the students applying what they had learned to competitions. Math Jeopardy, a perennial favorite, covered all of the topics in the program: number theory, python code, encryption and decryption in various schemes, and topics from colloquia. The students also participated in a scavenger hunt in which they received clues that they had to share with the rest of their team. Since they were only allowed to use public channels, all the teams applied their public-key encryption skills. Teams that could assemble all the information without another team intercepting it got prizes. www.math.utah.edu/outreach