*Las*MATRICES

VALDOSTA STATE UNIVERSITY

A WORD FROM OUR CHAIR

Greetings to friends and alumni of the Mathematics & Computer Science Department at Valdosta State University. 2014 was an exciting year for the Mathematics and Computer Science Department. We welcomed a new faculty member, Dr. Paul Mihail, to our computer science program as well as a new lab manager, Mr. Matt Cliatt. In addition, we celebrated the accomplishments of Drs. Chunlei Liu and Arsalan Wares, who were promoted to Professor, and Dr. Krishnendu Roy, who was promoted to Associate Professor.

Our students accomplished great things in 2014. During the spring, Erica Garcia, Jennifer Griffin, Daniel Drummond, Kyle Land, Daniel Lanning, and Andrew Wells presented their research at the VSU Undergraduate Research Symposium (URS). Also, Daniel Lanning and Joshua Neese published their research with Dr. Jin Wang in the 52nd ACM Southeast Conference Proceedings. During the fall, we sent a student team to compete in the ACM Southeast Regional Programming Contest at Georgia Tech. Also, Jacob Benoit and Nathanial Jones presented their research at the Southeastern Conference of the Institute for Operations Research and the Management Sciences (INFORMS) in Myrtle Beach, SC.

In addition to our constant pursuit of academic excellence in our undergraduate mathematics and computing programs, the department also reaches out to grade k-12 students and encourages them to pursue studies in science and mathematics through a variety of on-campus programs. During 2014, we hosted over 500 area k-12 students at six different outreach events.

During 2014, our faculty conducted research and published articles in peer-reviewed state, national, and international journals and proceedings. In addition, the faculty continuously seek to improve the undergraduate learning experience for students at VSU. During Fall 2014, the department piloted a five-day-a-week College Algebra course that has proven successful in helping our students move to the next math class.

During the fall, we honored our department's outstanding alumnus, Mr. Dan Griffin, who is profiled in this newsletter. We congratulate Mr. Griffin for his many and varied professional accomplishments.

2014 was also a year of great loss as we were saddened by the loss of one of our students, Elizabeth "Lizzie" Lohmar. Her parents, Mr. Peter and Ms. Margery Lohmar, established a scholarship in her memory that to date has $25,295 donated by over 100 friends and family.

Throughout 2014, the department developed strong partnerships to serve our students and region. For the first time, the university offered a guaranteed $1000 scholarship to the winner of our Sonia Kovalevsky Day math contest. Our corporate sponsor Nexxtep Technologies provided a $500 scholarship to our outstanding computer information systems major, while Azalea Health co-sponsored and awarded $1,750 in prize money for the Hackathon programming contest.

We greatly appreciate the people who donate to our department. As an indicator of our faculties' commitment to our institution, in 2014 the faculty contributed approximately 50% of the total amount donated to our department. As we strengthen our programs and our grade k-12 outreach, we also strengthen the value of our alumni's degrees, empower young minds, and enrich our community. We encourage you to consider partnering with us in 2015 as we strive to meet the needs of our region by donating to our Math/CS department fund at **www.valdosta.edu/administration/advancement.**

We would also enjoy hearing your ideas of how you can partner with us to meet the needs of our region. Further, we encourage our alumni to send in your alumni news to appear in our next newsletter. You can communicate with us at **mathcs@valdosta.edu.**

Have a Happy 2015!
Greg Harrell, *Ph.D., Professor & Department Head*
Mathematics & Computer Science

The 19ᵗʰ Annual **SONIA KOVALEVSKY DAY** & Camp Invention

The 19th annual Sonia Kovalevsky Day was held at Valdosta State University on Wednesday, April 23, 2014, from 8:30 a.m. to 2 p.m. in the Student Union. The Day was co-directed by Drs. Denise Reid and Sandy Trowell.

SK Day is a project that seeks to encourage high school women to pursue the study of mathematics and prepare for possible careers in mathematics related fields. The event is named in honor of Sonia Kovalevsky, a Russian mathematician and the first women to earn a doctorate in mathematics. According to co-directors, Dr. Denise Reid and Dr. Sandy Trowell, this year's SK Day was made possible by the support of the VSU Department of Mathematics and Computer Science, Publix, CBJ Industries, and the Leona S. Hudson Charitable Foundation,

Inc. Also contributing to the day were the VSU Bookstore, Texas Instruments, Cengage Learning, Pearson Learning, McGraw Hill Education, and Wiley Inc. The day included three workshops given by Dr. Peggy Moch, Ms. Janice Lowe, and Mr. Wing Lee. The workshop topics were Cryptography, Answering Life's Questions with Algebra, and Origami. Mrs. Alyssa Pate, a pharmacist at Chancy Drugs, was the career speaker for the event. The day also included a math contest and lunch at Palms Dining Center. Eighty-three high school students and teachers from 12 area high schools attended the event. Valdosta State University held its 3rd Camp Invention on June 9-13, 2014. There were 65 participants in the camp. Camp Invention is a STEM camp designed for students entering 1st - 6th grades. Dr. Denise Reid directed this camp.

COMPUTING ADVENTURES
@ VSU SUMMER CAMP

Dr. Krishnendu Roy has organized the Computing Adventures @ VSU summer camps in June and July of 2014. In these camps, elementary and middle school students were introduced to computing and programming in fun and engaging ways. They created animations and games using a programming language called Scratch. The campers built and programmed their own robots using the Lego Mindstorms robotics kits. They also created their own Android apps. We plan to offer similar camps in 2015. More details about the 2015 camps including dates and application information will be posted on the camp website, **http://cscamp.valdosta.edu** in February.

*Las*MATRICES

Departmental**NEWS**

- **Dr. Shaun V. Ault & Dr. Charles Kicey** recently published an article entitled *"Counting paths in corridors using circular Pascal arrays"* in the journal **Discrete Mathematics**. Dr. Ault also published the articles *"Bott periodicity in the Hit Problem"* in **Mathematical Proceedings of the Cambridge Philosophical Society**, and *"Homology operations in symmetric homology"* in the journal **Homotopy, Homology, and Applications**. Dr. Ault was also granted with the Faculty Research Seed Grant ($5,000) to fund his research that investigates the use of stable module theory in the Hit Problem. Dr. Ault gave the presentation *"The Good, the Bad, and the Ugly: Student Writing in College Algebra"*, part of a panel presentation entitled *"Lessons learned from a WAC Project at Valdosta State University"* in April 4, 2014, which was part of the **Student Success in Writing Conference**, sponsored by Georgia Southern University, held in Savannah, GA.

- **Dr. Jemal Mohammed-Awel** recently published the joint-work articles *"Impact of decay in bed-net efficacy on malaria transmission"* and *"Insecticide-resistant mosquitoes and malaria control"* in the tier-1 journals **Journal of Theoretical Biology** and **Mathematical Biosciences**, respectively. Dr. Mohammed-Awel also published a joint-work article entitled *"A mathematical model studying mosquito-stage transmission-blocking vaccines"* in the tier-2 journal **Mathematical BioSciences and Engineering MBA-AIMS**. Dr. Mohammed-Awel gave several paper presentations of his work at prestigious conferences organized by the **American Mathematical Society** (AMS) and the **Society for Industrial and Applied Mathematics** (SIAM).

- **Dr. Zhiguang Xu** gave an article presentation entitled *"The flocking based and GPU accelerated internet traffic classification"* at the **2014 International Conference on Mathematical Methods, Mathematical Models, and Simulation in Science and Engineering (MMSSE 2014)**, which was held in Interlaken, Switzerland from February 22 to February 24, 2014.

- **Dr. Haiquan Chen** supervised the students T**ravis Gibson, Sherri Burks, Robert Jenkins and Randy French** for their poster and demo presentation *"Let me guess your mind: user activity visualization and prediction"*, which used Google Map API and the collaborative filtering algorithm to predict local user interest/movement with the objective of building a personalized business recommender to serve local people better. This presentation was the best poster runner-up award at the **VSU Annual Undergraduate Research Symposium** in April 2014.

- **Dr. José A. Vélez-Marulanda** published the article *"Universal deformation rings of string modules over certain symmetric special biserial algebra"* in the tier-2 journal **Beiträge zur Algebra und Geometrie**. Dr. Vélez-Marulanda also gave a talk entitled "Deformations and derived equivalence over symmetric algebras" at the conference Algebra, Teoría de Números y Combinatoria (ALTENCOA6 2014) that was held in San Juan de Pasto, Colombia, from August 11 to August 15, 2014.

- **Mr. Peter & Ms. Margery Lohmar** have created **The Elizabeth Joy Lohmar Scholarship Fund for Mathematics** in memory of their daughter and undergraduate student **Elizabeth "Lizzie" Lohmar** (1993-2014), who obtained posthumously her B.A. degree in Mathematics from VSU in May 2014.

- We welcome to our new faculty **Dr. R. Paul Mihail** who obtained his Ph.D. in Computer Science at University of Kentucky.

- **Steven Pugh** (a VSU Math/CS alumni) is currently working in the development of the smart-phone application **Malaria Hunter**, which helps to give rapid diagnosis that lead to quicker treatment of malaria and thus save lives. For more information visit **http://www.appsfortime.com/malariahunter/.**

- The **Fall 2014 Math & Computer Science Faculty/Staff Retreat** took place in August 2014 at the Camp Tygart in Valdosta, GA.

OUR EXPERIENCE IN...

The Sampling Advanced Mathematics for Minority Students Program (SAMMS)

BY ERICA GARCIA*

From July 14th to August 8th, I was selected as a recipient to attend the SAMMS program, which stands for Sampling Advanced Mathematics for Minority Students, at the Ohio State University in Columbus, Ohio. I found out about the SAMMS program through Dr. Velez, and he encouraged me to apply. I applied through an online application on the Ohio State University website. In May, I found out that I had been accepted, and I was one of thirty students from the United States and Central America to attend the program.

During my time at SAMMS, I got to stay in a hotel called The Blackwell, on the campus of OSU. SAMMS program participants were also provided with meal cards, free access to the gym and libraries, and access to a study room reserved solely for mathematics students. We also had weekend trips, such as going to the Center of Science and Industry (COSI), the National Air Force Museum in Dayton, OH, and to the Columbus Zoo.

There were five classes that were offered at SAMMS. These were in the topics of topology, abstract algebra, real analysis, probability and combinatorics, and computational science. It was recommended that SAMMS participants only take three to four classes, so I took five all of the classes for the first week, but then afterwards I decided to focus on topology, abstract algebra, and real analysis, since those classes interested me the most. The material and the pace of these classes were meant to simulate what graduate level classes in these topics would be like. Although I was overwhelmed at some points, I learned a

tremendous amount of material in four weeks, and I believe it has helped me improve my mathematical abilities.

In addition to taking classes at SAMMS, there were graduate school orientations once a week, which covered how to write personal statements and curriculum vitaes, information about support during graduate school, and many GRE preparations, in which we got to keep the practice tests and solutions. In the last week and a half of the program, each participant had to speak with a faculty member at OSU, to ask questions about their research and to explore some topics that they may be interested in. In the last two days of the program, we each had to give fifteen minute presentations about what interested us and what we discovered with the faculty member we spoke with. I was able to speak with Dr. Warren Sinnott, a number theory professor at the university. After all of the presentations were done, each participant was awarded with a certificate for completing the program.

Attending the SAMMS program has definitely opened my eyes to the opportunities that I have, and has made me more confident about applying to and attending graduate school for mathematics. I am very grateful that I had the opportunity to participate in this program!

*Erica obtained a B.A. in Mathematics degree at VSU in December 2014. Erica is currently a graduate student of the M.Sc. program in Mathematics at the University of West Florida.

ATTENTION FACULTY, STAFF, AND STUDENTS
Please send articles of experiences that you want to share with us to:
mathcs@valdosta.edu

THE MATH PROBLEM CORNER

Two friends have a nice meal together, and the bill is $25. The friends pay $15 each, which the Waiter gives to the Cashier. The Cashier hands back $5 to the Waiter. The Waiter keeps $3 as a tip and hands back $1 each. So, the friends paid $14 each for the meal, for a total of $28. The Waiter has $3, and that makes $31. Where did the other dollar come from?

SOLUTION:

$25 is sitting with the Cashier, $2 with the friends, and $3 with the Waiter. That adds to the required $30. The mistake is expecting that what the men paid and what the Waiter kept to add up to what the men initially gave. In fact, it is the amount that the meal effectively cost them, plus the amount they received back, that should add to $30.

What is NUMBER THEORY?

Number theory (or arithmetic) is a branch of pure mathematics devoted primarily to the study of the integers, sometimes called "The Queen of Mathematics" because of its foundational place in the discipline. Number theorists study prime numbers as well as the properties of objects made out of integers (e.g., rational numbers) or defined as generalizations of the integers (e.g., algebraic integers).

Integers can be considered either in themselves or as solutions to equations (Diophantine geometry). Questions in number theory are often best understood through the study of analytical objects (e.g., the Riemann zeta function) that encode properties of the integers, primes or other number-theoretic objects in some fashion (analytic number theory). One may also study real numbers in relation to rational numbers, e.g., as approximated by the latter (Diophantine approximation).

The older term for number theory is arithmetic. By the early twentieth century, it had been superseded by "number theory". (The word "arithmetic" is used by the general public to mean "elementary calculations"; it has also acquired other meanings in mathematical logic, as in Peano arithmetic, and computer science, as in floating point arithmetic.) The use of the term arithmetic for number theory regained some ground in the second half of the 20th century, arguably in part due to French influence. In particular, arithmetical is preferred as an adjective to number-theoretic.

Meet Dr. Ben Wescoatt

Dr. Ben Wescoatt joined the VSU Department of Mathematics and Computer Science in the fall of 2013. He earned a PhD in Mathematics from Oklahoma State University. Prior to attending graduate school, he served 4 years in the navy, teaching mathematics and physics at the Naval Nuclear Power School.

Dr. Wescoatt's research interests are in the field of teaching and learning mathematics at the undergraduate level. Currently, Dr. Wescoatt is exploring pre-service teachers' understanding of numeration as it relates to arithmetic operations with a departmental colleague, Dr. Iwan Elstak. Additionally, through a pedagogical innovation grant provided by VSU's IDEA Center, he is studying the effects of peer instruction on students in a college algebra course.

2014 OUTSTANDING ALUMNI

Mr. Dan Griffin was recognized with the annual outstanding alumni award from the Department of Mathematics & Computer Science on October 23, 2014. Mr. Griffin received his B.S. in Computer Information Systems (CIS) in 1998. While a student at VSU, he participated in the VSU Co-op program for two years, alternating each quarter between taking classes on campus and interning with IBM in North Carolina. After graduating from our CIS program, Dan was hired full time by IBM in the position of Software Quality Engineer. He spent 7 years in Quality Assurance, eventually leading teams across the U.S. and China.
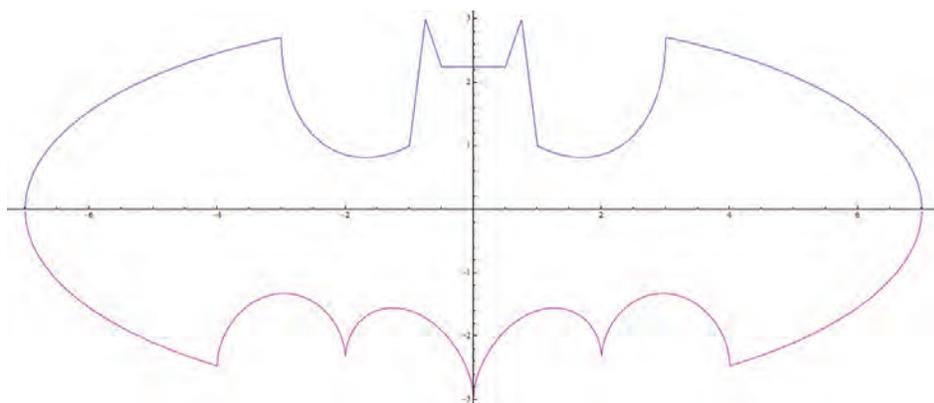
Dan has a long and varied list of professional accomplishments. In his 7th year in Quality Assurance with IBM, he earned an Executive MBA degree from the University of North Carolina at Chapel Hill. After graduating, he transitioned to a software marketing position at IBM. During this time, Dan was also awarded two U.S. patents for methods he developed while at IBM.

Dan epitomizes a lifelong learner. In addition to earning a CIS degree from VSU and an Executive MBA degree from UNC, he also holds an Executive Certificate of Personal Finance from Duke University, is a Certified Scrum Master for product development, and is a Certified Product Manager.

Dan's accomplishments are not limited to his work with IBM. In 2007, he founded the website savvydollar.org, an online coupon community. The timing for the website was fortuitous, as interest in coupons rose significantly when the economy slid in 2008. When Dan sold the website in early 2012, it had accumulated over 10 million page views.

In 2013, Dan left IBM and accepted a new position with Exact Software in Columbus, Ohio as their Senior Product Marketing Manager.

The Department of Mathematics & Computer Science is very proud to recognize Mr. Dan Griffin as our 2014 Outstanding Alumnus.

MATHEMATICA TIP… THE BATMAN *CURVE*

Plot[{With[{w = 3*Sqrt[1 - (x/7)^2], l = (6/7)*Sqrt[10] + (3 + x)/2 - (3/7)*Sqrt[10]*Sqrt[4 - (x + 1)^2], h = (1/2)*(3*(Abs[x - 1/2] + Abs[x + 1/2] + 6) - 11*(Abs[x - 3/4] + Abs[x + 3/4])), r = (6/7)*Sqrt[10] + (3 - x)/2 - (3/7)*Sqrt[10]*Sqrt[4 - (x - 1)^2]}, w + (l - w)*UnitStep[x + 3] + (h - l)*UnitStep[x + 1] + (r - h)* UnitStep[x - 1] + (w - r)* UnitStep[x - 3]], (1/2)*(3*Sqrt[1 - (x/7)^2] + Sqrt[1 - (Abs[Abs[x] - 2] - 1)^2] + Abs[x/2] - ((3*Sqrt[33] - 7)/112)*x^2 - 3)*((x + 4)/Abs[x + 4] - (x - 4)/Abs[x - 4]) - 3*Sqrt[1 - (x/7)^2]}, {x, -7, 7}, AspectRatio -> Automatic]

ATTENTION ALUMNI:

Please send your professional and personal news to *mathcs@valdosta.edu* for inclusion in the alumni section of the newsletter.

A Special Thanks To Our Donors!

The Elizabeth Joy Lohmar Scholarship Fund for Mathematics

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