R·I·T
Department of
Mathematics and Statistics
Newsletter
V. 19, No. 2, May 2005

FOCUS ON THE DEPARTMENT

The Graduate Program

By Hossein Shahmohamad,
Director of Graduate Programs, Department of Mathematics and Statistics

In 1994, the Graduate Program in the Department of Mathematics and Statistics was launched. With large companies like Kodak and Xerox in the area, there was a large supply of quality candidates with a Bachelors degree that were interested in a more advanced degree in science or mathematics. The program ran successfully for a few years, with 5 graduates. The program had plenty of applicants outside of industry, but because the college could not offer financial support to any of its graduate students, many of the applicants that were accepted decided not to come. With a downturn in the economy, companies were less inclined to provide support and so enrollment dropped. The program was temporarily placed on hold by the Dean of the College of Science. Although we were no longer running the program, a group of faculty members continued to work on maintaining, improving and modifying the organization and structure of the program in expectation of its eventual reinstatement.

The Department initiated a comprehensive five year plan in 2001. With the support of Department Head Sophia Maggelakis and College of Science Dean, Ian Gatley, the plan outlined goals of improved teaching, increased faculty and student scholarship, and increased service to the University.

We had many new initiatives in the five year plan, and among them was the reinstatement of the Graduate Program in Applied Mathematics. Extremely important to the reinstatement of the program was the restructuring of the format of the main calculus sequence that many students at RIT are required to take. This new sequence (which is still widely used) emphasizes workshops and projects. Workshops are held twice a week (in addition to four lectures per week) and are run by the instructor with the help of a teaching assistant. These teaching assistant positions are filled by the graduate students. The graduate students are, of course, paid for their services and this assistantship (currently $10,000) can be supplemented by $1,000 to $6,000 in scholarships to qualified can-

(Continued on page 3)

Faculty News

David Farnsworth, mathematics and statistics professor, had his article "For which x-values does a least-squares parabolic fit exist?" published in the Spring 2005 issue of Mathematics and Computer Education.

Harry M. Schey, professor in the Department of Mathematics and Statistics, has accepted a contract offered by McGraw-Hill to review one of their recent statistics texts.

Hossein Shahmohamad, assistant professor in the Department of Mathematics and Statistics, attended the 2005 PA-SSHE-MA annual Mathematics conference of Pennsylvania State System of Higher Education on March 18-19, 2005 at Millersville University in Lancaster, PA. He presented a talk on “Counting All Distinct Amallamorphs of Graphs.”

Bill Basener, assistant professor in the Department of Mathematics and Statistics, coauthored the paper "Periodic Prime Knots and Topologically Transitive Flows on 3-Manifolds," with Michael Sullivan of Southern Illinois University; the paper was accepted

(Continued on page 5)

Table of Contents

New Faculty

Dr. Joseph DeLorenzo, a visiting professor in our department has a long and distinguished career in electrical engineering and mathematics. He received his Bachelor's of Science in Electrical Engineering and for 16 years worked at Long Island experimenting on radar systems. During that time he found time to take classes and received a Masters Degree in Electro-physics at the Polytechnic Institute of Brooklyn.

Dr. DeLorenzo went on to work at Sperry Research Center in Massachusetts continuing research on radar systems. He was able to take classes during the day at Boston University and earned a Ph.D. in mathematics, studying "ultra wide-band" systems.

Next, Dr. DeLorenzo went to Xerox where he held numerous positions in management. Before early retirement, Dr. DeLorenzo was Manager of Tech Development and oversaw approximately 120 employees. Despite management responsibilities, he continued to collaborate in research projects.

Dr. DeLorenzo was hired as a consultant for one quarter by RIT School of Printing to create and teach a course in "Electronic Communications in the Printing and Publishing Industry." At the department's request, he continued to teach the course for two additional years. He was later hired by the Electrical Engineering Department and taught for 11 years where he retired in 1996 as Professor Emeritus.

Dr. DeLorenzo became a part owner of a local engineering company but came back to RIT a few years later to help the Electrical Engineering Department when there was a shortage of instructors. He is now with the Department of Mathematics and Statistics teaching the project-based calculus classes along with mentoring research for many of our students.

Outstanding Undergraduate Scholar

Lukas Habegger grew up in a small village in Switzerland. After high school, he was one of 150 internists for a large pharmaceutical company in Switzerland to receive a full year scholarship to attend college in the United States. He attended Niagara County Community College for one year before transferring to RIT. Mr. Habegger is now a 4th year student pursuing a dual major in Bioinformatics and Statistics. He is the recipient of the RIT Nathaniel Rochester Society Scholarship, RIT Trustee Scholarship, and the RIT Phi Theta Kappa Scholarship. Additionally, Mr. Habegger continues research in the origin and evolution of the genetic code he began at the pharmaceutical company in Switzerland .

WINTER DEAN'S LIST

Ali Al-Raisi*
Mitchell R. Bacot
Julia R. Bethel*
Michael E. Bird
Julie C. Blackwood
Jonathan R. Bradley
Natalie R. Bragg*
Heather M. Brazeau*
Matthew J. Denton*
Richard C. Dirmyer
Timothy J. Doster
Gregory Dufore
Theodore Dziuba
Rym Ferahtia
Michael Ferguson
Ryan M. Fuller*
Matthew George
Andrew L. Goldman
Aaron Kaufer*
Devin C. Koestler
Joshuah S. Latimore*
Tracy M. Lester
Jessica A. Lewis
Matthew J. McEvoy
Jeffrey A. McLean
David Mittiga*
Richard Moreton*
Caitlin O'Donnell
Daniel P. Pike
Margaret Pokorny
Renee A. Reeves
Nathan Reff *
Elizabeth M. Ryskowski
Martin Setto
Nicolas Shayko
Michael D. Short*
Shelley Speiss*
Chris Steinkirchner
Marc Weinmuller*
Heather Wheater
Brian J. Witkowski*
Robert Yates*
Hye Yon Yi

(Continued from page 1)
didates.

The graduate program addresses the need for the education and training of people in the areas of mathematics that can effectively be used to deal with problems encountered in business and industry and emphasizes the computational tools available for solving various problems. The goal of the program is to help the student realize the potential for the methodology as a general tool in the study of a variety of problems in business and industry as well as to provide specific mathematical tools necessary to analyze a particular problem in which the student is interested.

The program is open to qualified candidates with a Bachelors degree in mathematics or a related science. It is also open to qualified undergraduate students at RIT that can enter into a BS/MS dual degree program with only one year of full-time study beyond the usual undergraduate requirements.

The program consists of 48 quarter credit hours of study divided into "core courses," a collection of courses constituting a "concentration" and a thesis or project work. The optional cooperative education (co-op) program may be used to gain valuable industrial or business experience as well as financial support while the student is enrolled in the graduate program.

Since the program was reinstated, the first graduate was **Joseph Rhoads** in 2004. Currently, the program has 15 students, seven of whom will graduate this year. They are **Christopher Cappon**, **David Fraser**, **Gillian Galle**, **Kevin Gonzales**, **Kathryn Morgan, Carol Panepinto** and **Olin Stratton**.

For more information on the program, please contact the Graduate Programs Director, Dr. Hossein Shahmohamad at hxssma@rit.edu or (585) 475 7564.

I would like to thank **Prof. Seshavadhani Kumar** for correcting some of the details of the graduate program prior to 2001 and for his work in setting up and maintaining the initial program.

2005 John D. Paliouras Award for Outstanding Academic Excellence Recipient

The 2005 recipient of the John D. Paliouras Award for Outstanding Academic Excellence is **Julia Bethel**. Julia is a 4th year Applied Mathematics major who carries a 4.0 PFOS and Cumulative GPA and has been involved with research activities. Last summer, Julia conducted an RIT Honors Program funded research project with Dr. Patricia Clark. The project modeled the epidemic lifecycles of meningococcal meningitis in the six countries that comprise the African meningitis belt, consisting of Benin, Burkina Faso, Central African Republic, Chad, Ethiopia and Niger. Julia's 2004 research analysis and results were presented to the RIT Board of Trustees and were provided to the World Health Organization at its request. Additionally, she has presented at several national level mathematical conferences, including the January 2005 MAA-AMS-SIAM Joint Conference in Atlanta, GA. Julia is a recipient of several honors and scholarships. Please join us in congratulating her on receiving this very prestigious departmental award for her outstanding achievements.

The annual presentation of the John D. Paliouras Award for Outstanding Academic Excellence took place during the Department of Mathematics and Statistics Honors and Awards Ceremony on Friday, April 29th. The Award recognizes a third year or above major from the Computational Mathematics, Applied Mathematics or Applied Statistics program who has achieved a cumulative and PFOS GPA of 3.5 or above and who has conducted student research or non-class projects in mathematics or statistics. The award was initiated in 2003 and is named in honor of our long-time colleague, faculty member and former College Of Science dean John D. Paliouras.

This Year's Graduates

UNDERGRADUATE

Computational Mathematics
Dennis Allen Colburn
Matthew Donald Ford
Gillian E. Galle (HH)
Nicholas R. Greene (H)
Victor Kostyuk (HHH)
Marc Anthony Merius
William Randall Orr
Robert St. Pierre
James Urick

Applied Mathematics
Mitchell R. Bacot
Truc (Joni) Mai Borrelli (HHH)
Richard Dix Cunningham
Michael Patrick de la Fuente
Kevin Edmond Gonzales (HH)
Joshuah Shane Latimore
Christine Lennon
Benjamin Walker Lewis
Jocelyn Shi Lin Loo
Jeffery Allen McLean
Tamika Natasha Messam
Jeremy Audric Nieman
Chris Andrew Steinkirchner (H)
Samuel Steven Thieme
My-Trinh Thi Tran
Justin David Turk

Applied Statistics
Corey James Bolsei (H)
Heather Marie Brazeau (HHH)
Neil Brenner (H)
Gregory John Dufore II (H)
Nicolas Basesky Germain (HH)
Stephanie Lynn Jones (HHH)
Elizabeth Anne Meyer (H)
Elizabeth Marie Ryskowski
Tiffany M. Swasta (HHH)
Kathryn Ann Webb (H)

H – Indicates Graduating with Honors
HH – Indicates Graduating with High Honors
HHH – Indicates Graduating with Highest Honors

GRADUATE DEGREES

Applied Mathematics
Christopher Cappon
David Fraser
Gillian E. Galle
Kevin Edmond Gonzales
Kathryn Paige Morgan
Carol Panepinto
Olin D. Stratton

A Co-op Experience

Paul Martino, a 5th year Applied Statistics major in the department, has begun a co-op in April of this year at NTID with researcher Sara Schley. Paul's co-op job for the NTID Department of Research involves an investigation of data taken since 1960 on women, young adults and children. Paul is assisting in analyzing and comparing characteristics of hearing and deaf siblings among the children. In particular, the study will focus on differences between the hearing and deaf siblings in work experience, college education, and psychological and physical traits. One purpose of this study is to identify tools that will be useful in teaching deaf students.

Paul is enjoying his co-op experience that puts to use the statistical and computational skills he has acquired in his studies here during the past four years. He hopes to pursue graduate work in econometrics after completing his undergraduate studies.

Quotations

I have lost my life attempting to teach… Nobody can teach. Life alone and the Great Masters of the Past can do it. Nothing can replace the *instinct* and the *natural gift*…
Ernest Bloch

A big book is a big nuisance.
Callimachus

"I had," said he, "come to an entirely erroneous conclusion, which shows, my dear Watson, how dangerous it always is to reason from insufficient data."
Arthur Conan Doyle
(The Adventure of the Speckled Band)

Graduating Seniors

Back Row: Jeremy Niewman, Greg Dufore, Nick Germain, Sam Thieme, Chris Steinkirchner, Bill Orr, Jim Urick, Gillian Galle
Front Row: Justin Turk, Heather Brazeau, Matt Ford, Kevin Gonzales, Ben Lewis

Departmental Scholarships Awarded

The John Wiley Jones Award for Outstanding Students in Science has been awarded to **Kevin Gonzales**. The award recognizes one student from each department in the College of Science for his or her academic achievement and service to the department.

The Patrick Thomas Lynch Memorial Scholarship has been awarded to **Matthew Di Cesare** and **Nathan Reff**. This is awarded to incoming freshman or transfer students who show evidence of academic achievement and school or community activity.
The Dr. John F. Randolph Scholarship Award is given to a 2nd or 3rd year students that has maintained a high GPA and has funded his or her education through a variety of working positions. This year's recipient is **Devin Koestler**.

2004 Putnam Mathematical Competition

The sixty-fifth annual Putnam competition, a six hour exam administered at colleges and universities throughout the country on Saturday, December 4, 2004, recently released the results of the exam.

This year, RIT had a larger contingent of students take the exam than in previous years. A total of sixteen students from five departments at RIT participated. The ten Applied Math students were **Kevin Gonzales**, **Josh Joseph**, **Anurag Katyal**, **Devin Koestler**, **Victor Kostyuk**, **David Mittiga**, **William Orr**, **Nathan Reff**, **Sam Thieme** and **James Urick**. Two Physics students, **Kenneth Desmond** and **Robert Heslin**, two Computer Science students, **John Chatham** and **William Hoyt**, also participated, as did **Elizabeth Dombrowski** from Electrical Engineering and **Albert Snell** from Film. The Putnam Coordinator is **Prof. Jim Marengo**.

The highest individual scores for RIT on the exam were attained by James Urick and Kevin Gonzales. James and Kevin scored, respectively, 28 and 22 out of a possible 120 points. Those are very good considering the median was 1 out of 120. James and Kevin ranked, respectively, in the 89th and 87th percentile. Our team, consisting of James, Kevin, and Victor Kostyuk, scored 56th out of 411 teams, placing them in the 86th percentile among all teams.

So how difficult were these problems? Of the twelve problems in the exam, the "easiest" problem (the one that students scored more points on) was the following:

Problem A3: Define a sequence $\{u_n\}_{n=0}^{\infty}$ by $u_0 = u_1 = u_2 = 1$, and thereafter by the condition that

$$\det\begin{pmatrix} u_n & u_{n+1} \\ u_{n+2} & u_{n+3} \end{pmatrix} = n!$$

for all n greater than or equal to 0. Show that u_n is an integer for all n. (By convention 0!=1.)

The solution will be posted later this year in an issue of the *American Mathematical Monthly*.

2005 Monroe County Math League Meet

More than 550 area high school students converged at the RIT campus on March 3rd to participate in the Monroe County Math League All-Star Competition. Students and faculty alike enjoyed the day-long competitive meet that was hosted by the Department of Mathematics and Statistics for the fourth year in a row.

Ingle Auditorium was filled with junior mathematicians during the opening ceremony. **Prof. Matt Coppenbarger** welcomed the students on behalf of our department and involved 25 eager participants in a human demonstration of "Square Maneuvers," where the volunteers were challenged to solve a problem about maneuvering themselves on a square grid without knocking anyone over. After Dr. Coppenbarger's demonstration and the group's opening festivities, students eagerly searched for their assigned rooms across campus where they spent the morning in mathematical competitions with one another. During the afternoon, students formed teams and continued their calculations. With each problem, the field of competitors narrowed, leaving only the best teams to advance to the state mathematical meet.

The department enjoys inviting this group to campus during the otherwise quiet Spring Break. For several of the participants, the event helps them to learn what our campus is like, giving them a glimpse of where they could be in another year or two as RIT students.

The Mathematics and Statistics Fund of Rochester

The Mathematics and Statistics Fund of Rochester (MSFR) annually awards five to ten $2000 scholarships to freshmen entering one of the programs of the Mathematics and Statistics Department. The fund, established in 2003 by **George T. Georgantas**, **Richard J. Orr** and **Harry M. Schey**, awards scholarships on the basis of need and academic achievement as measured by high school averages and SAT scores. This year, eight of our freshmen hold MSFR scholarships. Funds in support of these scholarships are provided by donations from faculty and alumni. Contributions are tax deductible. For further information write to the Mathematics and Statistics Fund of Rochester, P.O. Box 92246, Rochester, NY 14692-0296.

(Continued from page 1)

for publication by the Journal Topology and Its Applications. The topic of the paper is using knot theory to understand solutions to differential equations. He also had an NSF CLLI grant for $75,000 approved for funding. Prof. Basener is the principle investigator on the grant with George Thurston of the Department of Physics as the co-pi. The grant will provide funding for research activities in applied topology culminating in the development of a textbook.

Darren Narayan, assistant professor in the Department of Mathematics and Statistics, gave a presentation entitled "Minimal Rankings for Directed Graphs" at the Thirty-Sixth Southeastern International Conference in Combinatorics, Graph Theory, and Computing held in Boca Raton, FL March 7-11, 2005.

Problem Corner: *Hi-Ho! Cherry-O*

This problem was communicated to us by one of the department's faculty member's nine-year old son, who wondered how long this game will last. It is deceptively simple, but not at all trivial.

Hi-Ho! Cherry-O is a game by Parker Brothers and is intended for two to four players in the age range of three to six years (but we'll ignore that last part). Initially, each player starts with ten cherries on the tree and an empty bucket. The goal of the player is to remove all ten cherries from the tree and place them in their bucket. Players alternate in spinning an arrow that indicates how the cherries are removed or added to the tree. There are seven equally likely possibilities:

The Numbers "*One*" through "*Four*": Take that many cherries from the tree and put them in your bucket.

"*Dog*" or "*Bird*": If your bucket contains two or more cherries, remove two cherries and put them back on the tree. If your bucket contains one cherry, put it back on the tree. If you bucket doesn't contain any cherries, do nothing.

"*Spilled Bucket*": Take all the cherries in your bucket (if any) and place them back on the tree.

The game could be over very quickly (with a minimum of 3 spins) or might take a 10 or 20 spins (or more!).

Main Question: What is the expected number of spins that a player will make in order to complete the game?

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Photography by David Crystal