*After*Math

The Newsletter of the Department of Mathematics at Marshall University

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From the Chair by Ralph Oberste-Vorth

We survived the Spring 2007 semester. It began with the one of the first excursions by our differential analyzer (see the feature article below) and its team to New Orleans for the Joint Math Meetings.

Shortly after that, the tragic fire at the Emmons Junior apartment building claimed nine lives, including three Marshall students. Lin Yuan, a mathematics graduate student, barely survived the fire; her escape with her cousin was documented in news photos and videos. We are thankful that she is still with us!

As the movie *We Are Marshall* reminds us, tragedy can lead to rebirth and renewal. I was truly impressed by the generosity shown to Lin by the community, particularly, the members of the department and fellow students. It was the most amazing expression of love and solidarity that I have ever witnessed.

Joel Better left the department due to health issues. We wish him well. Kusum Subedi replaced him as an instructor.

After two years, Norah is leaving to get married and pursue opportunities in Boston. We wish her well; Pi Mu Epsilon will miss the steady and enthusiastic leadership that she provided.

The semester ended with Marshall's 170th Commencement. One graduating senior, Justin Angus, swept the math awards at the honors convocation, the Pi Mu Epsilon awards, and the college graduation ceremony. Congratulations to all of the graduates!

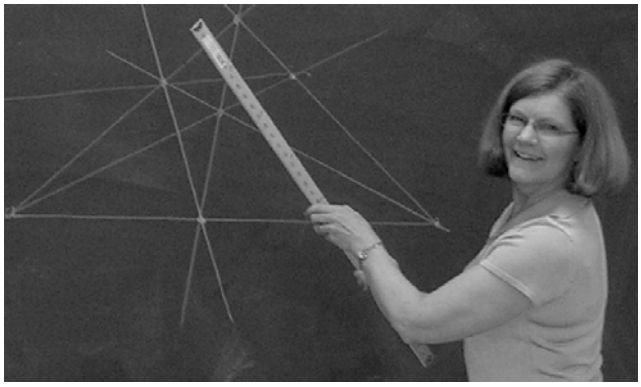
Faculty Profile: Judith (Judy) Silver

Judith (Judy) Silver first joined the department as a part-time instructor in 1978. She credits Steven Hatfield for hiring her at Marshall. Prior to that time, she was studying the "geometry of the diaper" while raising her two girls, Christine Marie and Kathrine Lynn. Hatfield saw her application for a teaching certificate, and seized the opportunity to hire her to teach at the college level instead. After one year as a part-timer, she was hired as a full-time instructor, and then went on to finish her Ph.D. in mathematics at the University of Kentucky in 1988.

Judy is a native of Walla Walla, Washington, and completed her undergraduate degree at Walla Walla College where she was active in school activities, skiing, and sewing. She taught high school in Spangle, WA for one year (1969-1970), and then married Donald Walter Silver. She jokes that it is only natural to change from brown to silver, as one grows older (Brown was her maiden name).

"I love the people at Marshall," Judy says. "After I finished my Ph.D., I had three offers to teach at colleges in the tri-state area. But I wanted to be back on the 7th floor of Smith Hall with the MU professors I had been so happy with before. I have never regretted that decision."

Judy slowly worked her way up the ranks, becoming the department's first female full professor in 1996. She has held a number of administrative positions: associate chair, interim chair and division head, and interim associate dean; she sometimes thinks she works as an "administrative Kelly Girl." Above all, she enjoys teaching, particularly calculus and geometry.



In between teaching, homemaking, gardening, babysitting grandchildren, and doing administrative duties, Judy has found time to author nine publications and administer ten grants.

She is currently very involved with the Math Partnership Grants. These are primarily funded by the No Child Left Behind Act, and involve working with various counties in order to train teachers in the K12 system. She has worked mainly with Mason, Mingo, Lincoln, and Logan counties, grouping special education and mathematics teachers together to study math concepts and find better ways to present them. That particular partnership grant with the RESA II office has been selected as a national program of excellence.

The DA Goes to Washington by Bonita Lawrence

The next exciting chapter in the journal of the Marshall Differential Analyzer Project takes us to Washington, D.C. to the offices of our Senators and Congressmen on Capitol Hill. In November the Marshall Differential Analyzer Team, under the leadership of mathematics major Richard Merritt, submitted an abstract for the annual research poster session, "Posters on the Hill," sponsored by the Council on Undergraduate Research. This is a showcase of creative research projects by undergraduates from across the U.S. in the fields of mathematics, the lab sciences, and the social sciences. In mid-March the team received an e-mail from CUR congratulating them on being

with Senator Jay Rockefeller. He complimented the team on its fine work and Richard on his explanation of the how the machine works and its merit as an educational tool. The photo on the left shows, from left to right, Rebecca Klug, Tom Cuchta, Saeed Keshavarzian, Tue Ly, William Morrison, Bonita Lawrence, John Fishman, Lin Yuan, and Richard Merritt with Rockefeller; Clayton Brooks and Stacy Scudder are not pictured.

selected as one of sixty posters from a field of four hundred in the country.

The Marshall Differential Analyzer Team is a collection of undergraduate and graduate students who have gathered with the common goal of building a model of a mechanical machine, first built in the 1930's at M.I.T., designed to solve a differential equation and plot its solution. The design was created by Vannevar Bush and was first built in England at the University of Manchester by Arthur Porter, a bright young student of physics studying with Douglas Hartree. The creative approach that makes Porter's machine so unique is that he built it entirely from Meccano components, the British version of Erector Set, with the goal of solving particular physics problems that he was investigating for his master's thesis and subsequently his doctoral dissertation. The Marshall DA Team is currently building a model of Porter's machine to be used as an educational tool for the teaching and learning of mathematics. The physical interpretation of a mathematical equation that the machine offers is one of its most valuable features. "The differential analyzer is a perfect way to visualize complex mathematical models," says Keshav Pohkrel, a mathematics graduate student who is preparing to write his master's thesis in differential equations.

The construction component of the project started with a small two-integrator model (we call her Lizzie), offering the team some practical experience working with gear ratios and torque amplification. On April 24th Lizzie, accompanied by nine members of the DA Team and faculty advisors Bonita Lawrence and Clayton Brooks, made her debut in Washington in the office of Senator Robert C. Byrd. There the team met with Byrd's education advisor, Christopher Gould, and demonstrated how the machine is used to solve a differential equation and, more importantly, the perspective it offers the student. Similar presentations were made for Congressman Nick J. Rahall and his education advisor, Katherine Denman, and for Congressman Charlie Wilson's science and education advisors. The highlight of the office meetings was a half hour meeting

The actual poster session was held in the Rayburn House Office Building. Lizzie was displayed in front of the Team's poster and the Team described the project and future plans to visitors from government agencies (including the NSF), professional scientific organizations, and higher education. "It was an eye-opening experience that showed me how little people can make a difference in this big world we live in," exclaimed Richard. Saeed, a senior in mathematics, noted "Meeting with our senators and congressmen to explain our research allowed us to show our representatives why funding undergraduate research is both important and fruitful."

The Team welcomes anyone who is interested in visiting our lab on the third floor of Old Main for a demonstration Lizzie's capabilities and an update on the progress made on the construction of the big machine.

Alumni Profile: Gale Y. Given

Since 2003, Gale Given has been president of public policy and external affairs for Verizon's Great Lakes region. She is responsible for government affairs, community relations programs, and advocacy before regulatory commissions. Previously, Gale was president of Verizon in West Virginia and an executive director for Bell Atlantic in West Virginia.

A native of Point Pleasant, Gale earned a B.S. in mathematics in 1979 and an M.B.A. in 1997, both from Marshall University. Due to her commitment to civic leadership and philanthropy, she was awarded a Doctor of Humane Letters degree at Marshall's 2002 Commencement. In 2005, she was the key-

note speaker at the College of Science graduation ceremony.

Gale began her career at C&P Telephone of West Virginia in Charleston. In 1987, Gale moved to Bell Communications Research. Gale returned to C&P Telephone in 1990, as executive director and then president of West Virginia's Public Policy and External Affairs group.

Gale is a member of the West Virginia Roundtable, the Charleston Rotary, and the New Economy Task Force of A Vision Shared. She serves on the board of the West Virginia State Chamber of Commerce, the BB&T Advisory Board, Marshall University Graduate School Advisory Board, Marshall University Foundation, the Children's Home Society, BIDCO, Discover the Real West Virginia, West Virginia Independent Colleges & Universities, the West Virginia Council for Community and Economic Development, and CAMC Foundation. Gale, her husband, and their three children live in Carmel, Indiana.

From her undergraduate days, Gale recalls how "Dr. Bauserman would draw circles on the board using his handkerchief as a compass" and that "Dr. Whitley gave extra credit for donating blood." She also remembers a student exclaiming, while going over test papers, "If I'd known how to do that, I'd have gotten it right!"

Gale says that she majored in math by accident. She had planned to major in computer science and was advised to take all the math and computer courses, working toward the computer science degree that would be in place by her graduation. It turned out that she wasn't overly fond of the computer classes and thus chose to major just in math. Gale wasn't sure what to do with a math degree that didn't include any teaching preparation. But C&P Telephone came to campus to specifically interview math majors and 28 years later, that career is still in place.

"I have not performed any high level mathematics in my career, but my job has included a great deal of forecasting and of understanding how certain numerics will react with underlying changes." Gale says. "A strong math background has been invaluable. In fact, I am frequently surprised at how many leaders in our business have math degrees. What I learned is that the study of mathematics instructs one on how to think, how to organize data, and how to draw conclusions. Those skills are fundamental to almost any business endeavor."

We know that a math degree can open many doors. Gale recommends the math and MBA combination. She says, "The math degree teaches you to think and the MBA gives you the bigger context to understand the business issues."

Other Faculty News

Alfred Akinsete participated in four meetings and is supervising Charles Lowe, junior in applied mathematics, in a Summer Undergraduate Research Experience project.

Ariyadasa Aluthge gave a talk at the South Eastern Analysis Meeting at the University of Richmond in March.

Clayton Brooks (BA'88) is the Secretary of the Faculty Senate.

Yulia Dementieva was granted tenure in April.

Bonita Lawrence was promoted to full professor in April. She gave a talk at the Joint Math Meetings in New Orleans in January.

Bonita Lawrence and **Ralph Oberste-Vorth** received the 2006-07 Marshall University Distinguished Artists and Scholars Award in April.

Karen Mitchell gave a talk at the Association of Mathematics Teacher Educators annual conference in January and attended three other conferences.

Ralph Oberste-Vorth gave a talk at the Joint Math Meetings in New Orleans in January.

Evelyn Pupplo-Cody attended the Joint Math Meetings in New Orleans in January, interviewing some 50 faculty candidates ably leading the Search Committee.

ΠME News by Norah Esty

Pi Mu Epsilon had another active semester this semester! Two new members, Charlie Lowe and Danielle Clark, both sophomores, were inducted. They joined our newly elected President, Devon Tivener, our Vice President, Michael Price, our Secretary, Tom Cuchta, as well as Patrick Riley and myself on our visit to the local Mathematics Association of America conference at Shawnee State University in Ohio. The conference, which was held in April, was full of interesting talks—some on zombies! Our own Tom Cuchta gave a very good talk about his participation with the Differential Analyzer project. Afterwards we headed to a local restaurant and ate several pounds of chicken wings. The trip was a rousing success.

The rest of the semester was busy, too, with lots of meetings where lots of pizzas were eaten. At one meeting I gave a talk introducing some basic iterative dynamics and giving examples where chaos occurs. At another, Peter Saveliev, associate professor of mathematics, gave a fascinating talk entitled "Elementary Computer Vision," showing how algebraic topology can be used to assist in programming computers to recognize images the way that humans do.

At our final meeting during the last week of the semester, we had the yearly awards ceremony recognizing our outstanding juniors and seniors, three of whom are our own Pi Mu Epsilon members: Outstanding Graduating Senior Justin Angus and Outstanding Juniors Michael Price and Ashley Ezell. Michael Lake was also named an Outstanding Junior. Sadly for us, Justin Angus is graduating this year, as are Adam Ehlert and Kristen Grinstead. We wish them luck and a great summer to everyone!

Alumni News (Send us your news.)

Carrie (Toth) Dugan (B.S. '86) I enjoy receiving *After*Math. It is nice to hear about the wonderful professors I've lost touch with over the years. After graduating from Marshall I worked in the actuarial field for over 11 years because of Dr. Carlton's inspiration to do so. He even helped me get my first job. I gained much valuable experience and knowledge in that career. For the last several years, however, I left that career and have been pursuing my PhD in pure mathematics at Kent State University. I'm scheduled to defend my dissertation this summer. I attrib-

ute my love of mathematics to many wonderful professors at Marshall. I should also mention Dr. Lancaster and Dr. Cusick, who have inspired me to pursue my dream of obtaining a PhD. I look forward to future newsletters to help me feel in touch with my mentors.

2006–07 Graduates

We wish to honor the graduates in mathematics and mathematics education. Justin Angus graduated Summa Cum Laude. Tebaliah Casto and Mallory Wells graduated Magna Cum Laude, Kiera Collier, Adam Ehlert, and Pamela Slone graduated Cum Laude.

Bachelor of Science in Mathematics

May 2007

Justin Angus (physics) Steven Oliver (history)
Adam Ehlert

December 2006

Christopher Hobt Ryan Strippel
William (Mike) Morrison

Master of Arts in Mathematics

May 2007

Sarah Barber John Kirby Hui Luo

BA Secondary Education, Mathematics 5–12/Adult

December 2006

Kiera Collier Courtney Parsons Pamela Slone

BA in Secondary Education, Mathematics 5–9

December 2006

Thomas Cisco (also General Science 5-9)
Stacey Ellis (also Social Studies 5-9)

BA in Elementary Education, Mathematics 5–9

May 2007

Tebaliah Casto

December 2006

Mallory Wells

MA in Elementary Ed., Math through Algebra I

May 2007

Meredith Hovious

MA in Secondary Ed., Math through Algebra I

December 2006

Stacey Carlson

Masters Thesis (advisor name in parentheses)

Hui Luo (Bonita Lawrence)
Population Modeling by Differential Equations

Contact Us

- voice: (304) 696-6482 or
- fax: (304) 696-4646 or
- e-mail: aftermath@marshall.edu or
- mail: *After*Math, Department of Mathematics, Marshall University, One John Marshall Drive, Huntington, WV 25755.

*After*Math
Department of Mathematics
Marshall University
One John Marshall Drive
Huntington, WV 25755

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