

A Message from the Chair

What a special and wonderful year it has been at Baylor University! Athletically, our teams have shined and there have been great individual accomplishments by many star athletes, including Robert Griffin III and Brittney Griner. Our teams, our coaches, our athletes have made all of us proud to wear the Green and Gold of Baylor Nation. Just before the start of the Baylor baseball season, my wife and I attended the annual Baylor baseball banquet. When I asked head coach Steve Smith how the team was looking, he replied "Right now, we're 0-0 and my team has a 3.15 GPA". It's wonderful to hear that, at Baylor University, our coaches emphasize academics **and** athletics – and they mean it!



Lance Littlejohn

The big rumor on campus for the past several months has been talk of a new football stadium on campus near to where the Brazos and I-35 meet. And now the big news has broken that we are one huge step closer to this reality, thanks to the unprecedented generosity of Elizabeth and Drayton McLane Jr.! It's controversial for sure, since we have many pressing needs on campus, but I love and fully embrace the idea of a new stadium. The city of Waco has made numerous transformative changes in the past five years and a new stadium will help further to invite new businesses and restaurants to the downtown area. Can you picture what both sides of the Brazos will look like in another ten years? Baylor and the city of Waco continue to work together on a new and close partnership that will ultimately benefit all of us in Central Texas.

We are in the midst of another busy, productive semester in the department. Besides teaching and research duties, our faculty is engaged in three searches which we hope will result in three more accomplished mathematicians joining our already solid group of faculty. I recently finished my annual faculty evaluations: during the calendar year 2011, the 20 tenured and tenure-track faculty published a total of 54 papers, an average of 2.7 papers per person. I can assure you that this ratio is one of the **highest** in the nation! And I continue to be very proud of the efforts and accomplishments of our faculty in the classroom. It is our aim to become a nationally ranked mathematics department – in both teaching and research - and we are certainly on the path to meeting this lofty goal.

The rest of this semester is full of exciting events in the department. On March 21, Baylor math alum and world-renowned economist Ray Perryman will speak in our third annual Life Experiences in Mathematics

**APRIL IS NATIONAL
MATHEMATICS
AWARENESS MONTH**

Check out our full April
lineup inside for special
events on campus all
month long!

series. Traditionally, April is National Mathematics Awareness Month in the United States so, to celebrate this month, we have several special lectures and events lined up for our students and faculty. Professor Robert Tubbs, a well-known number theorist and popular speaker from the University of Colorado will kick off events with a lecture on April 10. Professor Ronald Graham, the Irwin and Joan Jacobs Professor in Computer Science and Engineering at the University of California – San Diego and a member of the National Academy of Sciences will give two lectures in the fifth annual Baylor Lecture Series in Mathematics on April 12-13. On April 18, Seth Caplan and Dano Johnson, who produced and directed the hit math movie “Flatland” will be on campus to show this film and to talk about their new movie “Sphereland”, due to be released this summer. The evening of April 25 will feature a panel discussion with the Chihara brothers – Ted (a mathematician from Purdue), Charles (a philosopher from Berkeley), and Paul (a musician from UCLA) on the subject of creativity. Dr. Kevin Dougherty, from Baylor’s Department of Sociology, has kindly agreed to emcee this unique event. A full, and detailed, schedule of all of our April events is given later in this newsletter.

The \$100 Million [President’s Scholarship Initiative](#) continues to move towards its goal. Baylor alumni have stepped forward to help in this important drive and we would appreciate any help that our alumni can provide. Of course, we would be grateful if you would also consider adding to existing mathematics scholarships that we have, or, starting new endowed mathematics scholarships. We are especially grateful to several mathematics alumni who have recently made donations to our scholarships. On the subject of development, we have set several major fund-raising goals in our department. Specifically, we want to:

- (1) increase the number of mathematics scholarships in the department; the number of deserving undergraduate students always outnumbers the scholarships that our department has to offer. Information on current scholarships in our department can be found at our [Mathematics Scholarships](#) page.
- (2) endow several graduate assistantships in the department; this would give us the opportunity to be more competitive with other universities and allow us to nationalize and internationalize our applicant pool.
- (3) obtain three fully endowed chairs in the department within the next 10 years. Every top mathematics department in the country has endowed chairs; these chairs would help us significantly increase our profile and recognition in the United States. The department has hired very well over the years but we could make a significant leap forward if we had endowed chairs available to attract established, world-renowned teachers and researchers.
- (4) endow several visiting professorships in the department. Baylor mathematics faculty can benefit greatly by inviting research scholars and exceptional teachers from other institutions to visit our department for a semester or an academic year.

If you would like to help in any of these areas, please contact me at Lance_Littlejohn@baylor.edu or call at (254) 710-3165. Alternatively, you can contact Frank Shannon (Frank_Shannon@baylor.edu) or Rose Youngblood (Rose_Youngblood@baylor.edu) in university development.

Please keep in touch with us – better still, come and visit us! I would love to visit with you!

Best wishes,



Department News

Baylor Mathematics Graduate Student Coaches Guatemalan Math Team

Pedro Morales, a Ph.D. student in mathematics at Baylor, coached the Guatemalan Mathematics Olympiad team in the Ibero-American College Mathematical Competition, held in Quito, Ecuador this past October. There were 18 competing teams with a total of 48 contestants.

Pedro's team, consisting of Esteban Arreaga and Alejandro Vargas, did extremely well in the competition: both Esteban and Alejandro won a silver medal during the grueling two day competition.



Esteban Arreaga, Pedro Morales, Alejandro Vargas

Pedro, who originates from Guatemala City, has had considerable experience in coaching and training his country's national mathematics team. Lance Littlejohn, chair of Baylor's mathematics department, says "Pedro is an exceptional problem solver. I understand why Guatemala seeks his help with their young mathematical talent." After graduating in applied mathematics and electrical engineering from the Universidad de San Carlos de Guatemala, Pedro chose to come to Baylor, on advice from his Guatemalan friend and fellow Baylor mathematics graduate student, **Jose Franco**.

In 2012, both Jose and Pedro will graduate with their Ph.D. degrees in mathematics. Pedro is finishing up his thesis in mathematical physics, specifically about the Casimir effect and its applications, under the direction of Dr. Klaus Kirsten while Jose has written his thesis, under supervisor Dr. Mark Sepanski, on the applications of representation theory of Lie groups to partial differential equations. Littlejohn remarks that "both Pedro and Jose have been exceptional and exemplary students in our graduate program. Both are very talented young mathematicians with terrifically bright futures. I really hope they can help us create a Baylor-Guatemala pipeline in which we can attract their best and brightest students to study at Baylor."

Baylor Approves Secondary Major in Mathematics

In December 2011, Baylor University officially approved a secondary major in mathematics. The upshot of this move is that Baylor students outside of the College of Arts and Sciences can now study mathematics and earn a secondary major in mathematics. Before this initiative, it was essentially impossible for a student to major in two subjects that were offered in different colleges or degree programs on campus.

The idea of a secondary major was brought forward to departments last semester by Dr. Edward B. Burger, the 2010 Robert Foster Cherry Award winner for Great Teaching and currently Vice Provost for

Strategic Educational Initiatives at Baylor. Dr. Burger has been a strong advocate of promoting ways and means for Baylor students to obtain a broader education.



Ed Burger

Lance Littlejohn, chair of the Department of Mathematics at Baylor, remarks "Since I have been here at Baylor, I have had dozens of very bright, motivated engineering students lament to me that they wish they could earn a degree in mathematics alongside their engineering degree but were unable to because of Baylor's 'two-college rule'. This is terrific change in policy and a win-win situation for our students and various academic programs on campus. I can see that new bridges between campus colleges will be built as a result of this fundamental change."

Mathematics has long proved its value in academic disciplines outside of the College of Arts and Sciences. Indeed, mathematics finds its way into, for example, finance, economics, engineering, computer science, and music. "Engineering students at Baylor automatically earn a minor in mathematics because they need 21 hours of mathematics credit for their degree", says Littlejohn. "If these students can complete an additional 12 hours of upper division mathematics or statistics, they will earn a secondary major in mathematics. I have talked to several students in the past few weeks who have indicated that they plan to pursue our secondary major."

For more information on this important curriculum change, visit the link at the mathematics department web site <http://www.baylor.edu/math/news.php?action=story&story=106491>.

Profiles of Current Mathematics Graduate Students

Charles Nelms: I can honestly say that when I was in junior high and high school I never imagined myself doing anything with math. It was probably my least favorite subject throughout high school. I grew up on a farm in Chandler, a typical small town in Oklahoma. I would have been lucky to have taken Algebra 2 there, most of the time there were not enough students interested in it for the class to be offered. At the time that would have been just fine with me, but I enjoyed every other aspect of school especially the sciences so when an opportunity arose for me to attend a different high school with much more advanced classes in all areas of math and science I took it. At my new school I was not only able, but required to take math through vector calculus (Cal 3 here at Baylor). This must have seemed like a good idea to the administration there, but I definitely did not like it. Have I mentioned that I really did not like math all that much then?

After high school, I gave college a shot, but my heart wasn't in it at the time. So I switched gears and went to work at a steel fabrication company for the next 13 years. I loved my job; I learned how to weld structural steel, read architectural and structural drawings, and even designed some of them myself. But after that many years there was not much left for me to learn there, and if there has been one constant for me it is a desire to always be learning. That is when I decided to head back to college. Now when I mentioned this to my superiors where I was working, they were extremely excited. They were hoping I would get an MBA, or engineering degree. I was going to disappoint them because I chose mathematics. Why in the world would someone who admittedly had very little affection for mathematics choose that as a major when going back to college? Well, business was out as a choice because I was leaving the business world, and having worked alongside engineers for 13 years, I realized that after a certain point they never really had to learn anything new either. So that left me with some kind of research science, to



Charles Nelms

me that meant Physics, Chemistry, or Mathematics. I hated writing lab reports, so math was the choice. And I have not regretted it, and to my and all my former math teachers' astonishment I love it now.

I completed my undergraduate degree from the University of Central Oklahoma, and I applied to Baylor due to the encouragement of a recent graduate, Dr. Britney Hopkins. I was not sure about attending a graduate school until my visit here, when all of the things she had told me about the faculty and other students turned out to be true. Everyone here is supportive and friendly and they care about how you are doing not just in classes but with other parts of your life as well. I am in my second year here at Baylor, the classes have been a challenge but with the help of my classmates and professors I am making it through, and having a great time doing it.

I still have so much to learn, and I am looking forward to doing that here at Baylor. I plan to work on my thesis with Dr. Ronald Stanke in representation theory. It is an area which I do not know nearly enough about yet but it will be fun getting that knowledge. When I graduate from Baylor I hope to become a teacher.

James Kelly: Throughout my life, one thing that has consistently given me trouble is that I have too many interests. In school, I always did well in every subject (except in handwriting), and I have considered quite a variety of professions ranging from musician to politician, but usually my enthusiasm for each idea would be relatively short-lived. The only subject that ever particularly stood out was mathematics. One thing that always drew me to math was that most other subjects were simply a lot of memorization. I could do it and, from time to time, I would find the subjects interesting, but with math it wasn't about memorization it was about understanding. If you could understand how things worked, you could solve any problem. That being said though, I never could get very excited about any careers I could think of



James Kelly

involving math. When I went to college, I decided to major in math with teacher certification planning to be a high school math teacher. It seemed like it would be a good job; the idea of teaching at a college level was much more appealing to me, but I could not imagine going to graduate school. As well as I did in school, I never liked it, so the thought of spending more years in school than I had to seemed ridiculous. I maintained this apathetic attitude toward school and toward my career plans for my first two and a half years in college. Then, one semester, I took Topology and Abstract Algebra. All of a sudden, I had an entirely new appreciation for math. I loved the logic and the abstract thinking. Proving a theorem was like solving a fascinating puzzle. School (well at least my math classes) began to actually be fun. I enjoyed doing my homework, and before every test, I would spend hours helping my classmates understand the material, and I loved it. Now all of a sudden, the idea of graduate school actually seemed fun.

Once I started at Baylor, my love of math only increased. Now, not only do I enjoy the math I am doing, but I better appreciate the classes I took in high school, like Algebra, Geometry, Precalculus and Calculus. Now that I understand more of the big picture of mathematics, I can see where the various pieces fit that I did not fully appreciate before. Because of this, I am excited now when I get a chance to teach a class like Precalculus and get to pass along even a little of my passion for math. While I still occasionally get sidetracked and wonder if I could have been a professional musician, I know I am in the right place, and I am excited to continue learning.

Reeve Hunter: I ended up doing my undergraduate studies here at Baylor University when my parents moved to Waco, TX, and I came with them following my freshman year of college at the University of Georgia. When thinking about possible careers after college, I often felt that being a teacher might be a good fit for me. With that in mind, I studied English Literature. Along the path to graduation, I took an intro physics course to fill an elective credit and was a bit surprised to find myself really enjoying the problems we were given to solve. I had to face the shocking reality: I liked mathematics. So I signed myself up for a mathematics minor.



Reeve Hunter

After graduating from Baylor University, I spent two or three years reading a lot, traveling, and playing music here in Waco and around the country. For various reasons, my plans for teaching English did not come to fruition. After moving to Chattanooga, TN, and getting married, I decided if I was going to make a career in education work, I needed to have some tangible goals. I considered a graduate degree in both English and Math. After deliberating for some time, I decided that my penchant for problem solving would serve me well in math education. I started taking math courses at the local University to meet the requirements for applying to graduate programs.

When I received an offer to study here at Baylor University, my wife and I decided to accept. This is my first year in the graduate program, and so far I have enjoyed being back at Baylor. I have some great professors, and everyone in the department is quite friendly. At this point I am still not sure what I would like to focus on in the future, but for now I am having a good time exploring the area of topology. My wife loves making fun of me for using words like “clopen” and “Hausdorff”.

In the meantime, I am excited to be establishing a solid foundation in math that I believe will be crucial in my future success as a math teacher or professor. I’m looking forward to next fall when I will have the opportunity to teach an undergraduate course in mathematics! Yes, I’m nervous about teaching, but I’m ready to give it my best and see what happens. This whole journey has been quite unpredictable and at times considerably demanding, but I am glad to be here, and I’m interested to see where the path I have chosen leads.

Profiles of Some Top Undergraduate Mathematics Students

Emily Peirce is a freshman mathematics major from Bryan, Texas having started at Baylor in the fall of 2011. Well, actually, she already has accumulated 46 hours of credit (and carries a 4.0 GPA) due to Advanced Placement courses in high school so, technically, she is considered a sophomore already at Baylor. Her parents, Chuck and Diana Peirce, were both biology majors at Baylor and Emily’s brother, Andrew, is currently a biology major at Baylor. So why not biology for Emily at Baylor? “I love mathematics” is Emily’s simple, emphatic, and immediate response! Mathematics has always come fairly naturally to Emily and she is quick to credit her parents’ support as well as several excellent mathematics teachers that she had in high school.

Emily’s first mathematics course at Baylor was Calculus III last fall; her teacher was Dr. Jon Harrison and she credits Dr. Harrison for starting her study in mathematics on the right footing. “He was great and I learned a lot from Dr. Harrison”. Currently, Emily is taking linear algebra from Dr. Ray Cannon and number theory from Dr. Ed Burger. She is enjoying both of these classes and the opportunity to learn from these gifted teachers. The number theory course that she is taking from Professor Burger is actually a junior/senior level course so she is being challenged far more than the average freshman would be in a

mathematics class. But she is enjoying the course and getting a head start on abstract concepts. Dr.



Emily Peirce

Burger says “Emily is energetic, talented, and hardworking. Even though she's the only first-year student in the class, you'd never know it by watching her class presentations. Right now she's preparing a talk she will deliver this spring at the Mathematical Association of America Texas Section Conference in Dallas. She decided she wanted to speak on how mathematics reveals some secrets to certain magic illusions.”

In Emily's spare time, she enjoys playing the piano, singing, and sewing. And since her Dad is originally from Massachusetts, she is also a die-hard Red Sox baseball fan (Dr. Cannon, a life-long Yankees fan, will try his best to ‘teach’ Emily the correct baseball team to support!).

Since Emily is technically a freshman, it is difficult to say what vocation her mathematics degree will lead her to at this point. She can definitely ‘see’ herself going to graduate school in mathematics. For certain, no matter what Emily decides to do, she will certainly succeed!

Kevin Ruggeberg is a senior mathematics major, with a 4.0 GPA, who was recently honored, along with fellow seniors Evan Bauer and Austin Christenberry, as the top students in mathematics for the annual Academic Honor's Convocation ceremony in April. Kevin is the son of Brian and Lynn Ruggeberg of Arlington, Texas.



Kevin Ruggeberg

Kevin, who also minors in both German and Economics, chose Baylor University because of its size or, more exactly, its *smaller* size compared to the typical state universities. Yet Kevin enjoys the breadth of classes that he has taken and he especially appreciates the teachers that he has at Baylor. Favorite teachers at Baylor so far? Kevin answers “That's a really hard question - I've had so many good teachers; actually, they have all been good! But if I had to name a few, I really enjoyed taking classes with Jon Harrison, Paul Hagelstein, David Ryden, Ed Burger, in the math department, and Rita Abercrombie, who teaches German. Each of them has had a huge impact in my education so far at Baylor. They really care and are always willing and able to help any time of the day.” Kevin is taking

number theory from Dr. Burger who remarks that “Kevin is an outstanding student. His mathematical arguments are clever and creative and his presentations are on par with those given by some Ph.D. mathematicians. I look forward to learning what tremendous future lies ahead for Kevin--I have great expectations.”

Favorite hobby? Kevin is quick to say that he enjoys reading. One of his favorite, and most influential books, is Douglas Hofstadter's Pulitzer Prize winning *Gödel, Escher, Bach: An Eternal Golden Braid*. “This books really changed my approach to doing proofs in mathematics”, says Kevin. Right now, Kevin is reading Mark Danielewski's recent, critically acclaimed, novel *House of Leaves*.

What's in Kevin's future? He remains open-minded about graduate school in mathematics. He is also contemplating a career in actuarial science and will soon interview for a summer internship with an insurance company in Richardson, Texas. This vocation requires a strong background in mathematics, statistics, and economics -- three subjects that Kevin just happens to excel in!

Math Movie Makers Dano Johnson, Seth Caplan Return to Baylor in April

Dano Johnson and Seth Caplan, co-creators of the hit movie "Flatland: the Movie" together with Jeffrey Travis, will visit Baylor University on April 18 as part of National Mathematics Awareness Month....and a great head start to Diadeloso Day on April 19!



Dano Johnson, Jeffrey Travis, and Seth Caplan

Professor Edward B. Burger, visiting Vice Provost for Strategic Educational Initiatives and the 2010 Robert Foster Cherry Award winner for Great Teaching at Baylor, will introduce Dano and Seth at 6 pm in the Kayser Auditorium of the Hankamer School of Business. A re-showing of "Flatland: The Movie" will immediately follow. This animated version of Edwin Abbott's 1884 classic, *Flatland: A Romance of Many Dimensions*, stars Martin Sheen, Kristen Bell, Michael York, Tony Hale, and Joe Estevez. The movie was produced by Seth; Dano co-directed the film with Jeffrey Travis and also animated the film. The story revolves around two-dimensional characters, Arthur Square and his curious granddaughter, Hex. They soon discover that there is much more to their planar life - namely three-dimensional Spaceland and beyond - and this discovery leads them into serious trouble with the evil rulers of their two-dimensional world. The story is about the quest for truth and, even after more than 125 years, it remains a timeless satire.

After the movie presentation, Dano and Seth will then discuss and show clips from their newest movie, "Sphereland", the much anticipated sequel to Flatland, which is scheduled to be released in the summer of 2012. "Sphereland" is based on the 1965 book by Dutch author, Dionys Burger, and is a sequel to Abbott's Flatland.

Everyone is invited to this special evening.....bring some friends, enjoy the movie, and stick around afterwards to meet Dano and Seth!

Department Welcomes Distinguished Visitors to Speak in Departmental Lecture Series

Besides having a regular colloquium series throughout the year involving visiting mathematicians from around the world, the Department of Mathematics runs three prestigious lecture series that are funded through the Office of the Dean in the College of Arts and Sciences. These lecture series are *The Baylor Lecture Series in Mathematics*, *The Baylor Undergraduate Lecture Series in Mathematics*, and the *Life Experiences in Mathematics Series*. The 2011-2012 academic year features several outstanding

mathematicians lecturing in these series. All talks are open to the public; we would especially love to see our alumni at these lectures!

Ray Perryman to speak in 2011- 2012 Life Experiences in Mathematics Series

Dr. Ray Perryman (Baylor '74, Mathematics) will be the third speaker in the Life Experiences in Mathematics lecture series when he visits Baylor University on March 21. The title of his lecture, to be delivered in the Hankamer School of Business is "*Madmen and the Village Watchman - Mathematics in the Trenches of Economics and Public Policy*". For further information, please visit the [Life Experiences in Mathematics](#) web page.

Besides holding a BS degree in Mathematics from Baylor, Dr. Perryman earned a Ph.D. in Economics from Rice University. Dr. Perryman has held numerous academic positions in his career including ten years as Herman Brown Professor of Economics and five years as University Professor and Economist-in-Residence at Baylor University, as well as five years as Business Economist-in-Residence at Southern Methodist University.



Ray Perryman

Dr. Perryman is Founder and President of The Perryman Group (TPG), an economic and financial analysis firm headquartered in Waco, Texas. He is widely regarded as one of the world's most influential and innovative economists. His complex modeling systems form a basis for corporate and governmental planning around the globe. His thousands of academic and trade articles and presentations span a wide variety of topics, gaining him international respect and acclaim. He has also authored several books, including *Survive & Conquer*, an account of the Texas economy during the turbulent 1980's, and *The Measurement of Monetary Policy*, a treatise on Federal Reserve activity. A popular speaker, he addresses hundreds of audiences throughout the world every year.

Among Dr. Perryman's numerous awards are (1) the Nation's Outstanding Young Economist and Social Scientist, (2) the Outstanding Young Person in the World in the Field of Economics and Business, (3) one of the Ten Outstanding Young Persons in the World, and (4) the Outstanding Texas Leader of 1990. During his nearly 30 years of experience, he has been presented citations for his efforts from both the Congress of the United States and the Texas Legislature. He has been honored by (1) The Democracy Foundation for his role in promoting capitalism in mainland China, (2) the Asia and World Institute for his efforts to encourage international academic exchange, and (3) the Systems Research Foundation for his contributions to the field of economic modeling. He is a Fellow of the International Institute for Advanced Studies and has received the Institute's prestigious Lifetime Achievement Award.

Dr. Perryman authors *The Perryman Economic Forecast*, a subscription service detailing projections of state and metro area business activity, and *The Perryman Report & Texas Letter*, a succinct newsletter providing vital information about various aspects of the Texas economy. Dr. Perryman also writes a weekly syndicated column, *The Economist*, and hosts a daily syndicated radio commentary on economic affairs, "The Perryman Report." In former positions as a research chair-holder, University Professor, and Economist-in-Residence at Baylor University and Business Economist-in-Residence at Southern Methodist University, Dr. Perryman pioneered the use of timely and reliable economic information for a spectrum of strategic purposes. His studies have played a role in the creation and retention of hundreds of thousands of jobs.

Cited by major media as "a world-class scholar" and "the most quoted man in Texas," Ray Perryman is an active participant in state, national, and world economic scenes. He has been a member of dozens of state, federal, and international task forces, served as editor of both academic and trade journals, and led conferences within the fields of economics, statistics, forecasting, modeling, and simulation. A member of several corporate boards and advisor to numerous governmental leaders, Dr. Perryman has been honored by the Texas Legislature for his "tireless efforts in helping to build a better Texas."

Ronald Graham to speak in 2011- 2012 Baylor Lecture Series in Mathematics

Professor Ronald Graham will be the fifth speaker in the Baylor Lecture Series in Mathematics when he visits Baylor from April 11-13. His public lecture "*Computers and Mathematics: Problems and Prospects*" will take place on April 12 and his departmental lecture "*The Combinatorics of Solving Linear Equations*" will be given on April 13. More information on these lectures can be found by visiting the [Baylor Lecture Series in Mathematics](#) web page.

Professor Graham is the Irwin and Joan Jacobs Professor in Computer Science and Engineering at the University of California, San Diego and the Chief Scientist at the California Institute for Telecommunications and Information Technology. He is a mathematician credited by the American Mathematical Society as being "*one of the principal architects of the rapid development worldwide of discrete mathematics in recent years*". For his important and fundamental contributions to mathematics and computer science, in particular to graph theory, combinatorial number theory, scheduling theory, Ramsey theory, and approximation algorithms, Ron was elected a member of the National Academy of Sciences in 1985.



Ron Graham

At the age of 15, Ron started his university studies at the University of Chicago. He received his Ph.D. in mathematics from the University of California, Berkeley in 1962. For the next 37 years, Dr. Graham worked at AT&T Bell Laboratories in New Jersey working on several problems in pure and applied mathematics. His work at Bell Labs gave rise to worst-case analysis theory in scheduling, and helped lay the groundwork for the now-popular field of computational geometry. It also ignited interest in an obscure branch of discrete mathematics called Ramsey theory, which deals with the underlying order in apparently disordered situations. For his contributions to these fields, the American Mathematical Society awarded Graham the Steele Prize for Lifetime Achievement in 2003. In 1999, Ron returned home to California when he accepted a position at UC-San Diego.

An important 1977 paper by Dr. Graham considered a problem in Ramsey theory, and gave a "large number" as an upper bound for its solution. This number has since become well known as the largest number ever used in a mathematical proof (and is listed as such in the Guinness Book of Records), and is now known as *Graham's number*.

Graham popularized the concept of the Erdős number, named after the highly prolific Hungarian mathematician Paul Erdős (1913–1996). He co-authored almost 30 papers with Erdős, and was also a good friend. Professor Graham has published more than 320 papers and five books, including *Concrete Mathematics* with Donald Knuth and Oren Patashnik.

Between 1993 and 1994 Graham served as President of the American Mathematical Society. He also served as President of the Mathematical Association of America in 2003-2004. Graham was featured in Ripley's Believe It or Not for being not only "one of the world's foremost mathematicians", but also "a highly skilled trampolinist and juggler", and past president of the International Jugglers' Association.

In 2003, Graham won the American Mathematical Society's annual Steele Prize for Lifetime Achievement. In 1999 he was inducted as a Fellow of the Association for Computing Machinery. Graham was also one of the laureates of the prestigious Pólya Prize the first year it was awarded, and among the first to win the Euler Medal. The Mathematical Association of America has also awarded him both the Lester R. Ford prize and the Carl Allendoerfer prize in 1976.

April Mathematics Events

April is.....



National Math Awareness Month is held each year in April throughout the United States. Its goal is to increase public understanding and appreciation of mathematics.

National Mathematics Awareness Month began in 1986 as Mathematics Awareness Week with a proclamation by President Ronald Reagan, who said in part:

"Despite the increasing importance of mathematics to the progress of our economy and society, enrollment in mathematics programs has been declining at all levels of the American educational system. Yet the application of mathematics is indispensable in such diverse fields as medicine, computer sciences, space exploration, the skilled trades, business, defense, and government. To help encourage the study and utilization of mathematics, it is appropriate that all Americans be reminded of the importance of this basic branch of science to our daily lives."

Here is a list of our April mathematics events at Baylor; for further information, please see our departmental webpage [Baylor Department of Mathematics Web Page](#).

Date	Event	Speaker	Place
April 10 3:30pm	Special Undergraduate Colloquium Lecture <i>"The Irrational Side of Mathematics"</i>	Dr. Robert Tubbs, Professor, University of Colorado	SR 344
April 12 4:00pm	<u>Baylor Lecture Series</u> <u>in Mathematics</u> <i>"Computers and Mathematics: Problems and Prospects"</i>	Dr. Ronald Graham, Professor, University of California San Diego	D109 BSB
April 13 3:30pm	<u>Baylor Lecture Series</u> <u>in Mathematics</u> <i>"The Combinatorics of Solving Linear Equations"</i>	Dr. Ronald Graham, Professor, University of California San Diego	SR 344
April 18 6:00pm	Pre-Diadeloso Mathematics Movie Event <i>"Flatland: the Movie"</i>	Dano Johnson & Seth Caplan Director, Animator, and Producer	Kayser Auditorium (Hankamer School of Business)
April 25 7:30pm	Special Baylor Event <i>"All in the Family: Creativity Across the Disciplines Through Three Brothers"</i>	Dr. Ted Chihara (Purdue mathematician), Dr. Charles Chihara (Berkeley philosopher), Dr. Paul Chihara (UCLA musician) A Dialogue with by Dr. Kevin Dougherty	Kayser Auditorium (Hankamer School of Business)
April 26 3:30pm	Joint Mathematics/Philosophy Lecture <i>"In the Wake of the Frege-Hilbert Dispute"</i>	Dr. Charles Chihara Professor Emeritus Department of Philosophy University of California Berkeley	SR 344

Upcoming Baylor Lecturers

Keith Devlin, National Public Radio's "Math Guy", will be the fifth speaker in the Baylor Undergraduate Lecture Series in Mathematics when he visits Baylor University from October 2-5, 2012.



Keith Devlin

Devlin earned his bachelor's degree in mathematics from King's College London and his Ph.D. degree in mathematics from the University of Bristol. He is a consulting Professor of Mathematics at Stanford University, co-founder and Executive Director of Stanford's Human-Sciences and Technologies Advanced Research Institute, co-founder of Stanford's Media X university-industry research partnership program, and a Senior Researcher in Stanford's Center for the Study of Language and Information.

He is the author of 31 books and more than 80 research articles. He is recipient of the Pythagoras Prize, the Peano Prize, the Carl Sagan Award, and the Joint Policy Board for Mathematics Communications Award. In 2003, he was recognized by the California State Assembly for his "innovative work and longtime service in the field of mathematics and its relation to logic and linguistics." His latest research

work has focused on the development of new tools and protocols to assist intelligence analysis and the development and use of videogames in mathematics education. Devlin is actively engaged in promoting the public understanding of mathematics and its role in modern society, topics on which he lectures extensively around the world.

Information on his two lectures can be found by going to the department's web site, specifically to the link <http://www.baylor.edu/math/news.php?action=story&story=106641>.



Gil Strang

Gilbert Strang, MathWorks Professor of Mathematics at the Massachusetts Institute of Technology, will be the sixth speaker in the Baylor Lecture Series in Mathematics. Details of his visit, including specific dates and titles of his two lectures, will be made available soon.

Professor Strang returned to his alma mater MIT upon completing his Ph.D. degree from UCLA in 1959 under the direction of Peter Henrici. He received the S.B. from MIT in 1955, and the B.A. and M.A. as a Rhodes Scholar from Oxford University in 1957. He joined the MIT mathematics faculty in 1962, and was promoted to Professor in 1970.

His research focuses on mathematical analysis, linear algebra, and PDEs. He has written textbooks on linear algebra, computational science, finite elements, wavelets, GPS, and calculus. His video lectures are on MIT's OpenCourseWare, and he is on the editorial board of numerous journals, and is the founder of Wellesley-Cambridge Press. His service to the academic community is extensive. Professor Strang served as President of SIAM, 1999-2000, Chair of the Joint Policy Board for Mathematics, 1999, Chair of the U.S. National Committee on Mathematics, 2002, and member of the Abel Prize Committee, 2003-2005. In the Mathematics Department, he was Chair of the Pure Mathematics Committee, 1975-1979.

Professor Strang has received distinctions for his research, service and teaching; among them: the Chauvenet Prize (1976), the SIAM Award for Distinguished Service (2003), the MIT Graduate School Teaching Award (2003), the Von Neumann Prize Medal of the U.S. Association for Computational Mechanics (2005), the MAA Lester R. Ford Prize (2005), the MAA Franklin and Deborah Tepper Haimo Prize (2006), and the Henrici and Su Buchin Prizes of the International Congress of Industrial & Applied

Mathematics (2007). Professor Strang is a Member of the National Academy of Sciences and a Fellow of the American Academy of Arts & Sciences. He is an Honorary Fellow of Balliol College, Oxford.

Mike Hosea will deliver the fourth annual Life Experiences in Mathematics lecture during the 2012-2013 academic year. Specific dates for his Baylor visit will be determined in the coming weeks.



Mike Hosea

Mike is a numerical specialist with The MathWorks, the company that produces, among other important products, the software packages Matlab and Simulink. Mike graduated with his BS and MS degrees in mathematics from Baylor in, respectively, 1986 and 1988. In 1993, He earned his Ph.D. in numerical analysis from Southern Methodist University under the supervision of well-known numerical analyst Larry Shampine. Mike also earned another MS degree in Operations Research from SMU in 2004.

Prior to his present position at The MathWorks, where he has been since 2004, Mike had considerable experience in both academic and business positions. He was an actuarial assistant at Lewis & Ellis, Inc. From 1988-1992, Mike worked at Texas Instruments developing scheduling algorithms for semiconductor wafer fabs. He was an Assistant Professor of Mathematics at Northern Illinois University from 1993-1996 before returning to Texas Instruments from 1996-2004 as a Software Development Engineer, working on TI calculators and educational software. Mike was awarded two US Patents in connection with this work. He and his wife live in Natick, Massachusetts with their three children.

Food for Thought: 25 Mathematical Quotations

1. *How dare we speak of the laws of chance? Is not chance the antithesis of all law?* (Joseph Bertran, 1822-1900)
2. *My theory stands as firm as a rock; every arrow directed against it will quickly return to the archer. How do I know this? Because I have studied it from all sides for many years; because I have examined all objections which have ever been made against the infinite numbers; and above all because I have followed its roots, so to speak, to the first infallible cause of all created things.* (Georg Cantor, 1845-1918)
3. *Cogito Ergo Sum (I think, therefore I am).* (René Descartes, 1596-1650)
4. *It is nothing short of a miracle that modern methods of instruction have not yet entirely strangled the holy curiosity of inquiry.* (Albert Einstein, 1879-1955)
5. *God may not play dice with the universe, but something strange is going on with the prime numbers.* (Paul Erdős, 1913-1996)
6. *What I give form to in daylight is only one per cent of what I have seen in darkness.* (M.C. Escher, 1898-1972)
7. *Mathematicians have tried in vain to this day to discover some order in the sequence of prime numbers, and we have reason to believe that it is a mystery into which the human mind will never penetrate.* (Leonhard Euler, 1707-1783)
8. *To those who do not know mathematics it is difficult to get across a real feeling as to the beauty, the deepest beauty, of nature ... If you want to learn about nature, to appreciate nature, it is necessary to understand the language that she speaks in.* (Richard Feynman, 1918-1988)
9. *In questions of science, the authority of a thousand is not worth the humble reasoning of a single individual.* (Galileo Galilei, 1564-1642)
10. *The total number of Dirichlet's publications is not large: jewels are not weighed on a grocery scale.* (C.F. Gauss, 1777-1855)

11. *To parents who despair because their children are unable to master the first problems in arithmetic I can dedicate my examples. For, in arithmetic, until the seventh grade I was last or nearly last.* (Jacques Hadamard, 1865-1963)
12. *To be a scholar of mathematics you must be born with talent, insight, concentration, taste, luck, drive and the ability to visualize and guess.* (Paul Halmos, 1916-2006)
13. *Reductio ad absurdum, which Euclid loved so much, is one of a mathematician's finest weapons. It is a far finer gambit than any chess play: a chess player may offer the sacrifice of a pawn or even a piece, but a mathematician offers the game.* (G.H. Hardy, 1877-1947)
14. *If I were to awaken after having slept for a thousand years, my first question would be: Has the Riemann hypothesis been proven?* (David Hilbert, 1862-1943)
15. *God ever arithmetizes.* (Carl Jacobi, 1804-1851)
16. *I read in the proof sheets of Hardy on Ramanujan: "As someone said, each of the positive integers was one of his personal friends." My reaction was, "I wonder who said that; I wish I had." In the next proof-sheets I read (what now stands), "It was Littlewood who said..."* (J.E. Littlewood, 1885-1977)
17. *What we know is not much. What we do not know is immense.* (Allegedly the last words of Pierre-Simon Laplace, 1749-1827)
18. *He who understands Archimedes and Apollonius will admire less the achievements of the foremost men of later times.* (Gottfried Leibniz, 1646-1716)
19. *The supreme misfortune is when theory outstrips performance.* (Leonardo da Vinci, 1452-1519)
20. *If I have been able to see further, it was only because I stood on the shoulders of giants.* (Isaac Newton, 1643-1727)
21. *In the absence of any other proof, the thumb alone would convince me of God's existence.* (Isaac Newton, 1643-1727)
22. *[On quantum mechanics] I don't like it, and I'm sorry I ever had anything to do with it.* (Erwin Schrödinger, 1887-1961)
23. *By and large it is uniformly true that in mathematics there is a time lapse between a mathematical discovery and the moment it becomes useful; and that this lapse can be anything from 30 to 100 years, in some cases even more; and that the whole system seems to function without any direction, without any reference to usefulness, and without any desire to do things which are useful.* (John von Neumann, 1903-1957)
24. *My work has always tried to unite the true with the beautiful and when I had to choose one or the other, I usually chose the beautiful.* (Hermann Weyl, 1885-1955)
25. *First rate mathematicians choose first rate people, but second rate mathematicians choose third rate people.* (André Weil, 1906-1998)

Alumni News

Martha Anderson Cranor (BA Mathematics, 1973) recently added another award to her distinguished teaching career at Fossil Ridge High School in Fort Collins, Colorado. Previously, Martha won a Colorado Council of Teachers of Mathematics Teaching Award and was named a 'national math hero' by the Raytheon Corporation. In 2011, she was named a Siemens STEM Institute Fellow. Fifty educators from throughout the United States were selected for this prestigious honor from the Siemens Foundation. She had an all expenses-paid, week-long professional development experience in Washington, D.C., where she met leading scientists, thought-leaders, personalities, and innovators working to promote STEM (Science, Technology, Engineering, Mathematics) disciplines in the United States. Congratulations, Martha!

Faculty News

Paul Hagelstein received a \$35000 grant from the Simons Foundation for research in harmonic analysis. He also gave lectures at the University of Colima, Mexico as well as at the AMS Regional Meeting in

Lawrence, Kansas. Paul also received an Undergraduate Research and Scholarly Activities grant to work with undergraduate student Trent Osborn this summer.

Jonatan Lenells gave talks in 2011 at the Institute for Advanced Study (Princeton), the University of Pittsburgh, the Erwin Schrödinger Institute (Vienna, Austria), the University of Washington, Baylor University, and the American Mathematical Society's national meeting in New Orleans.

Lance Littlejohn will travel to Germany this summer to work with colleagues at the Universities of Trier and Aachen. He is also co-organizing a conference on special functions in Patras, Greece in September.

Tim Sheng continues as Editor-in-Chief for the *International Journal of Computer Mathematics* by Taylor & Francis. Tim's research has entered its 7th consecutive year of being supported by the U.S. Air Force Research Laboratory. He also organized a research workshop in computational mathematics at Baylor in September 2011. In addition to giving 11 research talks in Hong Kong, Macau, China, Taiwan, and the United States, he delivered a sequence of 8 invited lectures on Teaching Calculus in an Interactive and Animated Way, at Southeast University (China) in 2011. He is a recent recipient of a Baylor URC award.

David M. Arnold, the Ralph and Jean Storm Professor of Mathematics, gave an invited lecture at the Conference on Groups and Model Theory, Muelheim, Germany, and a series of invited lectures to the Algebra Seminar, University of Hawaii.

Guglielmo Fucci gave invited lectures this past year at Texas A&M University, at the 2011 Quantum Vacuum Workshop at the University of Oklahoma, and at the 2011 international meeting Quantum Field Theory in External Conditions Conference in Benasque, Spain.

Johnny Henderson was a guest editor for a special issue of the Rocky Mountain Journal of Mathematics in 2011 dedicated to the memory of his supervisor, Dr. Lloyd K. Jackson. Johnny also gave invited lectures at the national meeting of the American Mathematical Society in New Orleans, at the University of Tennessee, and at the University of North Alabama.

Jon Harrison is currently on research leave for the spring and summer semesters working with colleagues at the University of Bristol in England. In the past year he gave invited lectures at Royal Holloway, University of London U.K., Bristol University, U.K. and Texas A&M and spoke at the 2011 international meeting Quantum Field Theory in External Conditions in Benasque, Spain.

Brian Raines gave an invited talk at the Spring Topology and Dynamics Conference which was held in Tyler, Texas. He hosted two research visitors, one from the University of Bristol and the other from the University of Birmingham, both in England. Brian was also named a Baylor Fellow in recognition of innovative teaching.

Matthew Beauregard, in his second year as a post doc in the Department, kept himself busy earning honors for his teaching and research. Most notably, he was awarded the Mortor Board Circle of Achievement Award for Teaching Excellence. He also presented papers at the annual Joint Mathematics Meetings in Boston and at the 45th Southeastern Symposium on System Theory sponsored by IEEE. In addition, with 3 other faculty members in the mathematics and engineering departments he helped form a student-based apologetics group exploring issues of faith and science.

Klaus Kirsten has a four year \$150,000 grant from the National Science Foundation. His proposal is entitled "The Casimir Effect: Geometry and Boundary Condition Dependence". In 2011, Klaus gave invited lectures at the University of Iowa, Oklahoma University, the University of Texas at Austin, Baylor University and in Benasque (Spain).

Math News Briefs

- Gail Illich finished third in the Woodlands Marathon on March 3. Gail's time was an excellent 3:03:05. Earlier in the year, Gail won the Miracle Match Marathon – aka “the toughest little marathon in Texas”. Congratulations, Gail!
- Baylor mathematics majors Evan Bauer, Austin Christenberry, and Kevin Ruggeberg have been named Academic Honors Convocations scholars for the academic year 2011-2012. They will be honored on April 21 at the annual Honors Convocation ceremony at the Bill Daniels Student Center. Congratulations Evan, Austin, and Kevin – we are very proud of your achievements!
- Baylor Admissions created a promotional video for our department to use in attracting mathematics majors. This video “stars” current mathematics majors Dana Bomgaars and Adam Teletovich. Check out the super job that they did for us by going to the YouTube [Baylor Math Major Video](#) link.
- Jose Franco, who will graduate in May 2012 with his Ph.D. under the supervision of Dr. Mark Sepanski, has accepted a position as Assistant Professor in the Department of Mathematics and Statistics at the University of North Florida in Jacksonville. We wish Jose and his wife, Sarah, all the best as they embark on a new chapter in their lives!

Keep in Touch!

We want to hear what you are up to and the role that your experience with the Department of Mathematics has played in your ongoing journey. We invite and encourage you to remain active in the life of our department. There are a variety of ways for alumni and friends to be involved.

- Please stay in touch. Our current students welcome information about internships and other opportunities, and students greatly appreciate presentations by alumni and others who talk about their careers and share their insights into the employment landscape. If you are interested in giving a talk to our majors, please contact Lance_Littlejohn@baylor.edu.
- Each of the chairs within the College of Arts and Sciences administers a discretionary fund that directly supports his or her department. If you are interested in contributing to these funds, please contact Lance Littlejohn at Lance_Littlejohn@baylor.edu. Alternatively, you can contact Frank Shannon at Frank_Shannon@baylor.edu or Rose Youngblood at Rose_Youngblood@baylor.edu in university development.
- As we pursue our goal of becoming one of the nation's top mathematics programs, endowed chairs, lectureships, visiting professorships, and scholarships will play a very important role. If you are interested in supporting the department through an endowed fund or scholarship, please contact Frank Shannon at Frank_Shannon@baylor.edu or Rose Youngblood at Rose_Youngblood@baylor.edu in university development.

Let us know what you are doing and please share your stories with us. We would like to include lots of items for our **Alumni News** section – so please send me (Lance_Littlejohn@baylor.edu) all of your ‘alumni newsworthy’ snippets! And, of course, if you are in the area, you are always welcome to come by and see us! We always enjoy talking with old friends and former students!