

# The Archimedean

Syracuse University  
Mathematics Department  
Newsletter Spring 2014

## A Word from the Chair

*Eugene Poletsky*

The year 2013 was probably the most turbulent year in departmental history. The growth in enrollment finally hit the roof. The total number of students in our classrooms is now more than 8,000, a 3% increase over last year, but the increase in enrollment in upper-level undergraduate courses was a whopping 12%. Last year 1,060 students took such courses. The enrollment in graduate courses stayed at the same level.



The increase in enrollment in the upper-level courses forced us to open new sections and, consequently, increase the size of sections taught by teaching assistants. Fortunately, we were able to hire another adjunct professor, Suanne Au, who helped to alleviate the problem. Now we have 31 tenure or tenure-track faculty, 9 adjuncts, 4 postdocs and 51 teaching assistants to teach.

Like at many other universities, our department has also decided to move into the virtual realm of online courses. We are developing a program for a Certificate of Advanced Studies in

*See CHAIR on page 3*

## Carnegie Reading Room Complete

Nearly two years after it began, the ongoing renovation of Carnegie Library has reached a major milestone. The iconic Reading Room is, as of January 2014, once again open to the public.

The Reading Room has had a complete facelift. A new parquet floor has been installed, the scagliola columns have been cleaned and restored, and the old desks and chairs have been refurbished, with new task lighting and data ports. The windows opening onto the Reading Room from the third-floor hallways have been replaced with glass railings, reopening the original arches on the ambulatory, and the three sets of original wooden doors that leading from the vestibule into the Reading Room have been refinished.

The renovation has touched nearly every aspect of the building. Most dramatically, the main entrance to the building is now once again through the front stairs and doors, which have reopened for the first time since the mid-1970s. The entry vestibule, which housed classrooms 220 and 222 for many years, now

*See CARNEGIE on page 5*

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# New Faces in 2013

**Margaret Doig** is a Philip T. Church Postdoctoral Fellow 2013–2015. She specializes in applications of Heegaard Floer homology to low-dimensional topology, especially some recent applications to knot surgery and classification of rational homology cobordisms.

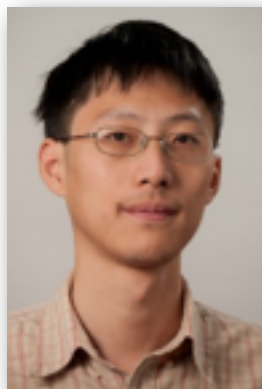
Margaret earned her PhD from Princeton in 2010 under Zoltán Szabó. She comes to SU after 3 years as a Zorn Postdoctoral Fellow at Indiana University, Bloomington. Margaret is married to Steve Maderak and enjoys flying airplanes. She works search and rescue/disaster relief in her spare time with the Civil Air Patrol, and was on one of the crews pulled in to fly photo reconnaissance missions and work mission base for FEMA after Hurricane Sandy.

**Yuan Yuan** joins the department as a tenure-track Assistant Professor. His research interests are in complex geometry and several complex variables. He has particular interests in the various rigidity phenomena in the complex structure and the geometric flows related to the canonical metrics on complex manifolds.

Yuan received his Ph.D from Rutgers University at New Brunswick in 2010 and spent the next three years as J. J. Sylvester assistant professor at Johns Hopkins University. He enjoys travel and basketball.



*Fire alarms don't interrupt Doig's MAT 397 lecture.*

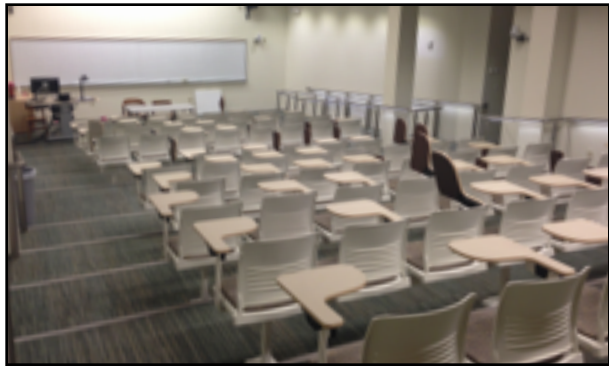
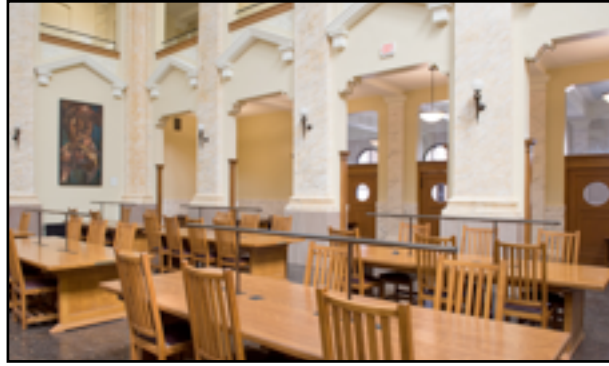


## New Grads in 2013–2014

- ▶ Laura Ballard (Houghton College)
- ▶ Taylor Borcyk (Ithaca College)
- ▶ Collin Bruce (Siena College)
- ▶ Sean Dana (SUNY Brockport)
- ▶ Emily Dougherty-Samowitz (Ithaca College)
- ▶ Raymond Garzia (SUNY Geneseo)
- ▶ Rachel Gettinger (Saint Vincent College)
- ▶ Zayd Ghoggali (University of Pittsburgh)
- ▶ Hubeyb Gurdogan (Bilkent University)
- ▶ Thomas Heath (SUNYs Geneseo/Cortland)
- ▶ Maureen Jeffery (Siena College)
- ▶ Cearra Jones (Delaware State University)
- ▶ Joshua Jones (University of South Carolina-Columbia)
- ▶ Clemens Kraus (Universität Ulm)
- ▶ Xuefei Ma (Dalian University)
- ▶ Sungju (SJ) Moon (Wake Forest University)
- ▶ Casey Necheles (Stony Brook University)
- ▶ John Mungai Njoroge (Egerton University, Kenya)
- ▶ Grace Njuguna (Kenyatta University, Kenya)
- ▶ AnnMarie O'Neil (Syracuse University)
- ▶ Stephen Parry (Elmira College and Missouri State University)
- ▶ Carl Ragsdale (University of Maine)
- ▶ James Robinson (SUNY Cortland)
- ▶ Chris Sanford (Western Carolina University)
- ▶ Stefan Schelling (Universität Ulm)
- ▶ Kofi Wagya (Indiana State University)

**Congratulations** to our recent postdocs who have moved on to new positions. **Jonas Bergman Ärleback** (postdoctoral fellow 2011-2013) has taken a position as a Universitetslektor at Linköping University in Sweden. **Thomas Jaeger** (P.T. Church postdoc 2011-2013) is an I-Center Postdoc at Kansas State University.

*Clockwise from top left: Reading Room, work tables, new auditorium 122 Carnegie, Diana the Huntress in the vestibule.*



*CHAIR from page 1*

Applied Statistics. The curriculum will consist of four courses and we plan to start it in the Fall of 2014. It is clear that higher education must take advantage of the new information technology and our faculty can make real contributions in online education.

While working hard on teaching, the department intends to increase its research power. This year Yuan Yuan, who got his PhD 3 years ago from Rutgers, was hired as a tenure-track Assistant Professor [see page 2]. The same year he won a 3-year NSF grant. All of our faculty hired in the last 15 years currently have or recently had a personal NSF grant. The department now has the highest percentage of faculty with external research support in the university. Recent cuts in federal funds sponsoring research activity brought some damage but nevertheless the department became much more research oriented. For example, last year Ted Cox was awarded a prestigious Simons Fellowship. This reward provides full support for a one semester sabbatical so a Fellow can devote it only to research.

Yuesheng Xu and Wu-Teh Hsiang retired in December [see page 5]. This is of course a loss of experienced and active faculty. But such things are

inevitable and we wish them a bright future.

Other shock waves are still running through Carnegie as its renovation continues. It looks that after several changes the final plan is in place. If all goes on schedule in the summer of 2015 the whole third floor will be occupied by faculty offices, while the first and second floors will contain classrooms, our main office and the Math Ed cluster. This will allow us to consolidate under one roof the entire faculty and adds several offices that we desperately need to host visitors and new faculty.

There has also been a certain amount of turbulence campus-wide as both Chancellor Nancy Cantor and Dean of Arts and Sciences George Langford recently announced they will be stepping down from their positions in the next few months. We are grateful to them both for their support of the department and wish them good luck and new achievements. We look forward to working with incoming Chancellor Kent Syverud, whose administration begins this month.

Throughout all these changes, we are proud of our alumni and friends, and grateful for all your support. Please keep in touch; we are always happy to hear of your successes and accomplishments. I wish you the best for 2014.



# Faculty Highlights 2013



**Uday Banerjee** gave a 10 hour invited lecture series, "Finite Element Methods and its Generalizations", in December 2013, at Sun Yat-Sen University, China.

**Dan Coman** was awarded a 3-year NSF grant "*Pluripotential Theory and Applications to Complex Geometry and Number Theory*".



**Ted Cox** was appointed a 2013 Simons Fellow by the Simons Foundation. This prestigious award supports extending a one-semester research leave into a full year's sabbatical. Only 40 awards were made in 2013 across all of mathematics.

**Helen Doerr** was a plenary speaker at the 16th International Conference on the Teaching of Mathematical Modelling and Applications, Blumenau, Brazil.

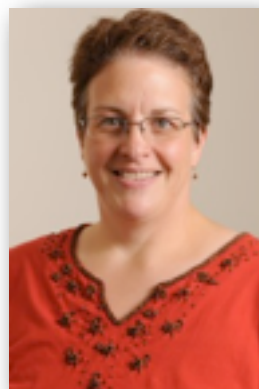


**Tadeusz Iwaniec** was awarded a 5-year NSF grant "*Sobolev mappings and energy-integrals in mathematical models of nonlinear elasticity*". He also accepted a one-year extension of his FiDiPro (Finland Distinguished Professorship) through 2014. Tadeusz gave plenary lectures at conferences in honor of Kari Astala, Frederick Gehring, and Carlo

Sbordone, as well as the VIGRE Lectures at Louisiana State University.

**Leonid Kovalev** was promoted to Full Professor and granted tenure in the Mathematics department.

**Graham Leuschke** gave a invited series of lectures on "Non-commutative desingularizations and maximal Cohen-Macaulay modules" at the MSRI workshop "Non-commutative algebraic geometry and representation theory".



**Joanna Masingila** has been named Interim Dean of the School of Education. She also currently serves as the Chair of the Department of Teaching and Leadership, and is a Laura J. and L. Douglas Meredith Professor for Teaching Excellence.



**Jani Onninen** was awarded a three-year NSF grant "*Variational Approach to Geometric Function Theory*" 2013-2016. Jani also spends this academic year on leave at the University of Jyväskylä, Finland.

**Yuan Yuan** (see page 2) won a three-year NSF grant "*Geometric function theory in several complex variables and complex geometry*" beginning in 2013.



**Dan Zacharia** was recognized by the College of Arts & Sciences as one of the Undergraduate Faculty Advisors of the year. He also spent two months during the fall semester as a Visiting Professor at Universität Bielefeld.

## CARNEGIE from page 1

showcases the bronze statue of Diana the Huntress that has returned from its temporary home on the second floor of Bird Library.

New classroom space has been created on the first floor, where the “pit” has been filled in and turned into two classrooms and a new 85-seat auditorium, which takes over from room 313 as the largest and best-equipped classroom in the building. Two more classrooms occupy the space under the front steps, and there



is space for a new Clinic Room, a new Arents Room, and another new classroom on the west side of the first floor. A new elevator and computer cluster also have been installed.

According to the Library, the Reading Room will be dedicated to silent, individual study, a return to its original purpose.

You can see more photos at various stages of the renovation, including Diana’s journey home, on the web at <http://library-blog.syr.edu/carnegie/>.

## Retirements

### Wu-Teh Hsiang

retired in December 2013, following his 32nd year in the department. Wu-Teh earned his Ph.D. at the University of Pennsylvania in 1977 under the supervision of Jerry Kazdan, with a thesis titled “Global Solutions and Equilibrium States of Quasilinear Parabolic Equations”. But his first mathematical publication (as far as we can tell) was “Another Characterization of Circles”, in the American Mathematical Monthly, when he was in 11th grade.

Wu-Teh comes from a distinguished mathematical family and has been active in mathematics education in China. He and his wife, Marjory Baruch, have three children: Mina, Solomon, and Sabrina.



Humboldt Research Fellowship, Waldron Award for Excellence in Research at North Dakota State University, and Among One Hundred Outstanding Young Chinese Scientists, Chinese Academy of Sciences. He has held research grants from NASA, NSF, CDC, US Air Force, and the Chinese Academy of Sciences.



While at SU, Yuesheng supervised 9 PhD students, plus 14 more at Academia Sinica and Zhongshan University (jointly with Prof. Z. Chen). He is Managing Editor of the journal *Advances in Computational Mathematics*, and Associate Editor for *J. Integral Equations and Applications* and *J. System Sciences and Mathematics*.

He has also been an exemplary citizen, serving on the department’s Graduate Committee and the College Promotion and Tenure committee, among others.

Yuesheng is the founding Director of Guangdong Province Key Laboratory of Computational Science of China, President of the Guangdong Provincial Society of Computational Mathematics through 2015, and since 2009 has been Guohua Chair Professor at Sun Yat-sen University.

### Yuesheng Xu

also retired in December 2013. A distinguished numerical analyst, he has over 130 publications in wavelet analysis, image and signal processing, and related areas.

Yuesheng came to SU in 2003 from West Virginia University, where he was the Eberly Family Professor of Mathematics. His honors include a

## 2013 Doctorates

**Liang Zhao** completed his dissertation, “Filter-based multiscale entropy analysis of complex physiological time series”, under the direction of Yuesheng Xu. He will move to Singapore with his wife who graduated from SU in May with a Ph.D. degree in economics and now a faculty member at Singapore Management University.



**S. Zeynep Ozal** completed her dissertation, “Extension properties of pluri-complex Green functions”, under the direction of Dan Coman. She returned to Istanbul, Turkey this summer and expects to spend time at Sabancı University. Zeynep also got married this summer.



**Jeremy Entner** completed his dissertation, “Methods of non-parametric multivariate ranking and selection”, under the direction of Pinyuen Chen. He is now an Assistant Professor in the Mathematics & Statistics Department at the University of Tennessee at Martin.



**Dayal Dharmasena** completed his dissertation, “Holomorphic fundamental semigroup of Riemann domains”, under the direction of Eugene Poletsky. Dayal has returned to Sri Lanka to be an Assistant Professor at the University of Colombo. He and Prof. Poletsky continue to collaborate on mathematical projects.

## 2013 Graduate Awards

*Donald E. Kibbey Prize in Mathematics*

*for excellence in the Ph.D. program*

**S. Zeynep Ozal**

*Robert M. Exner Prize in Mathematics Education*

**Joseph Grace** *for excellence in his master's exam*

**Lenny Kamau** *for excellence in his qualifying exam*

*Outstanding Teaching Assistant Award*

*University-wide award recognizing excellence as primary instructors or recitation instructors*

**Christa Carsten** and **Leonard Kamau**



# Grad Student News

## 38th Annual NYS Graduate Mathematics Conference

The **Mathematics Graduate Organization** hosted this year's MGO Conference at SU on April 13, 2013. The Opening Address was "Conformal Compactifications in Differential Geometry" by John M. Lee of the University of Washington, and the Keynote Lecture was "They Grind Exceeding Small" by Robert S. Strichartz of Cornell University.



Sectional talks were given by students from Binghamton University, University of Illinois, University of Rochester, and Worcester Polytechnic Institute, as well as by SU graduate students **Melissa Voldan**, **Ozcan Yazici**, **Khim Shrestha**, and **Josh Stangle**.

New this year was the one-day format of the conference, making it easier to attend the event from longer distances. This format will be used in 2014 as well.

The **39th Annual MGO Conference** will take place on April 12, 2014. Spread the word!

*Q: What's an anagram of Banach-Tarski?*

*A: Banach-Tarski Banach-Tarski.*

*Graduate students relaxing at Pratt's Falls. From left to right: Ray Garzia, Jordan Johnson, Carl Ragsdale, Rachel Gettinger, James Heffers, Laura Ballard, Collin Bruce, Maureen Jeffery, Jennifer Jordan, Stephen Edmond, and Robert Roy.*



## Other Activities

The MGO held 11 **MGO colloquia** in 2013, with talks given by graduate students, postdocs, and faculty. For example, grad student **Ben Cortese** gave a talk titled "The Benefit of More Information: Improvement in Sensitivity and Specificity of Tissue Classification by MRI through Sequential Addition of Variables", and **Claudio DiMarco** spoke on "A Curve of Positive Area".

The annual **MGO Picnic** took place September 21 at Pratt's Falls.

All these events were made possible by the efforts of graduate students, most of all the MGO officers: President **Patrick Biermann**, Vice President **Ben Cortese**, Treasurer **Patrick Neary**, Secretary and Undergrad Committee Representative **Melissa Voldan**, Colloquium Organizer **Josh Stangle**, and GSO Senators **Claudio DiMarco** and Patrick Biermann.

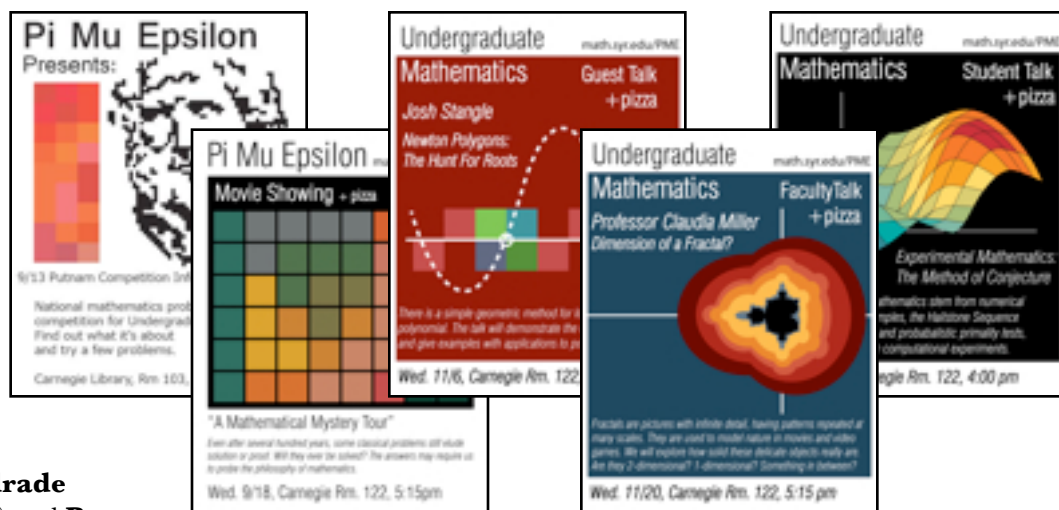


# Math Major News

Our chapter of **Pi Mu Epsilon** underwent a transition when four of five officers graduated in May. Two of the officers went to graduate school: **Gordon Jones** (University of Michigan) and **Keeley Naughton** (Texas Christian University). Two others now apply their mathematical skills in the financial industry: **Joe Andrade** (Hanover Insurance Group) and **Ben Hatch** (J.P. Morgan). The 2013-14 Pi Mu Epsilon officers are **Craig Allen**, **Dylan Hsu** (president), and **Steve Sorokanich**.

Five new members were inducted in April: **Craig Allen**, **Grant Griffiths**, **Steve Sorokanich**, **Xin Tian**, and **Ashley Valentijn**.

Some of the chapter activities during the year were career-oriented: the informational session “How to Become an Actuary” and problem-solving group meeting focused on the actuarial exam in Probability. Another recurring theme was connections of mathematics with computer science. Dylan Hsu gave a presentation on the Collatz algorithm (also known as the Syracuse problem) which featured interactive exploration of the patterns in the stopping time sequence. Steve Sorokanich explained the mathematical basis of probabilistic primality testing, the method of generating large “industrial-grade primes”. Adding to the theme were faculty talks on



computable numbers (by Prof. Kovalev) and the map coloring problem (by Prof. Horn), the latter being a famous example of a computer-assisted proof.

One talk was by a graduate student: Josh Stangle described the use of Newton polygons for locating roots of a polynomials. Prof. Miller’s presentation on dimension of fractals concluded the program for the year.

Throughout the Fall semester, the chapter ran problem-solving sessions, partly as preparation for the Putnam contest. Seven students took part in the notoriously difficult nationwide contest in December.

Math majors continued to garner accolades and distinctions across the College and the University:

*See MAJORS on page 10*



*PME induction ceremony in April 2013. Left to right: Randi Rodecker, Ashley Valentijn, Stan Hoffman, Gordon Jones, Joe Andrade, Craig Allen, Ben Hatch, Keeley Naughton, Grant Griffiths, Steve Sorokanich, Dylan Hsu, Xin Tian, Shuo Zhang*



# Epsilons and Deltas

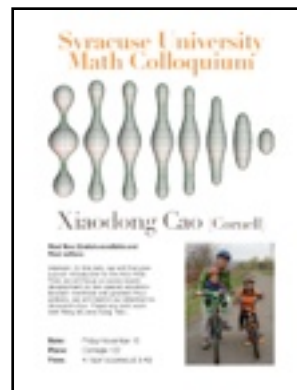
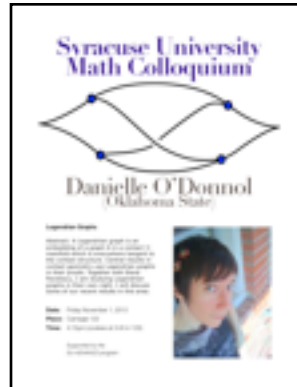
*News items from the Department,  
not necessarily arbitrarily small!*

Office administrator **Pat O'Malley resigned** at the end of the summer to move back to Atlanta, Georgia. She has taken a position at Georgia State University. Best wishes for health and happiness and new opportunities, Pat!

New faces have also appeared in the office. **Julia O'Connor**, who previously worked in Human Resources, is our new Office Administrator, and **Ben Cooper**, is temporary Secretary to the Chair. Graduate student **Patrick Neary** is serving as President of the University's Graduate Student Organization. He is also Director of Administration for the National Association of Graduate-Professional Students, and represented the University's graduate students on the Chancellor Search Committee.

The **mathematical genealogy of the Department** has been updated, and now includes not only all current department faculty, but all living emeritus faculty as well! We've also changed how it is displayed on the web, which should make it available on all platforms. Follow the link from [math.syr.edu/Department.htm](http://math.syr.edu/Department.htm) or [click here](#).

Professor Emeritus **Erik Hemmingsen** passed away on December 30, 2012. He was a member of the SU community for 40 years, including 8 years as the Chair of the Mathematics Department.



*A selection of recent colloquia.*

## 2013 Undergraduate Awards

### *Archimedes Prize*

*awarded annually in recognition of outstanding achievements in undergraduate mathematics*

**Joseph B. Andrade IV (BS '13)**

Actuarial trainee, Hanover Insurance Group

**Benjamin Hatch (BS '13)**

Financial analyst at J.P. Morgan

**Jaimee Robertson (BA '13)**

Graduate student (SU, Chemical Engineering)

### *Euclid Prize*

*A new prize, introduced in 2012, awarded to the most promising math majors who are not graduating in the year of the award.*

**Dylan G. Hsu '12**

**Randi Rodecker '12**

## Alumni Updates

**Ashley Prater (PhD '12)** has accepted a position at the Air Force Research Laboratory.

**Justin Cyr (BS '11, MS '12)** is a second-year graduate student at Indiana University, where he received the Department of Mathematics James P. Williams Memorial Award, awarded each year to outstanding graduate students in recognition of their performance during the first year of their graduate studies.

**Michael Bochner (BA '03)** earned his MBA from the University of Rochester in 2009, and works as an Actuarial Analyst for Excellus BlueCross BlueShield in Victor, NY.

**Matt Boelkins (PhD '98)** was promoted to full professor at Grand Valley State University in 2012. He is Associate Editor of PRIMUS (Problems, Resources, and Issues in Mathematics Undergraduate Studies) published by Taylor&Francis, recipient of the 2013 Michigan

MAA Distinguished Teaching Award, and author of a free, open-source online calculus text titled [Active Calculus](#).

**Joseph Kirtland (BS '85)** earned his PhD in mathematics (finite group theory) in 1992 from the University of New Hampshire. He is now a full professor of mathematics at Marist College in Poughkeepsie, NY.

**Kap Byung Yoon (PhD '58)** is a member of the National Academy of Sciences of the Republic of Korea. Since 1991 he has been Professor Emeritus of Kyunghee University.

**Henry Gordon Rice (PhD '51)** is best known for Rice's theorem in computability theory, which says (roughly) that any non-trivial property of the language of a Turing machine is undecidable. Rice was Professor of Mathematics at the University of New Hampshire for many years.

### MAJORS from page 8

▶ **Joseph Andrade IV** was awarded one of the 2013 Chancellor's Awards for Public Engagement and Scholarship (CAPES), which recognizes students who exemplify SU's commitment to engagement with the community and "Scholarship in Action".

▶ Two 2013 graduates earned Bachelor of Science degrees with Distinction: **Benjamin Hatch** and **Gordon Jones**.

▶ The 12 University Scholars in 2013 included graduating seniors **Ryan Badman** and **Jaimee Robertson**.

▶ Mathematics major **Garrett Lee** was chosen to be a 2013-2014 Remembrance Scholar. This award is given to seniors chosen for distinguished scholarship, citizenship, and service to the community.

▶ **Stephanie Krantz** served as Class Marshal at Commencement 2013.

▶ **Daniel Kepple '13** was awarded a Benjamin A. Gilman International Scholarship to support his study abroad in Hong Kong.

▶ Inductees into Phi Beta Kappa included **Ryan Badman, Tianxiong Chu, Xinyi (Shirley) He,** and **Randi Rodecker**.

You can follow all the activity in the department on Twitter ([@SUMathematics](#)), Facebook ([SUMathdept](#)), and the web ([math.syr.edu](#)).

## What Have **You** Been Up To?

We'd like to hear from you! **The Archimedean** is published by the Mathematics Department of Syracuse University to keep its students, alumni, and friends informed about news and events in the department.

You can detach and return this page for our alumni/ae files. Please mail it to 215 Carnegie Library, Syracuse University, Syracuse NY 13244, fax it to 315-443-1475, or email the information to Graham Leuschke at [gjleusch@math.syr.edu](mailto:gjleusch@math.syr.edu).

Name \_\_\_\_\_

Syracuse University Degree(s) with years & advisors \_\_\_\_\_

Degrees from other Universities/Years \_\_\_\_\_

Home Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Home Phone \_\_\_\_\_ E-mail \_\_\_\_\_

Firm/Institution \_\_\_\_\_

Position \_\_\_\_\_ Business phone \_\_\_\_\_

**Information about yourself or comments on the newsletter:**





SYRACUSE UNIVERSITY

# The College of Arts and Sciences

## Department of Mathematics

### Consider supporting the Department

The Mathematics Department would like to thank its alumni and friends for their past generous support. Gifts to the Department enhance our ability to compete for the strongest undergraduates and graduate students, to support bringing in speakers for seminars and colloquia, and to send our graduate students to conferences nationwide. If you would like to help us in these efforts by making a general contribution to the department, please visit [secure.syr.edu/giving](https://secure.syr.edu/giving), choose “Other” from the menu, and enter “Mathematics Department” in the box. You can also specify the Kibbey Fund or the Undergraduate Fund to support specifically graduate or undergraduate students, respectively.