

A TRIBUTE TO DR. GEORGE T. GEORGANTAS

The Department of Mathematics and Statistics was saddened by the loss of Dr. George T. Georgantas on February 8, 2004. Prof. Georgantas was a valuable colleague, an excellent teacher and a good friend.

The son of Greek immigrants, Prof. Georgantas was born in Olean, New York. After graduating from high school in Olean, he attended Cornell University before transferring to the University of Rochester, where he received his B.A. degree. He received his M.A. degree from Washington University in St. Louis and his Ph.D. from the University of Buffalo. All of his degrees were in mathematics.

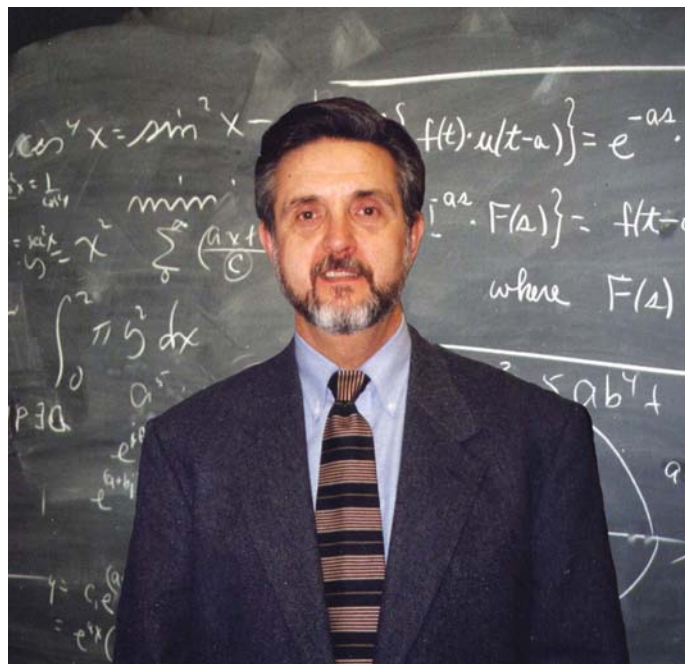
Prof. Georgantas taught at Buffalo State College before joining the RIT faculty in 1975 as a visiting assistant professor. He rose rapidly through the academic ranks to become department head in 1980. Under his leadership, and assisted by a surge in institutional growth, the department grew in every respect, especially in its reputation for professionalism and excellence in teaching. The number of majors in the department nearly doubled, and, in addition to the program in Applied Mathematics, the Computational Mathematics and Applied Statistics programs as well a master's degree program in Industrial and Applied Mathematics were initiated.

Prof. Georgantas held the position of department head for 15 years and returned to full-time teaching in 1995. In 2001, he was rewarded for his dedicated teaching efforts and his love of his students with the very prestigious *Eisenhart Award for Outstanding Teaching*. This is the highest honor that can be bestowed upon a faculty member at RIT.

Prof. Georgantas was at the forefront of RIT's distance learning courses in mathematics. "You never get to see your students," he said, "but you find ways to make the class as personable as you can." He encouraged students to scan pictures of themselves and their families to share with the entire class over the internet and he maintained daily communication with all of his students. Whether Prof. Georgantas was at the front of the room or hundreds of miles away, his dedicated efforts won the respect and appreciation of his students, who affectionately called him G².

Prof. Georgantas was a tireless worker in the Greek Orthodox Church, where he conducted the choir, helped to create a second Greek Orthodox Church in the Rochester area, organized the Orthodox Campus Fellowship, and assisted in a myriad of tasks. He organized fellowship functions, taught Greek dancing, assisted with the Greek school, and even painted rooms when renovations were necessary. For his steady and persistent labors in the musical life and culture of at least three Greek Orthodox parishes during his lifetime, in 2003 Prof. Georgantas was awarded the highest honor bestowed upon a member of the Diocese of Detroit: *The Patriarch Athenagoras I Medal for Diocesan Service in the Music Ministry*.

Prof. Georgantas will be missed not only by his wife Irene, his daughter Lea, and his sister Ana, but also by the legion of students, the Greek community, and his many colleagues and friends at RIT whose lives he touched.



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UNDERGRADUATE RESEARCH AT RIT

Two years ago the Department of Mathematics and Statistics launched its Undergraduate Research Initiative, where students can work together with faculty on innovative and exciting research projects. Since then, we are proud to have had 13 presentations by students at national conferences and 10 students are writing research papers intended for publication in research journals.

“The response from the students has been terrific” says program director Professor Darren Narayan, “I am continually amazed at how much they can grasp and how well they can think on their feet.”

The generous contributions from JetBlue Airways and RIT Alumni Kay Carlisi, Tony Carlisi, and Thomas Militello have brought this program to new heights. This program gives students the opportunity to not only obtain valuable research experience but also to gain exposure at the national level. Students that have presented their research have returned from conferences with more confidence, more energy, and better prepared for life beyond RIT.

Victoria Shults, an Applied Mathematics major graduating this year, participated in undergraduate research during her junior year. “Presenting our research before some of the best and brightest in the field was an incredible experience for me. To have one of the top researchers in the field express to us how difficult the problem we solved truly was is extremely rewarding. I firmly believe that this experience was one of the greatest of my college career and am very fortunate to have had this opportunity.”

This year we have several mathematics and statistics majors that have been working with faculty. They include:

- Ali Al-Raisi, an Applied Mathematics major, is working with Professor David Ross on geometric problems arising in mechanical engineering.
- Greg Dufore, an Applied Statistics major, is collaborating with Professor Darren Narayan using methods from operations research to determine optimal player rankings for tournaments.
- Ted Dziuba, an Applied Mathematics major, is also working jointly with Professor David Ross on a project on problems involving partial differential equations and fluid dynamics supported by Eastman Kodak Company .
- Josh Joseph, an Applied Mathematics major, worked with Professor Carl Lutzer on harmonic functions and the tempering of sounds.
- Jim Urick, an Applied Mathematics major, is currently working with Professor Darren Narayan on a problem that is in the area of graph theory and combinatorial number theory.

After the students present their research at a conference, they return more confident, more focused, and eager to learn. It is amazing the difference that this program makes in the lives of our students.

We are continuously looking to include more students and faculty in this exciting program. In the future, the department would like to see the program expand to include 20 or more students every year, with 10 or more students traveling to conferences to present their work.

OUTSTANDING UNDERGRADUATE SCHOLARS

Victor Kostyuk is a major in computational mathematics. He is the recipient of the RIT Presidential Scholarship, the RIT Alumni Scholarship and the Nathaniel Rochester Society Scholarship. He joined a research collaboration on graph rankings with Victoria Shults and Dr. Darren Narayan of the Department of Mathematics and Statistics. Their paper, *Minimal Rankings and the Arank Number of a Path*, was presented at the 34th Southeastern International Conference on Combinatorics, Graph Theory, and Computing held in Boca Raton, FL in 2003 and will be published in the journal *Discrete Mathematics*. Last summer, he worked for a National Science Foundation Research Experience for Undergraduates Program on graph theoretical algorithms held at Rutgers University. Last fall, he also spent a semester in Budapest, taking advanced mathematics courses at the Hungarian Academy of Sciences. Victor plans to enroll in a Ph.D. program in mathematics next fall.

Victoria Shults is a major in applied mathematics. She is the recipient of the Dr. John F. Randolph Scholarship, the RIT Department of Mathematics and Statistics Scholarship, the RIT Presidential Scholarship, and the Nathaniel Rochester Society Scholarship, to name a few. She joined a research collaboration on graph rankings with Victor Kostyuk and Dr. Darren Narayan of the Department of Mathematics and Statistics. Ms. Shults has worked as a math tutor in the Learning Development Center for more than two years. She has interned at a small actuarial firm in Rochester and at Cognigen Corporation in research and data analysis of pharmaceuticals. She has been an active member in the Golden Key International Honor Society, the Pi Mu Epsilon National Honor Society, and the Delta Lambda chapter of Alpha Xi Delta fraternity. Ms. Shults graduated in February and is currently working as a mathematician with the National Security Agency in Fort Meade, MD.



UNDERGRADUATE RESEARCH

Several students in the Department of Mathematics and Statistics have been engaged in various levels of undergraduate research. Seven of these students participated in NSF sponsored summer undergraduate research programs (REUs) during the summer of 2003. A few of the students, who are still at RIT, volunteered to share their experiences.

Tiffany Swasta, an Applied Statistics major, attended the Ohio State REU program and felt that it was a great experience for her as an undergraduate student. The program was eight weeks long and paired each student with a statistics faculty mentor as well as a faculty mentor from another department, dependent on the subject matter of the research. The REU program was excellent because it gave her the opportunity to put her statistical and analytical skills to use in order to understand the results of a seven year study conducted by her faculty mentors. In her research, she utilized several different regression techniques and was able to expand her knowledge of interpreting graphical and numerical results.

Tiffany's final presentation was titled "Prediction of Calcium Needs for Bone Mass Growth Among Young Females." In her presentation, she discussed osteoporosis and how calcium intake affects peak bone mass of women. The final results of her research included basic methods of predicting whether young females will need a calcium supplement in order to increase peak bone mass and possibly prevent osteoporosis later in life.

Greg Dufore, an Applied Statistics major, began his research work at RIT under Prof. Darren Narayan along with two other RIT undergraduates, Jennifer Baldwin and Bill Kronholm, both of whom graduated last year. His REU was based at RIT in the field of Graph Theory. Being in the Honors Program and working with Prof. Narayan provided Greg with the opportunity to expand what he had learned about in class into an area that had previously never been explored. The chance to do something new in mathematics was the most attractive part of the REU.

The group began with the problem of ranking players who are tied in a round robin tournament. If these players are ranked incorrectly with respect to one another, they complain. A complaint occurs when player A is ranked below player B, but player B beats player A during the tournament. The problem dealt with was "Is there a way to know if a ranking with x players complaining is optimal?" That is to say, is there a way to know if a tournament of n players with x players complaining can be rearranged so there are fewer complaints. Using digraphs and an integer linear program, the group modeled the problem and was able to obtain results for approximately 70 cases. Using these cases, they expanded Bill and Jen's work to create a new generalized result. They also discovered a new method of creating solutions to this problem.

As a direct result of Greg's REU, he had the opportunity to speak at two professional conferences, the Big Sky Conference on Discrete Mathematics at the University of Montana and the 35th Southeastern International Conference on Combinatorics, Graph Theory, and Computing at Florida Atlantic University. He felt that both experiences were as useful as a co-op job. The conferences were great because he saw what other professionals were doing in his field of interest. Also, he was able to interact with many of the people there, which gave him an idea of what a career in research/teaching mathematics would be like. These are experiences which Greg recommends to any undergraduate who has the opportunity to participate.

James Urick, an Applied Mathematics major, participated in an REU in evolutionary game theory at the University of Illinois. A majority of the time covered introductory topics and he was able to travel, meet new people, and get paid for it. He also had a chance to

learn about related subjects that he thought were interesting such as stochastic processes.

Jim has also conducted research in graph theory here at RIT under the direction of Prof. Narayan. Graph theory is a nice subject for undergraduate research because some areas do not require as extensive backgrounds as many other subjects do. Another attractive feature was the opportunity to attend the annual Southeastern International Conference on Combinatorics, Graph Theory, and Computing in Florida. Jim made a presentation on the representation numbers of split graphs at the Conference. A split graph is a union of a complete graph and a set of independent vertices, a representation of a graph modulo n is a labeling where each of the vertices have distinct labels and two vertices are adjacent if, and only if, the difference between their labels is relatively prime to n . The representation number of a graph G is the smallest n such that G is representable modulo n .

Joseph Rhoads, an Applied Mathematics major and now a graduate student in the Industrial and Applied Mathematics program, attended the REUs program at California State University. The areas of research were Knot Theory and Graph Theory. His description of the program is, in one word, AMAZING.

In more than one word, Joe felt that the experience was a nine to five job, much like many other summer jobs. The rewards were great, and participants were paid to do mathematics in California. During the first two weeks of the REU, the leaders presented an overview of both subject areas. In the mornings, they would do a session in knot theory and the afternoons they did a session in graph theory. The overview included having the participants review and present current articles in the field to the rest of the group. It was also during this time that they learned to use MAPLE and to write in LaTeX.

After those first two weeks, several open problems were presented in each field and the participants were able to choose an area in which to work and a problem to tackle. Joe chose to work in knot theory and his research centered on writing a series of applications in MAPLE that culminated in a package for working with polygonal knots (knots made out of sticks). At the end of the REU, the participants each used LaTeX to write a paper or report on their research. They each gave an oral presentation on their research that



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FUTURE PLANS OF STUDENTS GRADUATING FROM THE DEPARTMENT

Neil Brenner (SMAS): “I am going to be staying at RIT to get my MBA after I graduate. Other than that, I’m not really sure about my work plans.”

Tonya Campbell (SMAM): “I plan on continuing my education here at RIT. I plan on doing the MBA program, hopefully in Finance. I will be starting the program this summer and finishing it in about 5 quarters.”

Shana Dagel (SMAM): “I’ve been taking some packaging science classes along the way and feel that with my strong math background, I can bring useful skills to the packaging industry. Therefore, I will be back at RIT in the fall to complete my Master’s degree in Packaging Science.”

Calvin Farmer (SMAM): “I took a job with a company called NavAir. They are located in Patuxent River, Maryland, and they make weapons for the Navy. I was hired as an Operations Research Analyst for the logistics division.”

Stephanie Maksymiw (SMAC): “Since I left RIT at the end of 2003, I have a job as an Administrative Assistant/QA Assistant at Tessy Plastics in Elbridge, NY. For half the day I do normal administrative duties and the other half is spent helping out one of the quality engineers. In the near future, I am hoping to get a position as a Programmer either here, which seems quite possible, or elsewhere. And if that doesn’t happen, plan B is to become a world famous novelist....just kidding :)”

Thomas Prevendoski (SMAM): “I am currently planning on entering the masters program at the University of Arizona in the field of Operations Research. Within four years, I hope to get my Ph.D. in the same field. With my graduate degree, I would like to acquire a position as an Industrial Engineer. But I have also warned Sophia that I intend to return to RIT at that time and ask for a teaching position.”

(Continued on page 5)

WINTER DEAN’S LIST

| | |
|------------------|---------------------|
| Julia Bethel* | Alana Kulba |
| Julie Blackwood | Bryan Lenker* |
| Joni Borrelli* | Benjamin Lewis |
| Heather Brazeau* | Matthew McEvoy |
| Neil Brenner | Elizabeth Meyer |
| Carol Callesano | Kari Miller |
| Tonya Campbell* | Caitlin O’Donnell |
| Patrick Curran | Margaret Pokorny |
| Michael Curry | James Porter |
| Shana Dagel | Charles Schillberg |
| Michael Denning | Martin Setto |
| Calvin Farmer | Nicolas Shayko* |
| Rym Ferahtia | Victoria Shults* |
| John Feustel* | Shelley Speiss* |
| Matthew Ford | Chris Steinkirchner |
| Ryan Fuller | Abbie Stokes-Riner* |
| Nicolas Germain | Tiffany Swasta* |
| Kevin Gonzales* | John Szymanowski* |
| Lucas Habegger | John Vining III |
| Stephanie Jones* | Heather Wheeler* |
| Patrick Kelly | Hye Yon Yi* |

Congratulations to all!

* denotes 4.0 GPA

(Undergraduate Research Continued from page 3)

was open to the school and the community, and they each created a poster depicting their work and results. The session included 110 poster presentations from all over the nation. Joe’s project earned praise from the judges and he was awarded one of the 32 cash prizes.

In January 2004, seven of the eight participants in Joe’s REU submitted and were accepted to present their posters, along with posters from other REU’s, at the Joint AMS/MAA meeting in Phoenix, AZ. Through alumni provided funding, Joe was able to fly to Phoenix and present his poster at the session. Some of the people whose articles and books he had used in his research were the judges for the poster session. He thought it was incredible to meet them and an honor to be chosen as one of the poster session award recipients.

(Faculty News Continued from page 6)

ture, were the invited March speakers at the RIT “Meet the Authors” series hosted by Wallace Memorial Library. They discussed how they have negotiated the process of writing collaboratively for over twenty years.

Assistant professor **Bernard Brooks** published a paper entitled “Linear Stability Conditions for a First Order 3-Dimensional Discrete Dynamic” in the *Applied Mathematics Letters*, (2004) 17(4), 463-466.

Associate professor **David Ross** has been awarded tenure by RIT. It is effective beginning Fall Quarter 2004.

Professor and Head **Sophia Maggelakis** presented “Successful Initiatives in Calculus Education: Results of a Two Year Pilot” at the 15th International Conference on College Teaching and Learning that took place in Jacksonville, Florida during March, 2004.

STUDENT AWARDS & SCHOLARSHIPS

The 2004 John D. Paliouras Award for Outstanding Academic Excellence recipient is **Gregory Dufore**. The award was initiated in 2003 and is named in honor of our long-time colleague, faculty member and former COS dean John D. Paliouras. Greg is a 5th year SMAS major who has been involved with research activities. He recently presented some of his findings at the 35th International SE Conference on Combinatorics, Graph Theory and Computing and is anticipating publication in the near future.

The 2004 Dr. John F. Randolph Scholarship Award recipient is **Chris Steinkirchner**. This award recognizes a second year student who has demonstrated academic achievement, evidenced by GPA, and who works to support the funding of his or her education. Dr. Randolph (1904-1988) was a well known and prolific mathematician, and a much respected member of this department.

2004 MONROE COUNTY MATH LEAGUE MEET

More than 570 area high school students converged at the RIT campus on March 4th 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 third year in a row.

Ingle Auditorium was filled with junior mathematicians during the opening ceremony. Associate Professor David Ross welcomed the students on behalf of our department and talked to them about the challenges and excitement found in careers in mathematics and statistics. After Dr. Ross's welcome 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. Their excitement and enthusiasm for mathematics signal the soon-to-arrive Spring Quarter on campus. And for several of the participants, the event helps them to see what our campus is like, giving them a glimpse of where they could be in another year or two as an RIT student.

ACTIVITIES OF PI-RIT

(The Math/Stat Club of Undergraduate Students)

By Calvin Farmer

This Spring Quarter, PiRIT has five main goals. First, we would like to continue making the Friday math-clubs educational and more than just a social hour. We plan to continue using that hour to allow students and faculty to present their research. Second, we plan to bring in outside speakers. Third, we plan to continue tutoring in the Residence Halls on the third, sixth, ninth, and finals week of classes. Next, we plan on making PiRIT t-shirts. These shirts will be available to all faculty and the money will go to PiRIT's budget. Finally, we plan on becoming a student chapter of SIAM. This will allow us to get more funding and free memberships to SIAM for all PiRIT members.

(Future Plans of Students Continued from page 4)

Nick Schifferle (SMAM): "I plan on working for a year or two, not sure exactly in what or where though. I think that I will also be taking a few classes during that time, so I can learn more about either engineering or finance. After that, I will more than likely go to grad school in one of the two areas."

Victoria Shults (SMAM): "I graduated Winter Quarter this year. I am now living in Columbia, MD and am working as a mathematician for the Department of Defense. As for other big plans, I am getting married in August of 2004."

Tiffany Swasta (SMAS): "After graduation, I will be remaining at RIT to complete the joint BS/MS program in Applied Statistics. I expect to complete the joint program in May 2005. At that time, I would like to pursue career options in the Rochester area."

THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

The sixty-fourth annual competition was held on December 6, 2003. A total of 3,615 students representing 479 colleges and universities from Canada and the United States participated in the competition. RIT's team rank was 59th out of 401 teams. It placed our team in the 85th percentile. The team members were Victor Kostyuk, William Orr and James Urick. Other contestants and participants were Robert Heslin, Kenneth Desmond, and Joe Rhodes. Victor Kostyuk's score was 21/120, which placed him in 91st percentile. The winning team was from M.I.T.

The William Lowell Putnam Mathematical Competition is an annual contest for college students established in 1938 in memory of its namesake. Over the years, many of the winners of the Putnam competition have become distinguished mathematicians. A number of them have received the Fields Medal and several have won the Nobel Prize in Physics.

PROBLEM CORNER: Magic Square Tic-Tac-Toe (a game for two players)

This is a variant of the game “Tic-Tac-Toe” where the numbers are entered into the spaces instead of ‘X’s and ‘O’s. A Magic Square is a square array of numbers such that the sum of the numbers along the rows, columns, and main diagonals are equal.

On an initially empty 3 x 3 “Tic-Tac-Toe” array, players alternate entering numbers subject to the following:

Rule 1: Numbers entered into the array must be positive integers one through nine (and can be repeated).

Rule 2: When a number is entered that forms a complete column, row, or diagonal, the sum of those three numbers must be 15.

Rule 3: First player unable to place a number in the array loses.

A sample game: 3 in E, 7 in G, 5 in C, 9 in I, 1 in F, and 9 in B is the winning move. In this case, player 2 was the last to play and is, therefore, the winner.

Goal: Determine which player, Player 1 or Player 2, has a winning strategy and what is that strategy.

| | | |
|---|---|---|
| A | B | C |
| D | E | F |
| G | H | I |

A labeled “Tic-Tac-Toe” board.

FACULTY NEWS

On February 25, associate professor **David Ross** visited Alfred University, where he gave a talk entitled “Dynamical System Models of a Micro-Energy Harvester.” On March 1 and 2, Professor Ross visited Bethel College in North Newton, Kansas, where he gave the same talk, as well as a talk on Mathematics in Photographic Science.

Assistant professor **Bill Basener** accepted a contract with John Wiley Publishing to publish a textbook entitled Topology and Its Applications. The book is scheduled to appear in print in July 2006.

Assistant professor **Bill Basener** gave a talk entitled “Transverse Disks, the Gottschalk Conjecture, and Thurston Nielson Theory” at the University of Rochester Topology seminar on January 23.

Professors **Bill Basener and David Ross** had a co-authored paper entitled “Booming and Crashing Populations and Easter Island” accepted to the SIAM Journal of Applied Math.

Department Head and professor **Sophia Maggelakis** published a paper entitled “Modeling the Role of Angiogenesis in Epidermal Wound Healing” in the Discrete and Continuous Dynamical Systems- Series B Journal, Volume 4, Number 1, February 2004.

Professor **James Halavin** compiled and reported the “Statistical Analysis of Representation of African-Americans in Superior Court Criminal Trials” for the Monroe County Office of the Public Defender.

Assistant professor **Michael Radin** refereed a paper that may be published in an upcoming issue of Nonlinear Dynamics, Psychology and Life Sciences.

Assistant professors **Dr. Tamara Burton and Dr. Darren Narayan** gave research presentations at the American Mathematical Society Session on Graph Theory held during the national Joint Mathematics Meetings in Phoenix, AZ, in January. Dr. Burton’s presentation “Domination i -Dot Critical Graphs” focused on col-

laborative research with alumna **Melissa Matthews** (‘03). Dr. Narayan’s presentation “Ordered Colorings of Graphs” was a result of a joint research project with applied mathematics major **Victor Kostyuk**.

Assistant professors **Dr. Tamara Burton, Dr. Carl Lutzer, and Dr. Darren Narayan** were organizers of the AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates held at the 2004 Joint Mathematics Meetings in Phoenix, AZ.

Dr. Darren Narayan co-authored the article “Complete Classification of All Tournaments with a Disjoint Union of Directed Paths as Feedback Arc Set” with Dr. Garth Isaak of Lehigh University. Their 20 page article is in the January 2004 Issue of the Journal of Graph Theory, published by John Wiley Inter-science.

Lecturer **Carol Oehlbeck** attended the COMAP TeachMap Workshop B in Phoenix, Arizona on January 5th and 6th. The workshop illustrated activities and investigations to introduce topics appropriate for developmental mathematics students to explore authentic real-world applications. Information from the workshop will be incorporated in Prof. Oehlbeck’s discrete mathematics classes. Prof. Oehlbeck also attended the Joint Meeting of MAA and AMS during the first week of January.

Associate professor **James Marengo** presented “Extremal Types Theorem” at the Seaway Section Meeting of the Mathematical Association of America, which was held on campus on November 8, 2003.

Assistant professor **Hossein Shahmohamad**’s manuscript entitled “Flow equivalent $K_{3,3}$ and K_5 amallamorphs” appeared in the Bulletin of Institute of Combinatorics and Applications Volume 40, 2004, pages 59-66.

Professors **Marcia Birken**, Department of Mathematics and Statistics, and Anne C. Coon, Department of Language and Litera-

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