



Fall 2005
Issue 3

Mathematics Annual
Newsletter

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<http://www.rose-hulman.edu/math/newsletter>

THE ROSE Polygon



Chairman's Corner

Dr. S. Allen Broughton



It has been some time since we last sent out a newsletter but it has not been for lack of news. Patti Staggs (now in the Chemistry Department) is such an expert at newsletters that we tried very hard -- and were successful for some reason --- to sweet talk her into being editor for this newsletter.

Students Rose-Hulman is about students so let's talk about them first. As you may no doubt know the Mathematics Department's big job is to teach every entering student five or six foundational mathematics courses in their first two years. Our students are coming to Rose with better and better qualifications with each passing year. Ten years ago the total number of students with AP credit, college, or Fast Track Calculus credit was less than 90 students. This year 225 entering freshman had AP credit, college credit, or had participated in the Fast Track program. In terms of percentages, over the last five years 45% of entering students had credit for at least one Calculus course. The Fast Track Calculus program which gives students credit for the entire freshman Calculus sequence

continues at slightly above 10% of the freshman class. Apparently this granting of credit does no harm to the student and has many positive effects. A study conducted a few years ago showed that - on the average - the more credit in math a student had before beginning their freshman year, the higher a student's freshman math GPA and overall GPA would be. Anecdotally, we observe that students are getting more minors, double majors, are completing more school year internships, and some are graduating early because of their AP credits.

The number of math majors, especially double majors, continues to increase. We will soon go over 20 math majors and double majors a year, definitely up from the mid '90's. As in the past there are many other students from other majors populating the post Calculus and DE classes. There is an excellent collaboration between the Computer Science department, and about 50% of all our graduates are Computer Science and Math double majors. The math-first graduates are going to graduate school and industry in comparable numbers. (see the list of recent grads in the alumni section). We would like the number of math-first grads to increase, 20 a year would be nice and could be easily accommodated with current faculty. One of the difficulties is to convince students that there are

Chairman's Corner cont...

good careers out there with a math degree. You can help us in that endeavour by giving us feedback through the alumni survey (details on the alumni page).

We are proud of our students and their accomplishments. Please take a moment to read about them on the student page.

Faculty We are extremely lucky to be able to recruit very good faculty. Like most other departments at Rose, about 40% of the Department has been at Rose for less than 5 years. Though the infusion of new faces, ideas and enthusiasm helps us remain a vital department, the other 60%, who are enthusiastic and engaged, balance the newness with experience, the Rose traditions, and leadership. You can read more in the Faculty News section.

Advisory Board All departments at Rose have advisory boards. Our board, which is only a couple of years old, consists of mathematicians from academia and industry, alums and non-alums and a high school teacher. Our first meeting was Fall 2003 and it has taken us two years to implement their recommendations. Some of the major suggestions that we implemented were to revise our Statistics concentration in the major to a Statistics and Operations Research concentration, offer a statistical computing course, and to require all math majors to complete a senior project or thesis. We should note that the statistics enrollments in upper division courses are growing very nicely after initial revision of our program by Leroy Franklin and subsequent revision by Diane Evans and Mark Inlow. Our next meeting with the board will be in the spring and will focus on where the department should be in 10 years.

2015 As you no doubt have heard Rose-Hulman is in the planning stages of where we will be in the next 10 years. We have had some initial discussions in the department, in addition to the discussion we will have in the spring with our advisory board. We would be very pleased to hear your thoughts; just send me an email.

Thank you I'd like to give a special thanks to all of you who have given us gifts over the last few years. Many of the student activities you'll read about in this issue have been partially supported by your generosity, especially through the Ted Palmer Student Conference Travel Fund. This fund is especially helpful for students who want to present their results at a professional conference, or just accompany us to one of the local mathematics conferences to learn about mathematics, participate in a math contest, and meet other mathematics students.

We wish you all the best in the coming year.

Faculty News



Prof. Leader



Prof. Finn

Granted tenure are professors **Jeff Leader** and **David Finn**.

Prof. Leader's areas of specification are numerical analysis, scientific computation, and chaos. He recently gave a co-authored paper at the 2005 Joint Math. Meetings, and has written a textbook on numerical analysis for Addison-Wesley Longman.

Prof. Finn's areas of specialization are partial differential equations, differential geometry, and calculus of variations. His research activities include applications of nonlinear elliptical partial differential equations to differential geometry and mathematical physics.

Faculty and Staff Coming and Going: Many Changes



Prof. Tom Langley



Prof. Tanya Leise



Prof. Jerry Muir

Three of our valued faculty members, Dr. Tanya Leise, Dr. Jerry Muir and Dr. Tom Langley have left Rose-Hulman. Prof. Leise has elected to take a position at Amherst College, while Prof. Muir has chosen to work at the University of Scranton. Both Tanya and Jerry have spouses who will be teaching at nearby institutions. Dr. Langley is returning to his native California. They will be missed, but we wish them the best of luck with their pursuits.



Prof. McMurdy

New to the Department (Fall 2004) are Dr. Ken McMurdy, Dr. Steve Gallanaitis and Dr. Brian Martensen. Prof. McMurdy comes to us from UC Berkely where he received his Ph.D. in 2001. His areas of specialization are Algebraic Number Theory and Arithmetic Algebraic Geometry. Prof. Gallanaitis received his Ph.D. from Virginia Polytechnical State Institute and State University in 1999. Integral equations and associated hysteresis modeling are his areas of specialization. Prof. Martensen received his PhD in 2001 from Montana State University. His areas of specialization includes Dynamical Systems Topology, Aperiodic Tilings and Sequences.



Prof. Martensen



Prof. Gallanaitis

Virginia Naibo – Joined the department this Fall as a tenure track appointment from the University of Kansas. Interests: Partial Differential Equations: Schrödinger wave equations, Strichartz estimates.



Other new faces include **Diane L. Evans** Assistant Professor of Mathematics, joins us from the College of William and Mary in Williamsburg, VA. Specializations: Probability and Statistics/Operations Research/Quality Control. Ph.D. from William and Mary, 2001.



Joshua B. Holden: Assistant Professor of Mathematics, joins us from Duke University in Durham, NC. Specializations: Number Theory/Cryptography/Algebra.. Ph.D. from Brown University, 1998.



Mark H. Inlow: Assistant Professor of Mathematics, joins us from University of Arizona. Specialization: Statistics. PhD. From Texas A&M University, 2001.

Mike McLeish, Systems Administrator for Mathematics and Computer Science and Software Engineering departments, joins us from Chateaux Software Development. He is responsible for overseeing and maintaining the computing environment for the Math and CSSE departments.



LOPEZ RETIRES

Robert Lopez retired after 18 years in the Math Department.

Dr. Lopez areas of expertise include Applied mathematics, ODE's and PDE's general relativity, numerical analysis, and use of Maple in the classroom.



In 1997 Lopez was honored with the Board of Trustees Outstanding Scholar Award.

He is presently working with the staff of Waterloo Maple Software.

Homecoming 2005

We appreciate all of you who came by to visit during Homecoming. During Homecoming week we had a visit from James Kuzmanovich an '65 alum who is Professor of Mathematics at Wake Forest University. Jim gave a very nice talk on student research, and we had a chance to compare notes between Rose and Wake Forest. Jim got a chance to visit with Professor Emeritus Al Schmidt, whom many of you know. Professor Schmidt remembers Jim as a student!

Leader & Shibberu on Sabbatical 2005-2006

Dr. Jeffery Leader will be working as a researcher at Sandia National Labs. (Dept. of Energy) in Albuquerque, NM, on computational biology.

Dr. Yosi Shibberu will be on sabbatical at the Washington University Medical School, Center for Computational Biology. He will be working on problems in protein folding with leading researchers in the area.

Carlson, Rickert Return From sabbatical

Professor **Steve Carlson** spent his sabbatical during the winter and spring terms of the 2004-2005 academic year as a



Visiting Mathematician with the Washington, DC, headquarters of the Mathematical Association of America.

His duties, which fall under the direction of the MAA's Department of Programs and Services, involved supporting MAA regional sections and special interest groups, promoting new MAA curricular and educational incentives, facilitating professional devel-

opment opportunities, and other assignments as they arise.

Also, during summer of 2005 Steve will be presenting a workshop entitled "Undergraduate Topology: An Intuition-Based and Example Driven Approach" as part of the MAA's 2005 Professional Enhancement Program.



Professor **John Rickert** was on sabbatical for the school year 2004-2005 working for the National Security Agency. Rickert joined the RHIT faculty in 1990.

PROMOTION

Dr. Kurt Bryan has been promoted to Full Professor. Dr.

Bryan has been teaching at Rose-Hulman since 1993. He received his



B.A. in mathematics from Reed College in 1984 and his Ph.D. from the University of Washington in 1990. He then spent 3 years in a post-doc at the Institute for Computer Applications in Science and Engineering (ICASE) at NASA Langley Research Center in Hampton, Virginia. He also worked from 1984 to 1990 as a statistician and mathematician at Blount Industries in Portland, Oregon.

Department News

The Rose-Hulman Institute of Technology Undergraduate Mathematics Journal has just completed its fifth year according to Roger Lautzenheiser, who founded the journal. It can be found at <http://www.rose-hulman.edu/mathjournal/>. The journal publishes 2 issues per year (spring and fall), and during the past 5 years, 57 papers with 91 authors have appeared. The authors are all undergraduates, and there is a broad range of topics - from very pure mathematics to applied mathematics. Some topics are based on research experiences while others might come from a senior project. Although the paper need not contain original research in mathematics, it must be interesting, well written, and at a level that is clearly beyond a typical homework assignment.

We should also note that Roger Lautzenheiser is still the editor-in-chief. David Rader is assistant editor, and several members of the mathematics department help referee the papers. Roger and one of the authors, Tram Hoang, a student at California State University at Fullerton, will have a short paper titled Creating and Publishing an Undergraduate Mathematics Paper published this



November in Math Horizons, a national publication of the MAA.

If you have any questions or would like to be put on our list of possible referees, please send an email to: roger.lautzenheiser@rose-hulman.edu

SUCCESS!

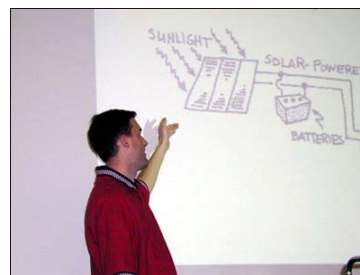
Rose-Hulman Institute of Technology Conference on Undergraduate Mathematics.

Dr. Diane Evans

The goal of the Rose-Hulman Institute of Technology Conference on Undergraduate Mathematics is to spotlight and celebrate the accomplishments and work of undergraduate mathematicians. We typically invite three talks from professional mathematicians, but all other talks are contributed by undergraduate students on mathematical topics. Appropriate material for contributed talks runs the gamut from challenging class projects to expository talks on interesting mathematical topics to work done with a faculty member or research done in an REU.

The conference was held March 18-19, 2005. The theme of this year's conference was "What general statements can/should be made about

using mathematics to describe reality?" We were pleased to have had two inspiring invited speakers whose research areas explore this topic. The speakers were Dr. John Casti from the Institute for Monetary Economics, Technical University of Vienna and



Commodicast, Inc. and Dr. Chris Pincock from Purdue University.

We received a conference grant from the Mathematical Association of America MAA NSF-RUMC (NSF grant DMS-0241090) to provide funding for our invited faculty speakers.

Next Conference

The 23rd conference will be held **March 31 & April 1, 2006**. The organizers are **Dr. David Rader** and **Dr. Joshua Holden**.

Invited speakers are: **Dr. Michael Rosen**, Brown University, *The Zeta Function for Beginners, Irreducible Polynomials Modulo p* and **Dr. Allen Holden**, Trinity University, *Optimal Oncology*.
www.rose-hulman.edu/mathconf/

Student News

AWARDS

Indiana Collegiate Math Contest: *Stephen Dupal, Dean Fehlau, Peter Fine, Curtis Katinas, Adam Outcalt, Hari Ravindran, Angela Smiley, Guy Srinivasan, E. Kellan Wampler and Sara Zenner*

Putnam Competition: *Guy Srinivasan and E. Kellan Wampler were recognized for finishing in the top 500 in the participates.*

Two Rose-Hulman teams received Honorable Mention at the **MCM Competition**, putting them in the top 35% of teams. Team 1: *Peter Fine, Curtis Katinas* Team 2: *Guy Srinivasan, Eric Borzello, Matt Ellis*

Hari Ravindran received the **Weaver student summer research award** for summer 2005. Hari did work on "Modeling the Shape of a Cookie" with research mentor Dr. David Finn.

Receiving Awards at the Spring Honors and Awards Banquet



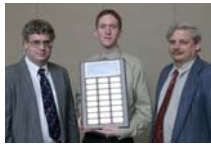
Dr. Leader
E. Kellan Wampler
Dr. Broughton



Havi Ravindran



Angela Smiley



Adam Occult



Stephen Dupal



Dean Fehlau



Peter Fine



Curtis Katinas

<http://www.rose-hulman.edu/math/awards.php>

Alumni News

Alumni Web Page

<http://www.rose-hulman.edu/math/alumnicareers/alumni.php>

We would like this page to contain short profiles of our mathematics alumni. (So far we have one!) The alumni who appear here have agreed to share their profiles so that our current and prospective students will have a better idea of the diversity of careers for students of mathematics. One of the better kept secrets is the enormous career potential of a degree in mathematics, especially one with an emphasis on

problem-solving as we offer at Rose-Hulman. Each Profile gives the alum's name, their degree and year of graduation, further education, a paragraph or so on their career progression, accomplishments, and any advice they would like to share with students. Alumni who have agreed to have communication with our current and prospective students have given an email address. Additional information about the alum, or their personal or business web page may be included as links.

We welcome your contributions. If you are interested in contributing to our alumni webpage or to our newsletter, please email:

allen.broughton@rose-hulman.edu

Disclaimer: The links to the web pages are included to complement the profile and are not meant as endorsements.



We are sorry to report that William (Bill) Ritter died in April 2003. His widow, Mary Lou, is living in Indianapolis.

May 2005 Graduates



Can you help us fill in the missing information in this chart?

Please email Terri.Moscan@rose-hulman.edu with any information you might have.

Barker, Brian	Indiana University - Mathematics
Castro, Catherine	
Jones, Bradley	
McCormick, Matt	University of Texas @ Austin
Srinivasan, Guy	Microsoft
Wampler, Kellan	Indiana University - Math
May 2004	
Groven, Jeremy	
Mollan, Scott	Ohio State University - Statistics
Ross, Brandon	
Trainor, Nic	Rutgers Universtiy - Mathematics
May 2003	
Barlow, Eva	MIT Lincoln Labs
Crumley, Joshua	Allmerica Financial
Doll, Trevor	
Smith, Philip	
Stoner, John	
Strodtbeck, Joshua	University of Kentucky – Math

Alumni survey All departments at Rose-Hulman are conducting a survey of their alumni. Though mostly for program assessment purposes we are hoping that some of the feedback will give us a clearer idea of current employment opportunities for math grads and long term career progression. As always, the number 1 question we get in recruiting students is: “I like math but what kind of job can you get with a math degree”. Of course the questions is a bit more intense as graduation nears. Your answers and comments on the survey will help greatly. The initial request for responding to the survey went out by email to math alums, we will do a post-card follow-up to all alums in November. <http://www.rose-hulman.edu/math/survey/alumni.php>

A picture is worth...



A Blast from the Past!

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8
7



From left: Mary Lou McCullough, Gary Sherman, Roge Lautzenheiser, Brian Winkel, Robert Lopez, Alfred Schmidt, Elton Graves, Dan Scott, Margie Hale.

The RosePolyGon

This newsletter is published by the Rose-Hulman Institute of technology Mathematics Department.

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