

For ALUMNI and FRIENDS

Proof Reader

From the School of Mathematics, College of Sciences @ Georgia Tech®

Georgia
Tech



Notes from the Chair



My first year as Chair of the School of Mathematics (SOM) is coming to an end and, as I look back, I see a year of remarkable productivity and achievement by our faculty, staff and students. It's been a pleasure to learn more about the School, contribute to on-going initiatives and start a few new ones.

Here are a few of the exciting things happening in the School:

Robin Thomas has been appointed Regents' Professor, the highest academic rank in the University System of Georgia. Professor Thomas was recognized for his ground-breaking work in graph theory and discrete mathematics, his long and successful record of mentoring students and his leadership of the interdisciplinary program in Algorithms, Combinatorics, and Optimization (ACO). See page 16 for a profile of Professor Thomas.

Regents' Professor Leonid Bunimovich's work on "mushroom billiards" is inspiring researchers here and elsewhere—two top journals in mathematics and physics have recently featured graphics on their covers related to this work and that of Professor Bunimovich's student, Alex Grigo. Alex won the Institute-wide 2010 Sigma Xi PhD thesis award for his work entitled *Billiards and Statistical Mechanics*. See page 6 for more on mushroom billiards and page 17 for more on student awards.

Our faculty continues to be awarded grants, contracts and honors at a high rate. Fully 83% of the faculty currently have support from federal grants. Among the junior faculty, four have active awards from National Science Foundation's prestigious CAREER program and two have recently been awarded Sloan Foundation fellowships. The number of these highly competitive awards earned by our faculty is striking and matched by very few of our peers.

To ensure that our next faculty appointments have maximum impact in terms of advancing the School, we have developed a five-year strategic hiring plan. It calls for a balance between opportunism (hiring the best people on the market at a time when many competing schools are not able to hire at all) and strategically developing existing research groups while building bridges between others. In particular, the plan calls for more faculty in Algebra,

Applied and Computational Mathematics, Mathematical Biology, and Probability and Statistics. The plan also emphasizes other characteristics of the faculty we hope to appoint, notably their ability to contribute to all aspects of our teaching mission (both classroom instruction and one-on-one work) as well as to Institute-level interdisciplinary initiatives.

In line with these priorities, we have appointed three new assistant professors to start in Fall 2010: Dan Margalit in Geometry and Topology, Karim Lounici in Statistics and Josephine Yu in Algebra and Combinatorics. See page 8 for profiles of these new faculty members.

Our staff is a tremendous resource for the School and has been especially helpful to me during this first year. I'm delighted to report that Justin Filosea, SOM IT Senior Systems Administrator, was recently awarded an Institute-wide Outstanding Staff Performance Award. See page 20 for a profile of Justin.

Last fall, the Institute committed an additional 6,000 square feet of space in the ground floor of the Skiles building to the School. A renovation plan was developed during the spring and construction will take place over the summer and early fall. We will gain nine new offices, two large seminar rooms, a lounge and space for public gatherings. On the second floor of Skiles we will also be renovating several small offices into larger faculty offices.

Finally, the School is expanding outreach in order to have more extensive interactions with our alumni. I've met many of you over lunch and at the High School Math Competition and we hope to see many more of you at Homecoming. We're planning an undergraduate research poster session and reception, 4:00-6:00 p.m. on Friday, October 8th, in the Skiles building.

I am very pleased to have come to Tech and I look forward to the many exciting developments to come. I hope you will enjoy hearing about them and perhaps even get involved. We welcome your participation.

Best wishes,

*Doug Ulmer
Professor and Chair*

SOM Statistics Spring 2010

Faculty	58
Emeritus Faculty	13
Academic Professionals	3
Retired Academic Professionals	2
Instructors	2
Visitors and Postdocs	21
Staff	11
Graduate Students	111
Undergraduate Students	163

Frank O. Spain or “Second and Five”

by Richard Duke

The first issue of the ProofReader featured a picture of Lyman Hall, Georgia Tech’s first professor of mathematics and second president. “Captain” Hall is justly famous, but you may not have heard of the second member of the mathematics department, Frank O. Spain.

Spain had been a cadet at the South Carolina Military Academy, now the Citadel, when Hall, before coming to Georgia Tech, had been one of the six faculty members at that small institution. Hall would later hire two more of his Citadel students; mathematics professor William Jennings, who happened to be the brother of Hall’s wife, Anne Toomer Jennings, and English professor Kenneth Gordon Matheson, who would become Georgia Tech’s third president.

Spain had taught at schools in South Carolina for two years and for one year had been commandant of cadets at the Georgia Military College in Milledgeville (a post that Matheson later held). He joined the Georgia Tech faculty in 1889, one year after the Institute opened its doors. Hall and Spain constituted the entire mathematics department for the next five years. Nonetheless, Spain is best remembered for his connection with early Georgia Tech football!

The first Georgia School of Technology football team was fielded in 1892. It was coached by physics professor E. E. West and included Frank Spain. Official records next list as coaches for the 1893 and 1894 teams both Frank Spain and Lt. Leonard Wood, later of *Rough Riders* fame, *Military Governor of Cuba*, *Army Chief of Staff*, and *Governor General of the Philippines*.

At the time Wood was a military surgeon at nearby Fort McPherson. The rules being somewhat loose, both Spain and Wood played on the 1893 team as well, with Wood as left guard and captain and Spain at center. That team remains famous as the first to beat the University of Georgia.

The game, which Georgia Tech won by a score of 28 to 6, was, however, more than a little controversial. The people from Athens complained that Wood, then over 30, was not really affiliated with Georgia Tech (although at least one person claimed that Wood had paid his matriculation fee to Captain Hall, who “understood the situation,” and that he did so to use the school’s shops to learn how to make splints and other items useful to a military surgeon).

Then there was the fact the referee was the brother of the trainer for the Atlanta team, a man by the name of Nourse, who was also a member of the team. The Georgia Tech fans pointed out, on the other hand, that the UGA team included a paid professional trainer. In any case, the win is fondly remembered among Georgia Tech faithful, and in 1935 the ANAK Society placed a plaque at Grant Field with a list of the players, including Wood and Spain.

In the fall of 1894 the Constitution reported that Spain was leaving Georgia Tech to join a theatrical troupe, describing him as “one of the best known young men in the city.” After appearing in a few roles in New York, he returned to Atlanta and became a representative for The American Book Company, an early publisher of textbooks, including the famous McGuffey readers and at least one of the algebra texts by Lyman Hall.

In 1901 he returned to teaching at the new University School for Boys in Stone Mountain. Mrs. Spain’s name appeared often in the society pages of the Constitution, in descriptions of tea parties and bridge games, and in connection with the affairs of the Tenth Street School, attended by Frank O. Spain, Jr. At one point Mr. and Mrs. Spain appeared before the city Park Board to urge improvements in Piedmont Park along the Tenth Street side. In 1915 they moved

to Florida, where Frank went into banking and eventually became a public utilities executive.

Epilogue:

Since Spain left Georgia Tech just before the start of the fall term in 1894, Lyman Hall had to find a temporary replacement quickly, and he came up with D. Jennings Lucas. The evidence suggests that Lucas, the department's third member who had graduated from the Citadel the previous year, was, in fact, Mrs. Hall's nephew. Lucas served for one year and died of typhoid fever just five years later.



Editor's Note: Professor Emeritus Richard Duke served as an Interim Chair in the School of Mathematics in 1999–2002. He received an Institute Outstanding Service award in 2002. Professor Duke retired in 2004 and is working on *History*

of Mathematics at Georgia Tech, the First One Hundred Years.

Faculty Meeting Minutes from 1889

President's Office,

March 1st, 1889.

All of the faculty met at 4 P.M. Minutes read and adopted. The President requested professors to submit descriptions of their departments and courses of study to be pursued therein.

Prof. Hall moved that candidates for the apprentice class be required to pass an examination in Mathematics as follows: Arithmetic, complete. Algebra; Fundamental operations including, addition subtraction, multiplication, division factoring, greatest common divisor, Least common multiple. Carried.

Adjourned,

Lyman Hall.
Sec.



Lyonia's Mushroom Billiards

by Michael Loss

It has been customary to divide dynamical systems into two classes; the integrable ones whose motion is regular (for example, uncoupled harmonic pendulums) and the very irregular ones whose motion can only be studied through statistical means. Regular motion as well as chaotic motion persists under small changes of the system. The first goes under the name of Kolmogorov-Arnold-Moser (KAM) theory and the second goes under the name of chaos theory. These theories represent two of the major mathematical discoveries of the twentieth century.

One should consider these two situations as extremes, and naturally, one would expect in 'most' dynamical systems that both situations occur simultaneously. For certain initial conditions, the motion should be regular and for others, the motion should be chaotic. One rephrases this by saying that the phase space of the dynamical system, that is, the set of all possible states of the system, breaks up into subsets. In some the motion is regular; in others, chaotic.

These kinds of phenomena have been seen in a great many numerical simulations. The regular motion forms islands in a chaotic sea. Close to the islands the motion is intermittent, i.e. something "between" regular and irregular. Neither of the methods, KAM theory nor chaos theory, are able to describe such behavior. Thus, this raises the fundamental question of how to describe the boundary between the stable islands and the chaotic sea. As so often happens in such situations, progress comes from examples that display the phenomena, that are easy to visualize and that are amenable to rigorous analysis.

Our School of Mathematics Regents' Professor Leonid (Lyonia) Bunimovich, pictured right recently discovered such systems and named them "Mushroom Billiards".



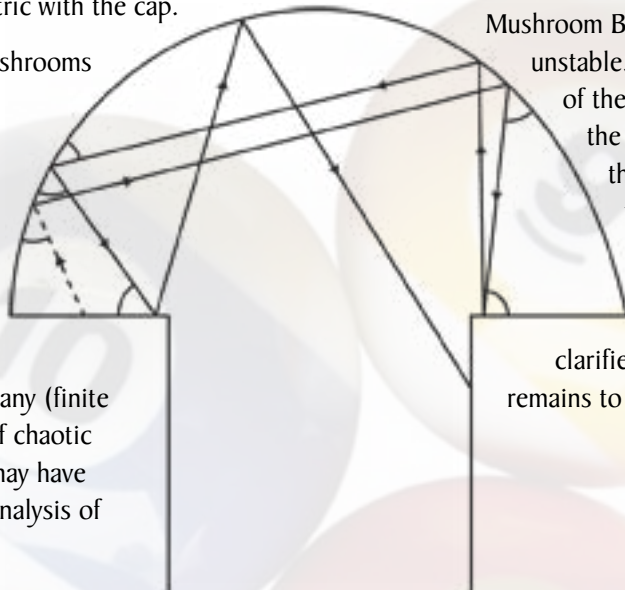
We all are familiar with billiards and mathematicians study them in a somewhat idealized form. The ball is really a point and 'rolls' frictionless; once it moves, it keeps the same speed forever. If it hits the rim of the billiard table (the boundary), it reflects according to Snell's law; the angle of incidence is the same as the angle of reflection. The phase space consists of all the possible positions and velocities of the ball.

Billiards have been well studied and Lyonia, among others, has made seminal contributions to this subject. Very roughly speaking, the motion of a ball in a strictly convex region (think of a circular pool table) is regular. One of his major results is that if one straightens the boundary of a convex pool table a tiny bit, then the motion is completely chaotic. The ball, over time, will come as close as one likes to any point in the phase space. In fact, the motion is ergodic; the time the system spends in any region of phase space is proportional to the volume of that region. Thus, either the motion is completely regular or it is completely irregular.

Mushroom Billiards do not exhibit this either/or behavior. The simplest symmetric two-dimensional Mushroom Billiard consists of a semi-circular cap placed on top of a rectangular stem. The billiard in such a mushroom has

exactly one chaotic component and one regular island. This regular island consists of all orbits that never leave the cap, while the chaotic component consists of the orbits that visit both the cap and the stem of the mushroom. One of the most difficult tasks in dealing with dynamical systems with divided phase space is to understand exactly what the boundary between the islands and the chaotic seas looks like. For Mushroom Billiards, this boundary is very simple. It consists of all such billiard orbits whose straight part of the trajectory is tangent to a circle that is tangent to the vertical sides of the stem and concentric with the cap.

By gluing various mushrooms together and using elliptic (instead of circular) mushrooms, Lyonia constructed examples of dynamical systems where any (finite or infinite) number of islands coexists with any (finite or infinite) number of chaotic seas. These islands may have arbitrary sizes. The analysis of



Mushroom Billiards demonstrated that, loosely speaking, anything is possible and the reality is much richer than expected.

Mushroom Billiards are now one of the favorite models for physicists to use when studying classical and quantum properties of Hamiltonian systems. Various physics labs have used atomic dynamics and microwaves to study Mushroom Billiards. In 2006, Mushroom Billiards were featured on the cover of the *American Mathematical Society Notices* and in 2009, they were on the cover of *Physical Review Letters*.

One should remember, however, that Mushroom Billiards are structurally unstable. Small perturbations of their boundary destroy the simple structure of the boundary between the regular islands and the chaotic seas. Therefore, although Mushroom Billiards clarified some things, much remains to be done.

New Faculty



Douglas Ulmer
Chair and Professor,
Summer 2009

Professor Ulmer began his appointment as School Chair and Professor of Mathematics

effective July 1, 2009. He comes to us from the University of Arizona, where he began his tenure there as an Assistant Professor in 1991 and progressed through the ranks to become Professor of Mathematics. His administrative responsibilities at the University of Arizona included serving as the Director of the Department of Mathematics' VIGRE program (Vertical InteGration of Research and Education) and as the Associate Head for the Graduate Program. He continues to be an active research mathematician working in algebraic geometry and number theory.



Anton Leykin
Assistant Professor,
Fall 2009

Professor Leykin is a computational algebraic geometer and comes to Georgia Tech from the University of Illinois at Chicago,

where he was a Visiting Assistant Professor. He received his PhD in 2003 from the University of Minnesota and held a postdoctoral position there from 2006 to 2008. His research interests include computational commutative algebra, algebraic geometry and numerical analysis.



Brett Wick
Assistant Professor,
Fall 2009

Professor Wick received his PhD in Mathematics from Brown University in 2005. His post doctoral positions

have included an Assistant Professorship at Vanderbilt University, a Wallenberg Postdoctoral Fellowship at the Swedish Royal Institute of Technology, the Jerrold E. Marsden Postdoctoral Fellowship at the Fields Institute and, most recently, a Palmetto Assistant Professor position at the University of South Carolina. His research interests include harmonic analysis, functional analysis and operator theory.



Karim Lounici
Assistant Professor,
Fall 2010

Professor Lounici received his PhD in Applied Mathematics in November 2009 from the University of Paris VII and is a

graduate of the *École Normale Supérieure*. Most recently, he has been a post-doctoral research fellow at Cambridge University. Karim's research is in mathematical statistics. More specifically, he studies machine learning and estimation procedures in high-dimensional models.



Dan Margalit
Assistant Professor,
Fall 2010

Professor Margalit comes to us from Tufts University where he was a tenure-track assistant professor. He

received his PhD in 2003 from the University of Chicago and held a post-doctoral fellow position at the University of Utah for five years. Dan was awarded a National Science Foundation individual investigator grant in 2007, a Sloan Fellowship in 2009 and an NSF CAREER award in 2010. His research interests include geometric group theory and low-dimensional topology.



Josephine Yu
Assistant Professor,
Fall 2010

Professor Yu received her PhD in 2007 from the University of California at Berkeley. She

held post-doctoral positions at MIT and the Mathematical Sciences Research Institute in Berkeley and was awarded an NSF Mathematical Sciences Postdoctoral Research Fellowship in 2008. She brought that fellowship to Georgia Tech in January 2010 to work with Professor Matt Baker. Josephine's research is in tropical geometry. This field is a combinatorial, piecewise-linear version of algebraic geometry with applications in statistics, representation theory and commutative algebra, as well as in combinatorics and algebraic geometry.

Promotions—To Associate Professor with Tenure



Yuri Bakhtin



Michael Westdickenberg

Confessions of a Non-Technophile

by Doron Lubinsky

I am not a technophile. I haven't yet learned how to send a text message on a cell phone, so the prospect of learning how to use a Personal Response System (PRS), or clicker, in class was not appealing. After nearly a semester of use, I cannot claim to have mastered it, but clickers are no longer so foreign or frightening.

The PRS allows one to collect instant answers to multiple-choice questions from classes of any size. It can even handle some forms of text answers. It comes up with a bar chart of the percentage of correct answers, allowing professors to see immediately if students have absorbed new ideas. The answers are recorded against students' individual ID's, and can be used as part of a class grade. They also encourage class attendance. In an age where class notes are often posted online, students can sometimes see what was taught in class without attending.

The devices are quite simple. Students purchase a PRS, about the size of a calculator, from the bookstore and can use it for several subjects. Most students in my class have already used their PRS for physics or chemistry. The professor needs a receiver that looks like a flash drive. For some versions of the software, the receiver can be plugged into existing computer equipment in the classroom. In my case, software was downloaded onto my laptop, and then I plug in the receiver, just like a flash drive.

The actual questions are displayed on screens in the classroom. Students first register their clicker and then submit their responses by pressing A, B, C, D, or 1, 2, 3, 4. True to form, I once messed up by displaying my answer options as 1, 2, 3, 4, but recording the correct answer as B. On that occasion, most of my students submitted the correct answer as 2, but the program, which was expecting B, graded them as wrong. Surprisingly, it was not so difficult to fix the mess.

I have benefited greatly from the patient tutoring of Chaohua Ou of the Center for Enhancement of Learning and Teaching (CETL). Chaohua has gently coached me through the process of generating a class roster, setting up questions for class, registering answers and exporting the grades. Tech is lucky to have such dedicated support staff.

On the whole, I am happy to have started to learn the technology. It has improved my class attendance and has allowed me to gauge the extent to which students grasp recently taught material. It doesn't need to be a major part of the grade, nor does it take up too much class time or constitute a major expense for the student.

Finally, it has also made me feel less threatened by this generation of graduate students, who seem able to use multiple sources of technology in their teaching with the greatest of ease!



Editor's Note:
Professor Lubinsky
is the SOM
Undergraduate
Coordinator.

You Want to Teach? Developing Teaching Assistants

by Klara Grodzinsky and Cathy Jacobson

Every term at Georgia Tech, approximately seventy percent of freshmen and sophomore undergraduates are enrolled in the first two years of required mathematics courses. Most of these courses include a lecture component and a recitation component. The School of Mathematics (SOM) employs graduate and undergraduate teaching assistants (TAs) each term to instruct Tech's undergraduate students.

The majority of the TAs serve as recitation instructors who conduct the problem solving sessions. A few of the more experienced graduate TAs serve as lead instructors in charge of lecture sessions and grade assignment.

Given our global student body, the SOM Instituted a program in the fall of 1995 that would help international graduate students understand American classroom culture as well as achieve greater clarity.

The effort, led by Cathy Jacobson, an English for Speakers of Other Languages Consultant (ESOL), was well received and resulted in the creation of credit bearing classes, specifically geared toward our international students. However, there was still a large group of domestic TAs without targeted support, particularly those who were first-time teaching assistants.

So, in the fall of 2000, Rena Brakebill, Klara Grodzinsky and Cathy Jacobson piloted a TA Development Seminar in order to provide uniform training to all of our new TAs. It gained the support of our faculty and we created a mandatory course called *Mathematics TA Development Seminar*. Beginning with the Spring 2001 term, every new TA in the School of Mathematics has been required to attend this weekly seminar.

In addition, an August workshop for incoming international graduate students was begun in 2004 to provide extensive communication and presentation practice as well as a thorough cross-cultural orientation to American university life. This year the incoming domestic graduate students will also attend the portion of the workshop titled "Survival 101". All will be introduced to the SOM's guidelines on how to

conduct their first class, plan their first week's recitations and proctor and grade exams.

In the fall of 2005, the Mathematics Teaching Development Seminar won the statewide Board of Regents' Excellence in Teaching Award for the training of teaching assistants. Since then, our program has been a model for other departments on campus. In consultation with teacher trainers across campus, the Center for the Enhancement of Teaching and Learning (CETL) also created an Institute-wide training course for undergraduate TAs in 2005, and in 2006 expanded their offerings to include graduate students. The SOM faculty and experienced graduate TAs participate on CETL's TA Advisory Committee where TA trainers from various departments meet to discuss

their ongoing programming and implications for supporting the career development of graduate students who plan to remain in the academic environment.

The SOM's TA Development Seminar presents material through small group discussions, video viewings, speakers and microteaching exercises. Constant mentoring during the first term of teaching is the touchstone of the training program. Every new TA is videotaped in his or her recitation class, and we spend



Klara Grodzinsky



Cathy Jacobson

time watching these videos with each TA to provide an evaluation and suggestions for improvement. The program also features speakers from the Dean of Students office and the Success Center as well as SOM faculty and outstanding experienced TAs. All first time TAs in the School of Mathematics are also required to administer and report on the student midterm evaluations.

Our experienced TAs report that the TA development program and the classroom experience enhance their ability to balance their work/study lives, to present material in a cogent way and to deal with grumpy students...all of which are useful when interviewing for a job. Graduate TAs who have successfully completed the seminar are encouraged to further their

teaching skills by attending CETL seminars and eventually becoming a lead instructor. Every lead TA has a faculty teaching mentor who acts as a teaching resource and, in particular, helps them make the transition from recitation TA to lead instructor.

Each year our best TAs are honored at the SOM annual TA Appreciation Reception, which is entirely funded by the faculty and staff. We also nominate two graduate students and one undergraduate student each year for the CETL/BP Outstanding TA Award. For each of the past five years, at least one of our nominees has won this highest Institute award for TAs. (See pages 18, 19.) It has been a privilege to work with the best TAs on campus, and we look forward to working with our new TAs in the fall.

Mathematics Conferences and Events at Georgia Tech

June 2009–June 2010



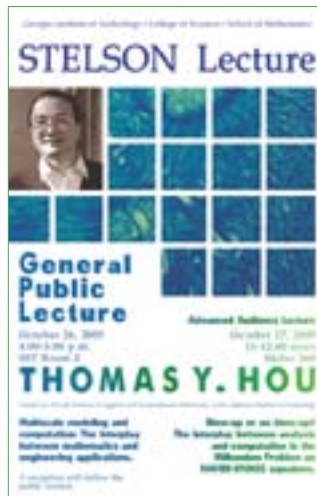
September 18, 2009 College of Sciences' Reception Honoring Incoming and Outgoing Mathematics Chairs (L to R: Paul Houston, Tom and Milie Trotter, Laura Hollengreen and Doug Ulmer)



October 24, 2009

Theory Day

This gathering of researchers and students in theoretical computer science was held in conjunction with the 50th Annual Institute of Electrical and Electronics Engineers (IEEE) Symposium on Foundations of Computer Science and the 20th Anniversary of the Algorithms, Combinatorics, & Optimization Program at Georgia Tech.

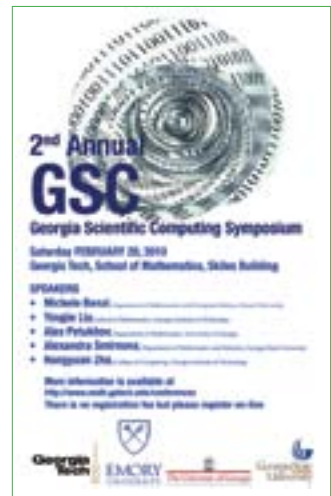


October 26, 2009

Stelson Lecture

Professor Thomas Hou, the Charles Lee Powell Professor of Applied and Computational Mathematics and the Director of the Center for Integrative Multiscale Modeling and Simulation at the California Institute of Technology, delivered two talks; *Multiscale Modeling and Computation: The Interplay Between Mathematics and Engineering Applications* and *Blow-up or No Blowup? The Interplay Between Analysis and Computation in the Millennium Problem on Navier-Stokes Equations*.

Visit www.math.gatech.edu/news/thomas-hou-delivers-2009-stelson-lecture to view his lecture.



February 20, 2010

Georgia Scientific Computing Symposium

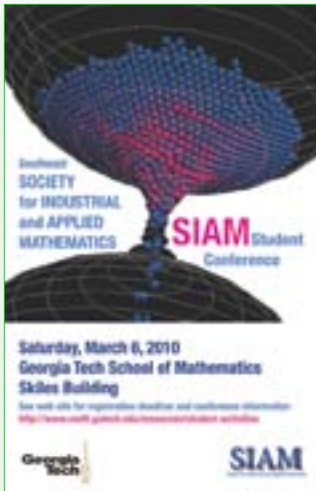
The purpose of the Georgia Scientific Computing Symposium (GSC 2010) was to provide an opportunity for professors, postdocs and graduate students in the Atlanta area to meet in an informal setting to exchange ideas and to highlight local scientific computing research.



February 27, 2010 **Seventh Annual Georgia Tech High School Mathematics Competition Participants**

Mathematics Conferences and Events at Georgia Tech

June 2009–June 2010



March 6, 2010

Southeast SIAM Student Conference

The Georgia Tech student chapter of the Society for Industrial and Applied Mathematics (SIAM) hosted the Southeast SIAM conference. It was an extension of the ACES (Auburn, Clemson, Emory, and South Carolina) Workshop that has been held annually by these universities since 2006. Like the ACES Workshop, this conference is an opportunity for graduate students to present their research in applied mathematics and related fields as well as to meet with other graduate students from different universities and departments.

Organizing Committee: Huijun Feng, Sarah Fletcher, Huy Hyunh, Yan Shu and Xiaolin Wang

March 6, 2010

Mathemagics: the Art of Mental Calculation with Professor Art Benjamin, Harvey Mudd College, sponsored by Club Math and Pi Mu Epsilon.



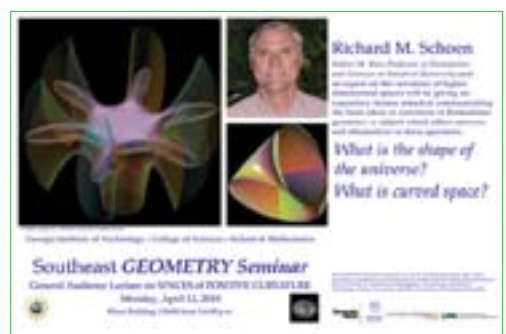
March 25–28, 2010

26th Southeastern Analysis Meeting The Southeastern Analysis Meeting (SEAM) promotes interaction between researchers and encourages research and education in the field of analysis. The main purpose of this conference is to bring together experienced researchers, junior faculty and graduate students to discuss recent work and advances in Operator Theory, Classical Complex Analysis and Harmonic Analysis, Function Theoretic Operator Theory and related areas.

April 12, 2010

Southeastern Geometry Seminar

The Southeast Geometry Seminar is a series of semiannual one-day events focusing on geometric analysis. These events are hosted in rotation by Georgia Tech, Emory, University of Alabama at Birmingham and University of Tennessee at Knoxville.



Awards June 2009–June 2010

Faculty and Staff:

July 2009



Professor Matt Baker was notified last summer that he had been selected as the 2010 recipient of the Board of Regents' Teaching Excellence Award for faculty at research universities. This award is the Regents'

highest honor for faculty in Georgia's public colleges and universities. He was honored at the University System of Georgia Foundation's Sixth Annual Excellence Awards Celebration in March 2010. Professor Baker was commended for his undergraduate and graduate teaching, the success of his research students and his outreach to high school and community groups. He inspires his students and amazes his colleagues with his use of magic to illustrate mathematical concepts. In addition to training graduate students, Professor Baker regularly involves his undergraduate students in research and helps them present their work at conferences and publish in professional journals. He was the faculty advisor for the competitive Putnam Math Team in 2006–2008. He also serves as the coordinator for the SOM Research Experiences for Undergraduates (REU) program. Professor Baker's commitment to his students has not kept him from doing extensive research of his own. For a more in-depth article on Professor Baker, please see his Profile in the 2008 issue of the ProofReader.

August 2009

Professor Brett Wick has received a Humboldt Research Fellowship for Experienced Researchers in recognition of his scientific



work in complex function theory. The candidates are selected solely on the basis of their academic record. The most important criteria for assessment are: academic publications in

internationally reviewed journals and publishing houses, statements on the candidate's academic profile and potential contained in the expert references, and the academic quality and feasibility of the research proposal.

The fellowship is for a period of 18 months. Professor Wick plans to use his Fellowship to spend several semesters at the University of Paderborn, where he will be hosted by Professors Sandra Pott and Birgit Jacob.

September 2009

Professor Prasad Tetali is part of a team that was awarded \$1.08 million in National Science Foundation funding over the next three years to pursue research in Random Processes and Randomized



Algorithms. The team includes Tetali, Professors Santosh Vempala, Dana Randall, and Eric Vigoda from Tech's College of Computing, and Professor Daniel Stefankovic from the University of Rochester's Computer Science Department. Their project focuses on applications of randomized algorithms and random sampling to rigorously address problems across several disciplines including computer science, physics, biology and mathematics.

Awards June 2009–June 2010



The American Mathematical Society selected **Dana Randall**, Professor in the College of Computing and Adjunct Professor in the School of Mathematics, to deliver the 2009 Arnold Ross Lecture. She gave her

lecture, *Domino Tilings of the Chessboard: An Introduction to Sampling and Counting*, on October 29, 2009 at the National Science Center/Fort Discovery in Augusta.

February 2010



Professor Maria Westdickenberg has been awarded a Sloan Research Fellowship. The Sloan Research Fellowships seek to stimulate fundamental research by early-career scientists and scholars of outstanding promise. These two-

year fellowships are awarded yearly to 118 researchers in recognition of their distinguished performances and unique potential to make substantial contributions to their field.

April 2010



Congratulations to **Justin Filoleta** of the SOM IT team who received an Outstanding Staff Performance Award at the campus wide Faculty-Staff honors luncheon on April 15th. Justin joins a group of exceptionally dedicated SOM staff

who have previously received this award: Sharon McDowell, Annette Rohrs, and Jackie Smythe. (See article on page 20.)

Two junior faculty in the School of Mathematics have been awarded National Science Foundation (NSF) CAREER grants: in April, 2010, **Professor Maria Westdickenberg's** proposal, *Combining Research on Dynamic Metastability and Hydrodynamic Limits with a Multifaceted Outreach Plan*, was funded and **Professor Brett Wick's** proposal, *An Integrated Proposal Based on The Corona Problem*, had been funded by the CAREER program in November, 2009.

Professors Westdickenberg and Wick received a great honor, as the NSF describes these as "The Foundation's most prestigious awards, which support junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations. Such activities should build a firm foundation for a lifetime of leadership in integrating education and research."

June 2010



Regents' Professor Robin Thomas

Congratulations to Robin Thomas who has been appointed Regents' Professor! This is the highest academic rank in the University System of Georgia

and it is awarded to faculty members who have distinguished themselves with a truly outstanding program of research and education over a period of years. In addition, only two professors from Georgia Tech can be appointed Regents' Professors each year.

Professor Thomas is the Director of the Algorithms, Combinatorics and Optimization (ACO) multidisciplinary program sponsored jointly by the SOM, the School of Industrial and Systems Engineering and the College of Computing. His mathematical interests include graph theory (including infinite graphs), combinatorics, combinatorial optimization and algorithms.

Graduate Students: December 2009

We are proud of our recent PhD graduate **Mitch Keller** who has won a Marshall Sherfield Fellowship that will start October 1, 2010. Keller completed his PhD in Mathematics under the supervision of Professor Tom Trotter in May, 2010. He will use his Fellowship to continue



research at the London School of Economics. Keller's research focuses on combinatorics, particularly finite partially ordered sets. His work to date has focused on areas such as linear discrepancy, online algorithms,

and interval partitions used for computing an algebraic property of monomial ideals known as Stanley depth.

Keller has been an exemplary PhD student. On top of his excellent academic performance, he has shown exceptional leadership skills through his involvement with graduate student life at Georgia Tech, the High School Math Competition and many other activities. He has been a great and generous friend to many students, faculty and staff at Georgia Tech.

March 2010

School of Mathematics recent PhD graduate **Alex Grigo** was a recipient of the 2010 Sigma Xi Best PhD Thesis Award. Grigo, whose advisor was Professor Leonid Bunimovich, defended his thesis, *Billiards and Statistical Mechanics*, in April 2009. Grigo also received the 2010 SOM Best PhD Thesis Award.



Grigo began his current postdoctoral fellowship at the Fields Institute in Toronto, Canada in July 2009. In addition, he was selected as one of two recipients of the 2010 Jerrold E. Marsden Postdoctoral Fellowship, which was established in honor of the Fields Institute's founding Director.

April 2010

Mitch Keller has received another accolade. The Graduate Student Senate voted to initiate an annual award honoring the most outstanding graduate student in terms of distinguished service and leadership. The award has been named the "Mitchel T. Keller Lifetime Achievement Award", with Keller the first to be so honored. (See Keller's article on page 21.)



ACO students **Sarah Miracle**, **Peter Whalen** and our SOM **Sara Fletcher** pictured left received honorable mention in the 2010 NSF Graduate Research Fellowship competition. The

program recognizes and supports outstanding graduate students in NSF-supported science,

Awards June 2009–June 2010

technology, engineering and mathematics disciplines who are pursuing research-based master's and doctoral degrees in the U.S. and abroad.

Huy Huynh was this year's winner of the Institute-wide 2010 CETL/BP Outstanding Graduate Teaching Assistant Award.



The 2010 SOM Top Teaching Assistant Award went to **Nan Lu**.

The 2010 SOM Best Math Lab Tutor Award went to **Liangda Huang**.



Ben Webb received the Festa Fellowship. This annual award, sponsored by Mr. and Mrs. John Festa, recognizes the SOM graduate student who has shown superior academic and leadership

skills. Webb was also the SOM's nominee for the 2010 CETL/BP Outstanding Lead Teaching Assistant Award.



Congratulations to **Shannon Bishop** who received the first SIAM Student Award! For a more in-depth article on Bishop, see her Profile in the 2009 issue of the ProofReader.



Yun Gong and **Luke Postle** received the College of Sciences Top Graduate Student Awards for superior academics and research from Professor and Graduate Chair Luca Dieci.



Breakfast Reception for Spring 2010 degree candidates on April 30, 2010 (From left to right) Undergraduates **Patrick Brandt**, **David Hollis**, **Stephen Garth**, Professor **Enid Steinbart**, Professor **Doug Ulmer**, **Kelly Robinson**, **Josh Moore**, **Carola Conces** and **Kathy Robinson**

Undergraduate Students:

December 2009



Georgia Tech's 2009 team again did very well in the Putnam Competition, placing 15th out of 439 schools. Ten of the team members scored over 17—an excellent achievement—and out of the 4,036

participants, two Georgia Tech team members,

Stefan Froehlich

(above) and

William Drobny

(right), had

scores that placed

them in the top 200 nationwide.

Congratulations

to the team and to

Professor Thang Le,

their advisor.



April 2010



Sunny Shah

was the winner of the Institute-wide 2010 CETL/BP Outstanding Undergraduate Teaching Assistant Award. He served the SOM as an undergraduate TA from Fall 2006 to

Spring 2010 when he graduated with a BS in Chemical and Biomolecular Engineering.



Kelly Robinson (BS Applied Mathematics, Spring 2010) and **Robert Brinson** (BS Polymer and Fiber Engineering, Spring 2010) received SOM Outstanding Top Teaching Assistant Awards from Klara Grodzinsky, TA Development Coordinator.

January 2010



Undergraduate student, **Michelle Delcourt**, was named a 2010 MAA Undergraduate Poster Session Prize Winner for her poster *Dessins and Manturov Bracket Shuffles* at the annual

combined American Mathematical Society/Mathematical Association of America meeting in San Francisco on January 15. The poster was based on her Research Experience for Undergraduates at Louisiana State University, and was one of many undergraduate posters presented. (See Delcourt's article on page 22.)

Congratulations to **Carola Conces** (right), the winner of the SOM Senior Mathematics Prize, and **Stefan Froehlich**, the winner of the SOM Undergraduate Mathematics Prize.



These awards were given to Conces and Froehlich at the Institute-wide Student Honors Luncheon and Awards Ceremony for their outstanding academic accomplishments and excellence in mathematics. Each student received \$500 from the scholarship fund established in 1993 to honor Professor J.C. Currie who taught at Georgia Tech for more than forty years.

Outstanding Staff Performance Awardee



Justin Filoseta

by Lew Lefton

I have had the pleasure of working with Justin for the past eight years. He began as a student worker in January 2002, and he immediately distinguished himself with his technical expertise and good attitude. When he completed his Bachelor's degree from Georgia Tech in Computer Science in 2004, I was happy to hire him in a full time position where he has progressed from being a System Support Specialist II to a System Support Specialist III in less than two years. Throughout his time here, Justin has shown an extremely high level of dedication and service to the School of Mathematics and the Institute as a whole.

As the lead system administrator for the School of Mathematics, Justin has broad responsibilities over a critical resource for one of the largest schools in the College of Sciences. On many occasions he has demonstrated brilliant creativity by developing simple and functional solutions to tricky technical challenges. His customer service focus is apparent every single day. He works proactively and communicates well with the entire school to keep our necessarily complex computing environment up and running efficiently. He is quick to diagnose and resolve difficult technical issues, and he regularly answers urgent emails in the evenings and on the weekends.

Silas Alben, Assistant Professor of Mathematics, wrote that Justin is "very good at explaining the subtleties and pros and cons of different solutions to problems. He has a problem-solving mindset and often thinks of creative solutions to issues that arise in my computations. He has written customized scripts for my computations that have made computing much easier. He provides computing services at a much higher level than was available at my previous institutions, NYU and Harvard. My visitors from other institutions have commented on the high quality of the computing staff in Georgia Tech School of Math, which Justin exemplifies."

Justin has continued to develop our automated install architecture and software packaging for Linux into a mature resource that is used widely across the campus. He also works hard to mentor and develop our student worker staff members, going above and beyond his job description, and he makes a positive impact on everyone with whom he interacts. Congratulations to a truly exceptional member of the Georgia Tech staff, one who most certainly deserved the Outstanding Staff Performance Award...Justin Filoseta!

Editor's Note: Lew Lefton is the IT Director for the School of Mathematics and the College of Sciences.

A Graduate Life: Mathematics and Campus Service

by Mitch Keller, PhD Mathematics, Spring 2010

I arrived at Georgia Tech in August 2004 after growing up in rural North Dakota and earning a BS in Mathematics at North Dakota State University. Although Georgia Tech's strength in combinatorics had made it a contender early in my graduate school search, I had almost decided against applying when Professor Evans Harrell, then the graduate coordinator, started recruiting me. He convinced me to visit Atlanta and I had such a positive experience that I decided to make Georgia Tech my new home.

When I first visited Georgia Tech I met many faculty members, but I did not meet the professor who would eventually become my advisor. That would not happen until my second semester, when I took a combinatorics course from Professor Tom Trotter and came to enjoy the mathematics he does. Five years later, I earned my PhD under his supervision.

My dissertation focuses on a parameter of partially ordered sets known as linear discrepancy. This parameter is related to determining "fair" total rankings of objects that are better compared through a partial order than through a total order. Dr. Trotter has been an incredibly supportive advisor and mentor. His vast experience as a teacher, scholar and administrator helped me navigate my many responsibilities on campus.

Outside of the School of Mathematics, I have been involved on campus in a number of ways. I took an active role in the Graduate Student Government Association and served as a senator, executive vice president and president. In these roles, one of my primary activities was to work to maintain quality health care insurance for graduate students. I was also involved with the Honor Advisory Council's efforts to promote academic integrity on campus and I helped organize the annual High School Mathematics Competition. These opportunities to serve the Tech community allowed me to work with a variety of individuals and

develop leadership skills that will be beneficial throughout my career. Although these activities probably deferred my graduation by a year, I would not trade the experiences for anything. (Fortunately, my advisor was supportive of these endeavors too!)

The next stage of my career will take me to the United Kingdom. As the first mathematician to receive a Marshall Sherfield Fellowship, I will spend the 2010–11 and 2011–12 academic years in the Department of Mathematics at the London School of Economics (LSE). My initial research efforts there will be to collaborate with Professor Graham Brightwell on questions in the combinatorics of partially ordered sets. However, LSE has great strength in combinatorics, and I hope to work with others in the math department (and perhaps across LSE). I also hope to visit other places in the UK and Europe to discuss mathematics and to experience the many other cultures.

Editor's Note: Mitch's Additional Honors and Service:

- K. Patricia Cross Future Leaders Award, 2009
- Festa Fellowship, 2006
- CETL/BP Outstanding Teaching Assistant Award, 2005
- VIGRE Fellowship, 2005–2010
- Managing Director of Mathematics Genealogy Project at North Dakota State University, Fargo, North Dakota. (www.genealogy.math.ndsu.nodak.edu)
- Pastry Chef Extraordinaire—We will miss your rhubarb pies!



An Undergraduate Student's Life

by Michelle Delcourt, Discrete Mathematics Senior



Club Math members—Back row: Paige Hoffman, Stephen Garth, Josh Anderson, Michiel Shortt; Front row: Martin Copenhaver, David Hollis, Michelle Delcourt

I have enjoyed my past three years immensely as a discrete mathematics major at Georgia Tech. To me one of the most important aspects of the School of Mathematics (SOM) is the balance of academic rigor with a sense of community. The atmosphere at Tech is such that within my first few years I have had the opportunity to interact with many undergraduate students, graduate students and professors. When I walk through the halls of Skiles, I know practically everyone and there is always a good conversation to be had. This sense of community promotes an academic discourse that I feel has facilitated my growth in the field of mathematics.

At a school of the caliber of Georgia Tech with its difficult courses and demanding professors, the social lives of students could be limited to solitary studying. However, through the very active “Club Math” in the SOM, undergraduate students form a support network and hold many events throughout the semester. We have had a number of lectures by professors from Emory, Harvey Mudd and Georgia Tech as well as talks by our members. In addition, we started math movie nights and had a Pi Day celebration to encourage excitement about math. We also have had more informal sessions with open discussions; so much of math is just being able to talk to other people.

There are so many people at Tech that are at the forefront of their field and so many things that are being discovered every day that it is really exciting to be a part of it. Experiencing the many opportunities in the SOM has reaffirmed that this is the type of community that I want my future career to be a part of down the road.

Editor's Note: Michelle's Honors and Service:

- Winner—2010 MAA Undergrad Poster Session in San Francisco, January 2010
- Club Math President and Puzzle Master
- College of Sciences Advisory Board
- Student Organizer and T-shirt Designer—GT High School Mathematics Competition, 2008–2010



Jack K. Hale (1928–2009)

In the early morning of December 9, 2009, at Atlanta's Emory Hospital, a great man passed away, Regents' Professor Emeritus Jack K. Hale—a founding father of numerous areas of modern dynamics, a noble scholar and teacher, and a mentor and dear friend to many around the world. He is survived by his wife of sixty years, Hazel Reynolds Hale. Professor Hale was born in Carbon Glow, Letcher County, Kentucky. After graduating from Berea College in Berea, Kentucky, he attended Purdue University where he received his PhD in Mathematics.

Professor Hale spent many years teaching and doing research in mathematics at Brown

University and came to Georgia Tech in 1988. He was a co-founder of the Center for Dynamical Systems and Nonlinear Studies (CDSNS) and served as the director from 1989–1998. Some of his awards were the Chauvenet Prize, a Guggenheim Fellowship, a British Carnegie Fellowship and the Sigma Xi sustained Research

Award. Among his professional memberships were Corresponding Member of the Brazilian Academy of Science, Honorary Fellow of the Royal Society of Edinburgh and Foreign Member, Polish Academy of Science.

He received honorary degrees from Ghent, Belgium; Stuttgart, Germany; Technical University of Lisbon Portugal; Rostock, Germany and Clark University, Worcester, MA. One of his most rewarding accomplishments was working with at least forty-three PhD students, including the following Georgia Tech alumni: Jose Arrieta, Alexandre Carvalho, Gwendolen Hines, Bradley Lehman, Sergio Oliva, Joao Pinto, José Salazar-Gonzalez and Marion Weederemann.



Professor Nathaniel Chafee's Recollections:

"So far as I know, my association with Jack is of longer duration than anybody else's at Georgia Tech. In fact, during the years 1964–1966, Jack supervised the preparation of my doctoral thesis in the Division of Applied Mathematics at Brown University in Providence, Rhode Island.

In the early 1970's, Jack Hale, his wife Hazel and I were attending a dinner party in Providence, Rhode Island. Somebody asked: What characterizes a good mathematician? What distinguishes his or her work from that of other scientists?

Jack's reply took the form of an unusual comparison. Think about the process of eating an artichoke, he said. One begins by peeling away the leaves, briefly enjoying the succulent matter on each leaf. The goal, however, is to arrive at the heart of the artichoke and eat it. That heart is the tastiest part.

When a good mathematician investigates a mathematical problem, he or she proceeds in a similar fashion. That

mathematician unerringly peels away all the extraneous features of the problem and exhibits the core truth underneath. In that same connection, I recall Jack often saying in reference to this or that mathematical problem, 'I want to know what's really going on'.

Professor Walter Leighton from the Mathematics Department at the University of Missouri in Columbia, Missouri and I were speaking of Jack Hale and Walter remarked, that, among all the mathematicians he had ever known, Jack was the most modest in proportion to his own achievements. How right Walter was!"

Professor Yingfei Yi's tribute:

"What made Jack such an admirable person goes far beyond his professional achievement. Being his student, colleague and close friend for the past twenty years, I had the great honor to witness his remarkable professionalism and dedication to work, his unselfishness and thoughtfulness to people, and his principles and persistence toward life. He never stopped working or helping the community and others even during the last remaining months of his life while battling a severe illness.

To this end, I would like to borrow a nickname that George Sell long used for Jack: 'The Grand Attractor'. To me, and I am sure to many who loved him, this is the best short description about Jack both as an outstanding scholar in our time as well as a superior person. He played a fundamental role in the development of the area of dissipative dynamics as well as in the entire

field. Many of us from around the world were attracted to the field because of him and he had tremendous impact on us all."

All of us at Georgia Tech's School of Mathematics will always remember Jack Hale for his mathematical talent and his warm, generous disposition. He will be greatly missed.

Editor's Note: Nat Chafee is currently a SOM Associate Professor Emeritus. Yingfei Yi is a SOM Professor and his full article can be found on the Dynamical Systems Magazine website: www.dynamicalsystems.org/ma/ma/display?item=336

For other information on Professor Hale's career experiences, his legendary life and his unique character, see the recent obituary article written by Professors Shui-Nee Chow and John Mallet-Paret in the *Journal of Dynamics and Differential Equations* Special Issue 2, Volume 22 (2010).

Bill Ames (1926–2009)

by Fred Andrew and Bill Green

The faculty, staff, students and friends of the School of Mathematics were deeply saddened by the passing of Bill Ames, who died of cancer on August 3, 2009. Bill joined us as a Professor of Mathematics in 1975, served as Director of the School of Mathematics from 1982 to 1987, and retired at the rank of Regents' Professor in 1991. He served on the Editorial Board of the *Journal of Mathematical Analysis and Applications* (JMAA) for many years and as co-editor-in-chief beginning in 1991. In 2007 JMAA published an excellent tribute to Bill to mark his 80th birthday. This article traced his



personal and professional life, including his service in the United States Navy during World War II and the Korean War; his education at the University of Wisconsin; his positions as senior engineer at DuPont and professor in engineering, mathematics, statistics and computer science at the University of Wisconsin, the University of Delaware, the University of Iowa and Georgia Tech. It described his leadership in applied and computational mathematics, his many visiting positions,

his more than thirty doctoral students, more than one hundred scientific articles and nearly twenty books.

Those of us here, especially those “of a certain age,” have more personal memories. We remember his devotion to his family and his advocacy for women in mathematics. He collaborated professionally with his daughter Karen, and of his ten doctoral students at Georgia Tech (Martha Abell, Danny Arrigo, Bob Boisvert, Theresa Bright, Martin Brown, Vince Ervin, Jim Peters, Vince Postell, Pam Richards and Waltraud Rufeger), four were women. He was also the

doctoral advisor of Martin Brown, the first African American student to earn a PhD in Mathematics at Georgia Tech. We remember how widely he traveled, professionally and for pleasure, and the many international collaborators who visited Georgia Tech to work with him. Before email, this network of collaborators generated plenty of paper mail, and we remember him sharing the foreign stamps he received

with the collectors among the faculty and staff. On the lighter side, we remember the evening applied probability seminars and his aversion to shortening “School of Mathematics” to “School of Math.”

We recognize his continuing impact on the profession and on the School of Mathematics through his students, collaborators and the current faculty members he hired—Luca Dieci, Evans Harrell and Michael Loss—while he was Director of the School of Mathematics.

Martha Abell (MS Applied Mathematics 1987; PhD Mathematics 1989), Chair of the Department of Mathematical Sciences, Georgia Southern University, shared the following memories of Professor Bill Ames.

“My memories of Professor Ames revolve around his encouraging nature towards his students and his interest in seeing more women enter the field of mathematics. I’ll never forget how he encouraged me when I was trying to decide where to take a position as I was completing graduate school. He told me that he thought Georgia Southern was a promising destination

because of its recent growth. Twenty-one years later as our institution nears a record enrollment of 20,000 students, I would say he hit the nail on the head with that sage advice. I also went to him early in my career when a colleague of mine and I were interested in publishing a book about Mathematica. He contacted his editor at Academic Press (who just happened to be looking for a project like ours), which helped to launch a long and productive relationship for us with their company. Professor

Ames had a lasting impression on my career. With his guidance, I gained the confidence to pursue a PhD in mathematics, and with his encouragement and advice, I was able to accomplish much more than I would have ever expected over the years.”

Editor’s Note: Fred Andrew is a Professor and Associate Chair, and Bill Green is currently a Professor Emeritus in the School of Mathematics, Georgia Tech.



Alumni News and Memories

We hope that you have already received our invitation and marked your calendar for the School of Mathematics's open house on October 8th, the Friday afternoon of Georgia Tech's 2010 Homecoming weekend.

We would like to recognize three GT alumni who won the photo contest on page 6 of the 2009 ProofReader. See the answer at www.math.gatech.edu/outreach/alumni/proofreader



Elaine Hubbard (PhD Mathematics 1972), pictured left.

Darren Hunt (BS Electrical Engineering 1993, MS Management of Technology 1998)

Margaret Reimer Moore (BS/MS Applied Mathematics 1977/1979)

Margaret also sent a photograph below taken during spring quarter, 1980. She wrote, "To the best of my memory, Jeff Geronimo was the photographer. Maybe he remembers why he came to the third floor of the D.M. Smith building to get a picture of the math graduate students! And he must have interrupted a game of Hearts or Spades because four of us are holding playing cards."



Seated: Margaret Reimer Moore, Joy Herndon, Cindee Corthell Kueny. Standing: Bill Raddatz, Bruce Lynskey, Professor Steve Zemyan, Bob Boisvert, Glenn Cordingley, John Wright, Vince Ervin ("Bloke") and Charles Darrah. Steve's office was in D.M. Smith instead of Skiles, so we grad students claimed him as one of our own.

After completing my MS in Applied Mathematics in 1979, I stayed on campus another two years working at the Engineering Experiment Station (now called Georgia Tech Research Institute, GTRI), taking courses towards a PhD in Operations Research and teaching freshman Calculus classes. I was an alumna, a faculty member and a student all at the same time! I left Tech in 1981 to go to work for AT&T Long Lines in downtown Atlanta. I held a variety of technical sales support jobs at AT&T until my retirement last year. My husband Phillip thinks I should return to Tech to finish my PhD now that I'm retired, but I'm not convinced yet. Although my career didn't fully use the math training I received at Tech, it has helped me tutor my nieces and nephews in their high school and college math classes."



L to R:
Bruce Lynskey,
Margaret and
Phillip Moore



Martha Abell (MS Applied Mathematics 1987; PhD Mathematics 1989) is completing her term as Chair of the Southeastern Section of the Mathematical Association of America (MAA). She has also served the section

as Secretary/Treasurer, Chair-Elect and Chair and Georgia State Director over the past 12 years. She is a professor in the Department of Mathematical Sciences at Georgia Southern University where she has served as Chair of the department since Fall 2004. (See her memories of Professor Bill Ames on page 25.)

Congratulations to **Martin Jones** (PhD Mathematics 1990) who won the MAA Southeastern Section Award for Distinguished College or University Teaching of Mathematics in March 2010. Martin is a Professor of Mathematics at the College of Charleston (C of C).



Martin and a C of C student Ryan Parker wrote a paper titled *Contributions of Star Players in the NBA: A Story of Misbehaving Coefficients*, which was published in *Chance Magazine* this summer.

According to a posting on the C of C's website in Spring 2009, "Martin Jones teaches an 8:00 a.m. Introduction to Statistics class to people

who dread the very idea of an 8:00 a.m. Intro to Statistics class. Somehow, he's still one of the most popular professors on campus. That's because Jones exhibits a genuine passion for his subject that's nothing short of infectious."



Claudia Antonini, Jose Miguel Renom and daughters Maura and Milena Nicole

Congratulations to **Claudia Antonini** (MS Applied Mathematics 2000, PhD Industrial and Systems Engineering 2005) and her co-authors for the Best Paper Prize 2009 in Operations Engineering and Analysis given by the Institute of Industrial Engineers. The paper "Area Variance Estimators for Simulation Using Folded Standardized Time Series" was written jointly with Industrial and Systems Engineering Professors Christos Alexopoulos and David Goldsman from Georgia Tech, and James Wilson from North Carolina State University. She is currently Professor of Mathematics at *Universidad Simón Bolívar* in Caracas, Venezuela. Claudia writes that she recently organized the 23rd Jornadas Venezolanas de Matemáticas which was well attended with many Venezuelan and international presenters.



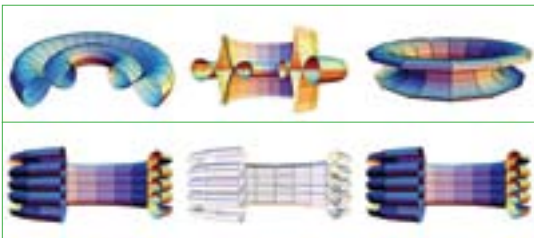
L to R: Lucio Antonini, (Claudia's father), Christos Alexopoulos, Claudia Antonini, James Wilson, Mrs. Wilson

Alumni News and Memories



Ryan Hynd (BS/MS Applied Mathematics 2003/2004) has been pursuing his PhD at UC Berkeley since the fall of 2004. He graduated in May of 2010 and was awarded a National

Science Foundation postdoctoral fellowship to continue his research at NYU's Courant Institute of Mathematics. His PhD thesis advisor was Professor Lawrence Craig Evans and Ryan's interest is in non-linear partial differential equations.



The images above come from a research poster titled *Classification of Rotational Figures of Equilibrium* that Ryan and fellow students Jeffrey

Elms and Roberto Lopez created while at Tech working closely with Professor John McCuan.

Nguyen Le Truong (MS Applied Mathematics 2007), pictured above, the first undergraduate student to receive an Institute-wide CETL/BP Outstanding Teaching Assistant award in 2005, is a PhD student at UC Berkeley. In March, he took a week-long break from studying by roughing it in Monument Valley and other national parks in the Southwest.

In 2003, Nguyen, a CS major and an undergraduate SOM teaching assistant, proposed to our Undergraduate Coordinator, Yang Wang, that the SOM host a high school mathematics contest. In February 2004, Nguyen Truong and three other student organizers, Stephanie Bent (BS Applied Mathematics 2004), Alan Michaels (BS Applied Mathematics 2003, MS Applied Mathematics 2003, PhD 2009 Electrical and Computing Engineering) and Patricia Pichardo (BS Discrete Mathematics 2002, MS Applied Mathematics 2005) turned Nguyen's idea into a successful annual recruiting event, the Georgia Tech High School Mathematics Competition (HSMC). This event takes place every spring. This year, 379 students, grades 6–12, participated in the HSMC.



Volunteers at the 2008 High School Mathematics Competition—Front: Stephanie Bent, Tom Morley, Patricia Pichardo; Back: Rena Brakebill, Jamil Karim (Patricia’s husband), Alan and Ashley Michaels

Patricia Pichardo (BS Discrete Mathematics 2002; MS Applied Mathematics 2005) “I am working as a Product Owner for CDC Software. I work with a development team in Shanghai to develop software that adds value to our enterprise resource planning offering. I got to visit them last November and had a blast meeting them, learning a little about the culture and overall getting work done. I will be visiting them in April for a couple of weeks and hope to get an opportunity to see the Shanghai Expo ‘10 (World’s Fair) and on to Beijing to see some of the more traditional sites.”



Contact us... We are eager to hear news from you! Tell us what you are doing now, reminisce about your days at Tech, or update your personal and contact information (degree and class, email address or snail mail address). We also appreciate photos!

Send your messages to editor@math.gatech.edu

Notes from the ProofWriters



Dear ProofReader,

We would like to think that you have been waiting feverishly for the current edition of our little journal and, upon its arrival, started reading it immediately.

Now you are reading the penultimate page of our third volume of the ProofReader. You have, or so we hope, the feeling of a slight sadness that occurs when finishing a good book.

Should you be in this emotional state, you have to thank or blame our editorial team. If you have been moved by the grace of some of the writing you have to thank Cathy Jacobson, who is our managing editor. If you have been struck by the beauty of the layout, you have to thank Janet Ziebell. If you are pleased with the topics covered, you have to thank Michael Loss, Doron Lubinsky and our Chair, Doug Ulmer. The real instigator of all of these emotions, however, is Rena Brakebill to whom we would like to dedicate this edition of the ProofReader.

Rena retired last year from Georgia Tech, after 27 years of working in the School of Mathematics. She started as an instructor in 1982 and in 1998, Rena trained with Associate Director David Ho as a class scheduler. After Professor Ho's retirement in 2000, Rena coordinated the scheduling team in addition to teaching large calculus classes. Matching a hundred or so classes with faculty and teaching assistants is a huge combinatorial puzzle with the added difficulty that the quirkiness of some of the components could not easily be incorporated into the algorithm.

Faculty members tend to underestimate the importance of this activity. The only time it enters our minds is when something goes wrong. Amazingly, under Rena's watch, it rarely happened. We have all learned to appreciate the depth of Rena's knowledge about Georgia Tech as a teaching institution. For every problem she could not solve herself, she knew whom to ask. As if this were not enough work, Rena was the main supporting advisor of our annual High School Mathematics Competition.

To a large extent the ProofReader is based on Rena's institutional memory; she keeps in touch with everybody—graduate and undergraduate students, faculty members and administrators. Fortunately for us, Rena volunteered to help with the current edition and we all hope that in the future we can continue to tap her memory for further stories for our little journal. We will miss her dearly.

Once more, if you want to give us feedback on the content of the ProofReader or any story related to the School of Mathematics, please do so at editor@math.gatech.edu

As always, we love to hear from you.

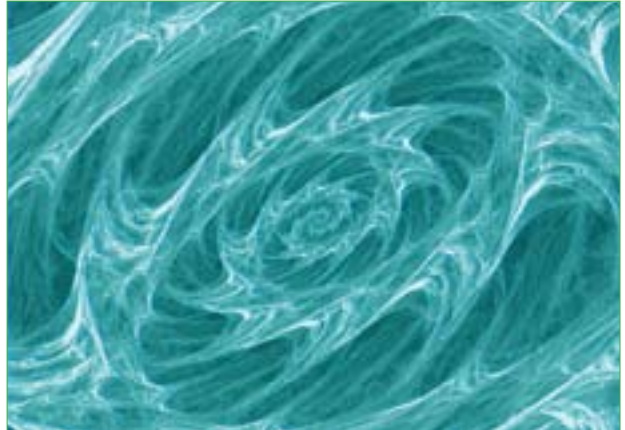
The Editorial Team

(L to R) Michael Loss, Janet Ziebell, Rena Brakebill, Cathy Jacobson and Doron Lubinsky



ABOUT THE COVER:
Michelle Delcourt generated some mathematical art that is featured on the cover of this issue. To see more

of her work, go to: www.prism.gatech.edu/~mdelcourt3/mypage/art.html



Why Make A Gift?

We hope that you have enjoyed reading about all the great activities in the School of Mathematics. Many of the activities are the result of volunteer work; they have direct impact on teaching and research, and many of them are in need of support.

The High School Mathematics Competition (HSMC) is run entirely by volunteers. In former years we have given out scholarships as prizes, but we may have to reduce the prize money as the corporate grant supporting the scholarships comes to an end. Any contributions towards HSMC prize money would help.

Today's economic environment is making it harder than ever for talented but financially needy students to earn a college degree. Undergraduate Scholarships would help these students tremendously.

As you all know, an important mission of the School of Mathematics is teaching. Besides the faculty, some of our students, undergraduates and especially the graduate students, are very much involved in teaching. Cash awards to recognize good teaching would be a great way to support them in this demanding endeavor and would underline the importance of good teaching.

A second important mission of our School is to create mathematical knowledge through

the research carried out with the help of our graduate students. Any support for graduate student research or travel would be appreciated. Having well-funded graduate fellowships would also be of great help in attracting top students to our graduate program.

Finally, a long-standing desire for which we would love to have funding is a named program for post-doctoral fellows. It is at this level where some of the real exciting research happens and it is, in many ways, critical for the future of the teaching of mathematics.

We're grateful for any help you can give, large or small, to any of the above-mentioned programs.

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