department of
Mathematics & Statistics
newsletter

V. 20, No. 2, Aug. 2006

Congratulations to the Graduates of 2006!

Computational Mathematics

Khaled A. Abukhidejeh
Theodore J. Dziuba
John Anthony Feustel
Matthew Donald Ford
Benjamin Francis Foster
Andrew L. Goldman
Matthew John Koch
David Michael Mittiga
James Vincent Porter
Mark J. M. Schindlbeck
John Carver Vining III

Applied Statistics

Heather Marie Brazeau
Alexandria Kate Cherry
Andrew E. Cheshire
Sheena Marie Glenn
Alethia Jimenez Garcia
Sharuhaseny Mahenthiran
Bridget Maire Maloney
Paul Raymond Martino
Jeffrey L. Swanson
Heather Ann Wheater

GRADUATE DEGREES in Applied Mathematics

Amir Barghi
Mark R. Bellavia
Matthew Donald Ford
Mark J. M. Schindlbeck
Michael Daniel Short

Applied Mathematics

Ali Talib Miran Al-Raisi
Rachell Shuntay Ashley
Julia Rose Bethel
Julie C. Blackwood
Ryan Michael Fuller
Aaron Ethan Gabriel
Joshua Mason Joseph
Pooja R. Kosunam
Joshuah Shane Latimore
Tatiana Litvinenko
Kenneth McClune
Douglas Robert Moyer
Caitlin O'Donnell
Margaret L. Pokorny
Nathan Harold Reff
Halyna Romanyuk
Michael Daniel Short
Shelley Kaye Speiss
Geoffrey Eugene Watson
Debra Marie Wilper
Brian J. Witkowski

Outstanding Undergraduate Scholars

Julia Bethel is a student majoring in applied mathematics. She has conducted research with **Dr. Patricia Clark** from the Department of Mathematics and Statistics that modeled meningitis epidemics that occurred in six African countries in 2001 to determine how many individuals need to be vaccinated to avoid future epidemics. She has acquired an internship with the Archimedes Group (a consulting group associated with Kaiser Permanente) and is working on a mathematical model to predict the risk of Cardiac Artery Disease due to "bad" cholesterol. Additionally, Julia serves as the Honors Advocate for the RIT Leadership Institute and is also president of Pi RIT (a student chapter of the Society of Industrial and Applied Mathematics). Julia is a National Goldwater Scholar, recipient of the John D. Paliouras Award for Outstanding Academic Excellence, an RIT EMC2 Scholar, an RIT Presidential Scholar, and a member of the RIT Honors Program. Upon graduating, Julia hopes to work in a research team; modeling biological processes, specifically human health, with mathematics.

Heather Brazeau is a student majoring in statistics. She has worked full time at the Xerox Corporation in downtown Rochester as a business analyst developing confidence intervals to illustrate any weaknesses in the current business strategy and increase customer satisfaction. Heather has also performed research on campus with **Dr. Patricia Clark** from the Department of Mathematics and Statistics using differential equations to illustrate the spread of chlamydia in the United States over the past 13 years in hopes to predict the future distribution of the disease. Additionally, she has been a Resident Advisor and an Orientation Assistant for incoming students and their parents. The program that Heather is most proud of is organizing a poker tournament to raise money for Breast Cancer Research. Heather is an RIT Presidential Scholar, a Nathaniel Rochester Scholar, and in the RIT Honors Program.

2006 Graduates' Parting Shots

FOCUS ON THE DEPARTMENT: Undergraduate Research

Mathematics and Statistics students **Rachell Ashley** and **Carol Callesano**, along with RIT students **Aisosa Ayela** and **Frances Cabrera**, presented their investigations this past academic year as members of RIT's undergraduate researchers. They were among several undergraduates whose work was recognized by winning the undergraduate poster session at the Mathematical Association of America (MAA) Joint Mathematics Meeting in San Antonio, Texas in January 2006.

This accomplishment was recognized on the cover of a recent issue of FOCUS magazine. FOCUS is the news magazine of the MAA and has a worldwide circulation of about 30,000. It contains information about MAA activities, news about mathematics and the mathematical community, and lively articles about interesting new (or sometimes not so new) ideas in mathematics, mathematics education, and related areas. It is published nine times a year and is received by all members of the MAA.
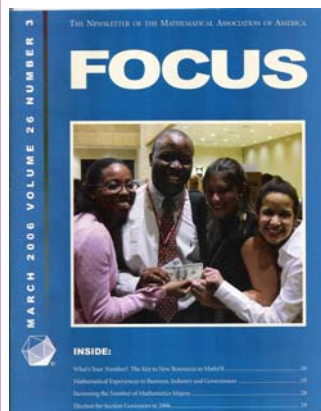

The team addressed a problem posed in the 1991 Putnam Exam that asked: Is it true that if the dimensions of an *m* x *n* rectangle are large enough that any rectangle can be tiled? The criteria for tiled are, first, no overlapping is allowed, and secondly, no space between adjacent tiles is allowed.

The bounds of this problem had been solved, but not as efficiently as desired. **Dr. Darren Narayan**, who is guiding undergraduate research in the department, had previously worked on proving the lowest bounds. The team considered every possible case below the bounds and solved the tiling problem using pinwheel methods, as well as coloring arguments. Their results have applications in printing, freight shipping, and hardware design.

The team also presented at the MCCC Conference at RIT in October 2005. Their work was funded through a grant from the National Science Foundation, SNA, MAA, and the Moody's Foundations.
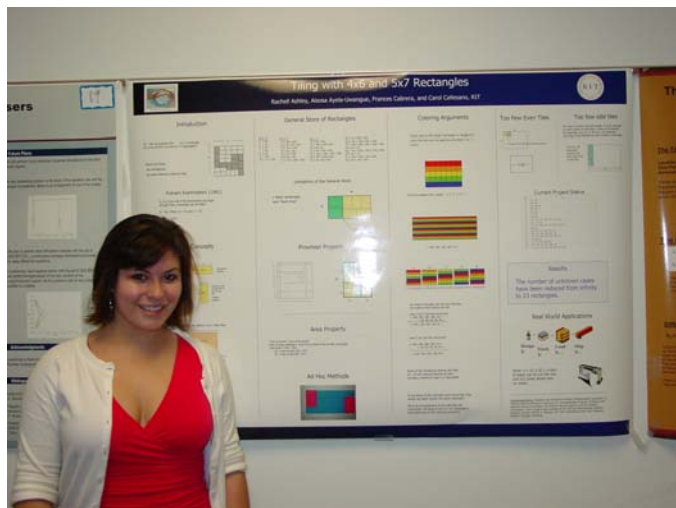
Carol Callesano shows the winning poster "Tiling with 4x6 and 5x7 Rectangles."
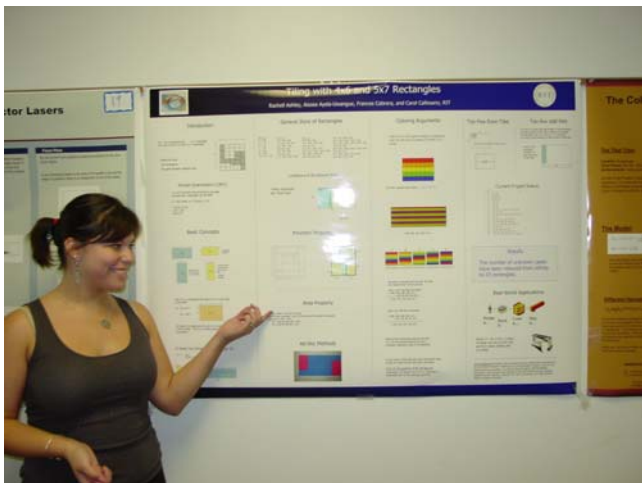
Departmental Scholarships and Awards

At the annual department awards ceremony, among the students that were recognized this year were the following notable awards:

2006 John D. Paliouras Award for Outstanding Academic Excellence recipient is **Devin Koestler**. 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.

The John Wiley Jones Award for Outstanding Students in Science has been awarded to **Shelley Speiss**. 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 **Derek Litwin** and **Melanie Naumenko**. 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 **Melanie Naumenko**.

The Ihor Shot Scholarship is awarded to **Halyna Romanyuk** and **Daniel Zitnik**. It is awarded to students with Ukrainian heritage who demonstrate financial need.

Faculty News

Congratulations to **Drs. Carl Lutzer, Darren Narayan,** and **Hossein Shahmohamad** for their being awarded tenure and promotions to Associate Professor!

Dennis Glanton, Mathematics/Statistics Department Lecturer, gave presentations on February 9 to the high school staff and on February 16 to the middle school staff in the Rush Henrietta Central School District. The presentations were on the integration of the software packages MathType and Microsoft Word in the PC environment. Both staffs have recently received IBM laptop computers for educational use but were unfamiliar with the use of MathType or the integration of MathType with Microsoft Word in developing tests, quizzes and worksheets. The presentations demonstrated the seamless use of the two software packages.

Mathematics and statistics assistant professor **Dr. Bernard Brooks** presented "Rumour Propagation on a Small World Network" at the MAA Seaway Section's Spring Meeting, Ithaca College, April 29, 2006. He also had the following articles published: *"Brouwer Fixed Point Theorem Applied to Rumour Transmission"* (with Drs. William Basener and David Ross), in Applied Mathematics Letters , Vol. 19/8 and *"The Coefficients of the Characteristic Polynomial in terms of the Eigenvalues and the Elements of an n×n Matrix,"* in Applied Mathematics Letters, Vol. 19/6.

Assistant professor **Dr. Raluca Felea**, mathematics and statistics, gave a talk: "An FIO calculus for the marine seismic imaging" at the 9th New Mexico Analysis Seminar on April 6-8. She also presented a poster to the 'Women in Mathematics: the legacy of Lady Zhenskaya and Oleinik' workshop at MSRI, Berkeley in May.

Mathematics and statistics assistant professor **Dr. Joel Zablow** presented the talk "On Relations and Homology in the Dehn Twist Quandle of a Surface" at two seminars; the Departmental Seminar, Bronx Community College, CUNY

Faculty News, con't.

Mar. 7 and the Topology Seminar, Graduate Center CUNY Mar. 8.

Assistant professor **Dr. Anurag Agarwal**, mathematics and statistics, gave a research presentation at the Seaway Section Meeting of the Mathematical Association of America, which was held in Ithaca College, Ithaca on April 28 & 29 2006. Dr. Agarwal's presentation "On Thue-Mahler Quartic Diophantine Impossibilities" focused on the study of number-theoretic methods for finding solutions of a family of degree four Diophantine equations.

Assistant professor **Dr. Yolande Tra** reviewed a third edition of Introduction to Statistics and Data Analysis by Peck/Olsen/Devore's for Duxbury - Brooks/Cole of Thomson Higher Education publishing company during April 2006. She also reviewed the book Even You Can Learn Statistics: a Guide for Everyone Who Has Ever Been Afraid of Statistics by David M. Levine and David Stephan during May 2006, for JASA (Journal of The American Statistical Association) / TAS (The American Statistician) Reviews of Books and Teaching Materials.

Assistant professor **Dr. Hossein Shahmohamad**'s manuscript titled *"Some Coefficients of the Flow Ploynomial of K_n"* was submitted, accepted and will appear in volume 58 August 2006 of JCMCC (the Journal of Combinatorial Mathematics and Combinatorial Computing). He also submitted the manuscript *"Revisiting Chromatic Polynomials of Some Sequences of Graphs"* (with co-author Amir Barghi) to Ars. Combinatoria, 2006, the manuscript *"On Partial Chromatic Ordinomials"* to Journal of Algebraic Combinatorics, 2006, and the manuscript *"Chromatic Polynomial of C_4 times P_n and C_5 times P_n"* to Discrete Mathematics, 2006. Additionally, Dr. Shahmohamad attended and presented "Julius Petersen: The Graph and the Man Behind It" at the PA-SSHE-MA Pennsylvania State System of

Faculty News, con't.

Higher Education Mathematics 2006 Annual Conference on March 31-April 1, 2006 at Edinboro University in Edinboro, PA; attended and presented "Chromaticity: Equivalence, Roots \& Uniqueness" at the Department of Mathematics Colloquium series on April 14, 2006 at Indiana University of Pennsylvania in Indiana, PA.; attended and presented "Matching, Flow and Chromatic Polynomial in Graph Theory" at the Seaway Section of MAA on April 28-29, 2006 at Ithaca College in Ithaca, NY; reviewed the 3rd edition of the textbook Introduction to Graph Theory by Douglas West published by Prentice Hall, 2006; and reviewed the 1st edition of the textbook Calculus by Jonathan D. Rogawski published by W.H.Freeman/Worth Publishers, 2006.

Graduation with Distinction in Mathematics or Statistics

At commencement exercises this year, the department presented the first class of students graduating with title of "Distinction in Mathematics or Statistics." Requirements for consideration for the departmental award are (1) a 3.6 or higher (on a 4.0 scale) Primary Field of Study Grade Point Average (that is, just the math and/or stat classes) upon completion of the degree, (2) have engaged in faculty supervised research, and (3) have presented superior research in a formal setting at the department level or higher.

The inaugural awardees of Graduation with Distinction in Mathematics or Statistics were Julia Bethel, Julie Blackwood, Heather Brazeau, David Mittiga, Nathan Reff, and Shelley Speiss.

2005 Putnam Mathematical Competition

The sixty-sixth annual Putnam Competition, a six hour exam administered at colleges and universities throughout the country on Saturday, December 3, 2005, 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 Math students were Ali Al-Raisi, Julie Blackwood, Ryan Fuller, Joshua Joseph, Tony Lee, Yi-Hsian Lin, David Mittiga, Richard Moreton, Dan Pike, and Nathan Reff. Additionally, Elizabeth Dombrowski from Electrical Engineering and Chris Connett from Computer Science also participated in the competition. The Putnam Coordinator is **Prof. Jim Marengo**.

The highest individual scores for RIT on the exam were attained by Ali Al-Raisi and David Mittiga. Ali and David scored, respectively, 10 and 9 out of a possible 120 points. Those are good considering the median was 1 out of 120. Ali and David ranked, respectively, in the 70th and 64th percentile. Our team, consisting of Ali Al-Raisi, Elizabeth Dombrowski and Nathan Reff, scored 119th out of 395 teams, placing them in the 70th 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 B1: Find a nonzero polynomial $P(x,y)$ such that $P(\lfloor x \rfloor, \lfloor 2a \rfloor)=0$ for all real numbers a. (Note: $\lfloor x \rfloor$ is the greatest integer less than or equal to x.)

The solutions have been published this year in an issue of the *American Mathematical Monthly*.