# The SUMS Conference at James Madison University

*By Elizabeth Brown and Laura Taalman*

The Shenandoah Undergraduate Mathematics and Statistics (SUMS) Conference is a yearly undergraduate research conference held at James Madison University in Harrisonburg, Virginia. The heart of the SUMS conference consists of contributed undergraduate talks on original mathematical research. Additional events include research and expository poster sessions, invited faculty speakers, opportunities for networking and social interaction, and practical panel sessions on REU programs, graduate school, and careers in industry. There is also a high school outreach component to SUMS.

*Ed Burger lectures at the SUMS Conference.*

The conference is a one-day event held in early fall. The organizers' intent is that the conference provide an optimal venue for sharing the results of summer research projects, while inspiring other students early enough in the academic year that they can pursue research during the school year or following summer. The day starts and ends with dynamic invited addresses that are both accessible and mathematically robust. Arthur Benjamin, Edward Burger, Tim Chartier, and Greg Warrington have all been SUMS speakers; their talks were enjoyed by conference attendees of all types.

Undergraduate talks occupy a central position, with parallel sessions through the middle of the day. Contributed posters are on display throughout, and are judged during an extended lunch hour when students can be on hand to describe their work and answer questions. After the afternoon's parallel research talks come panels about undergraduate research programs, mathematics careers, and graduate school. Tea time provides an opportunity for informal networking, followed by awards and recognition of the student contributors, and the closing address. In 2005, SUMS hosted 233 conference participants from 27 colleges and universities and 6 high schools, with 16 student talks and 11 student posters. In 2006, SUMS grew to an attendance of 252 people from 30 undergraduate institutions and 5 high schools, with 23 student talks and 27 student posters.

Fostering an upbeat, welcoming tone has been important to the success of the conference. We find it helpful to remember that an undergraduate conference can be an interactive social event as well as an academic one. At SUMS, we schedule a number of open networking times (coffee, tea) for participants to get to know one another. This year we set up a puzzle table where people could stop throughout the day and solve various mathematical and geometric puzzles. This was a very popular location for students, faculty, and even the children of participants. Both years, we distributed Sudoku and mathematical puzzle packets free to participants. These were received with enthusiasm. Attendees are invited to an informal speakers' dinner the evening before the conference. This past year we were able to coordinate a special reception at the JMU New Image Gallery, which was hosting an exhibit of contemporary mathematical photography and new media.

James Madison University is located about two hours west of Washington, D.C. It is one of the larger schools in the rural Shenandoah Valley area, so it made sense for us to develop an event at which students from nearby colleges and JMU could be exposed to mathematical research at the undergraduate level. We have also been successful in attracting students from nearby states, and as far away as Ohio and Kentucky. Much of our conference funding is spent assisting student speakers with travel and hotel stipends. Other funding enables us to attract well-known, entertaining invited speakers that have a particular knack for energizing undergraduate audiences.

In addition to providing an academic resource for the Shenandoah Valley, the SUMS conference adds to the academic culture of the JMU Department of mathematics and statistics. It has helped to bridge the divide between the department's ongoing NSF-funded REU program, which takes place over the summer, and JMU students who are on campus during the academic year. This is changing the way our students think about mathematical research. One of our students, Sara Toosarvandani, put it this way: "SUMS really made me want to present a talk/poster for the next year. I went to SUMS two years in a row now and felt my Saturday was well spent both times!"

JMU student participation in the poster

sessions increased from 5 posters in 2005 to 19 posters in 2006. Many of our students have decided to pursue thesis projects or apply to REU or other extracurricular mathematics programs after attending SUMS and seeing firsthand that their peers can and do engage in original mathematical research projects. It even seems that more of our students are now interested in pursuing graduate school in mathematics. In addition, many of our students work side-by-side with faculty members in organizing the conference itself. By doing so, these students get to know the faculty better and become more involved members of our department, along with developing a sense of ownership about the conference.

The SUMS conference also reaches out to area high school students and faculty. We advertise the conference to high schools within driving distance and to Governor's Schools across the state. We provide funding when necessary to help defray travel costs for high school participants. Just as undergraduates can have a great experience at a faculty research conference such as MathFest or the Joint Mathematics Meetings, we believe that high school students can learn much from attending an undergraduate research conference. The poster competition has a high school category. While the number of entries in this category so far has been limited, quality has been high, and we expect the numbers to grow as we establish relationships with interested high schools. A workshop for the American Mathematics Competitions runs concurrently at JMU with the afternoon portion of the SUMS conference, providing an added draw for high school teachers and students.

Starting an undergraduate research conference and, more importantly, keeping it going from year to year, are momentous tasks, but they are also extremely rewarding. A well-thought out conference on any scale is worthwhile, so we encourage interested organizers to give it a try. For those considering starting a similar conference at your school, we offer the following sage advice: Delegate. Start preparations early. Get an army of students who are willing to help. Delegate some more.

*The puzzle table offered challenging entertainment.*

The SUMS conference is one of a growing number of undergraduate research conferences funded through the MAA/NSF Regional Undergraduate Mathematics Conferences (RUMC) grant program. SUMS also receives significant funding from JMU itself, at the club, department, college, and university levels. Other support comes from the Blue Ridge chapter of the Association for Women in Science, Pi Mu Epsilon, and the NSF-funded REU program at JMU. In addition, various book publishers have made generous contributions of books or other swag to the SUMS conference. At each conference we have been able to award each and every student speaker with a quality high-level math text, many of which are worth over $100. We get the books well in advance of the conference, and can match each student speaker with an appropriate text for their field of research. This past year so many books were donated to SUMS that we were also able to award small books for each poster presentation.

**Interested in Hosting an Undergraduate Conference?**

The MAA Regional Undergraduate Mathematics Conference program provides funds to help. Visit http://www.maa.org/rumc for details.

The 2007 SUMS conference will be held on Saturday, October 13. We encourage you to attend! For more information, please see our website at http://www.math.jmu.edu/SUMS.

*Elizabeth Brown has been at James Madison University since 2003, following a postdoctoral appointment at Dartmouth College and graduate work at Boston University. Her mathematical research is in set theory. Her other academic interests include the teacher training of mathematics graduate students for college and university careers, the philosophy of mathematics and science, and mathematics in fine and performance art. This summer, she will serve as a mentor in an internally funded REU program for JMU students. Before discovering the joys of mathematics, she studied epistemology in the context of analytic philosophy for a first Master's. She is a 2002-3 Project NExT fellow. She has the dubious honor of being a winner of the 2007 JMU Mathematics and Statistics Department Pi Day contest (held on March 14 at 1:59), in which students donate money to a charitable cause in order to be able to throw pies at the top three faculty earners.*

*Laura Taalman came to JMU in 2000, directly after completing her graduate work at Duke University. In addition to her work in singular algebraic geometry, she has written an award-winning calculus text and an award-winning expository article that had nothing to do with calculus, along with articles on the teaching of university mathematics, the mathematics of games, and knot theory. As a partner in Brainfreeze Puzzles, she is the author of several published puzzles and a forthcoming book,* Color Sudoku. *She is active in the department's NSF-funded REU program, with a third mentorship planned for this summer, and in the sectional leadership of the MD/DC/VA section of the MAA. Laura is the winner of the 2006 Alder award and, with Eugenie Hunsicker, of the 2002 MAA Trevor Evans award for mathematical exposition. She is a 2000-1 Project NExT fellow. She was also a winner in this year's Pi Day contest.*