

NEWS

from the Department of Mathematical Sciences

EXCEL • CREATE • DISCOVER • CONNECT • EXPLORE • SERVE

INNOVATION IN CLASSROOM

Giving a great lecture is an artform and an important skill for our instructors to master. We are probably never going to drop the lecture, but are excited to share a variety of curricular changes which are more engaging for students.

A major push from the Provost's Office has provided MSU with two new Technology Enhanced Active Learning (TEAL) classrooms where students work in groups at round tables. In M121 the topics covered in a TEAL room are the same as in the traditional sections, but students watch a short video before coming to class, then work on practice problems while getting help from their group and the instructors during class. This is a technique called "flipping" the classroom because homework becomes classwork and information acquisition occurs before class. Using the crude metric of success is an A, B or C letter grade and D, F or withdraw are "non-successes," the success rate in TEAL classes was 81 percent for Spring 2013 as compared to 61 percent for traditional sections.

In STAT216, an experiment is underway to evaluate a new curriculum which is built around group activities. Students do readings outside of class, then in the TEAL classroom they are given a short introduction to the day's problem, which they work on it together using computers and simulation software (no more z and t tables) and the class concludes with a wrapup to ensure the correct lessons were learned. Again the crude success rate of five pilot sections in Spring 2013 is encouraging in that 86 percent earned a C or better compared to 65 percent in traditional lectures.



TEAL classroom in Gaines Hall.

STUDENT NEWS

KOPRIVA GRADUATE STUDENT FELLOWSHIP



Sydney Akapame was awarded a Kopriva Graduate Student Fellowship. His research has wide scientific applicability, and specifically in the pharmaceutical and medical sciences. One research application is calibration for logistic models, which are often used in pharmaceutical applications such as bioassays. A second application is the precise estimation of the absorption rate and elimination rate parameters of compartmental models which are used in the mathematical modeling of how drugs (or other substances) circulate through the body over time.

DEANS' AWARD FOR ACADEMIC EXCELLENCE



David Halat received the Deans' Award for Academic Excellence. This award is presented to the top two seniors in the college. Halat is commended for his excellent scholarship, which has been recognized with several prestigious awards including a Barry M. Goldwater Scholarship. In addition to his academic accomplishments, he has been an indispensable student leader in both departments (Chemistry and Math). He has been a tireless volunteer for community outreach

events such as NanoDays and Frankenscience, as well as serving in leadership roles for several student groups.

PHD ENHANCEMENT AWARD



Diana Schepens received PhD Enhancement Award from the MSU Graduate School which includes a \$18,000 teaching assistantship stipend. Diana will provide support to help improve course delivery and instructional needs of graduate teaching assistants, adjunct instructors and faculty course coordinators.

31ST ANNUAL AWARDS FOR EXCELLENCE HONORS

Katelyn Weber was one of 40 MSU seniors to be honored with her mentor, Mark Greenwood, at the 31st Annual Awards for Excellence banquet. Honored students were nominated by faculty in their college or department. Qualified seniors must have at least a 3.5 grade point average on a 4.0 scale, as well as demonstrated campus leadership and community service.

MATH OFFICE NEWS

On July 1, 2013, I returned to the faculty in the Department of Mathematical Sciences, having served 12 years as department head. This seems an appropriate time to reflect on the changes we experienced over those years and to peer into the future of our department. It has been a delight to work with the faculty, staff, graduate students and undergraduate students in our department. Their accomplishments have reflected so brightly on our fundamental missions of teaching and research. Combined with our alumni and donors, we form a family centered upon our love of, and appreciation for mathematics. Our 112 year history, beginning in 1901 with our first department head Bill Tallman, is one filled with professionals who devoted their careers to this department. What an incredible legacy we can continue for the future.

The past 12 years have been remarkable. MSU's enrollment has grown 27 percent while our number of departmental majors has increased a whopping 43 percent. Throughout this time we have consistently delivered more than 10 percent of the total MSU student credit hours. While our faculty size has not increased, our department's research grant dollars have more than tripled. We publish at a higher rate per faculty member today and make professional presentations around the state, nation and world more often than ever before. Thanks to the generosity of our alumni and friends our departmental endowment has more than quadrupled, the proceeds of which we use to continually improve our programs. During this time, with the strong support of our undergraduate majors, we implemented a Mathematics Program Fee which benefits students enrolled in mathematics courses. Through all of these transitions, one thing was a constant; we delivered superb learning opportunities for thousands of students. Whether at the undergraduate or graduate level, students affiliated with our department were able to grow as mathematicians and as well-informed citizens with the critical thinking skills so valuable in today's society.

Through the dedication and foresight of our faculty, staff and students, we have experienced many positive changes. Faculty who were young and full of promise in 2001, have now become the pillars of our department and we are currently welcoming several new faculty members that hold the same promise for their future and ours. Outstanding student accomplishments include nine Goldwater scholars, three Fulbright Scholars and three recipients of the Dean's Award for Academic Excellence. Our faculty received more than 25 University and College awards for excellent teaching and research. Several of our faculty members have also been named national Fellows of the American Mathematical Society or the American Statistical Association in recognition of lifelong achievements. What accomplishments!

Now the leadership of our department goes to our ninth department head, Dr. Tomas Gedeon. Tomas has been an extraordinary colleague for over 20 years, both as a superb researcher in applied mathematics and as an outstanding teacher at both the undergraduate and graduate levels. Most importantly, he has a vision for the future that will guide the next generation of the Department of Mathematical Sciences. Please welcome Tomas and provide him with your support. He is yet another member of our departmental family that has come to reflect the very best that an academic community can be.

— Ken Bowers

STUDENT NEWS CONTINUED

COLLEGE OF LETTERS & SCIENCE GRADUATE STUDENT TEACHING AWARD

Olga Vsevolozhskaya won the Letters & Science Graduate Student Teaching Award. She has taught four different math and statistics courses, and no other GTA in recent memory has taught such a diversity of courses. Faculty members in the department note that she excels at explaining complicated concepts to students, constantly works to improve her courses, and does her work with little or no supervision.

ELLIS R. OTT SCHOLARSHIP

Alyssa Peck received an award of \$7500 for the Ellis R. Ott Scholarship which is awarded by the American Society for Quality to a graduate student in a program that has a concentration in applied statistics and/or quality management. The award is based on “demonstrated ability, academic achievement, faculty recommendations, student involvement in campus activities, including teaching and tutoring, and industrial exposure including part-time work and internships.”

FACULTY NEWS

NEW ASSISTANT PROFESSORS

We are very excited about our two new Assistant Professors of Statistics who started this fall, Dr. Jennifer Green and Dr. Laura Hildreth. Both Dr. Green and Dr. Hildreth come to us with unique research programs, the desire for collaborative work with other researchers, and a strong background in and love for teaching.



Dr. Jennifer Green earned her PhD from University of Nebraska, where she also worked as a research assistant professor for the last three years. She brings to the

department unique and valuable experience in Statistics Education, from both a research perspective and a teaching perspective. She is currently part of a National Science Foundation grant with a focus on developing statistical methodology to help characterize the impact of professional development on teacher effectiveness and student learning, and was just awarded another NSF grant with the goal of characterizing the impact of a teacher or intervention programs on “real-world outcomes,” such as STEM career-persistence. We are looking forward to fruitful collaborations with the Mathematics Education faculty members as well. Dr. Green is a native Nebraskan, and needless to say is a dedicated Huskers fan. We welcome her and her family to Montana and know they will also be Cats fans before long. She is even looking forward to trying some skiing or snowshoeing despite not being a fan of cold weather.

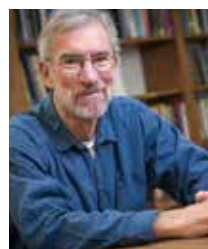


Dr. Laura Hildreth comes to MSU after earning her PhD in Statistics from Iowa State University. She has another graduate degree in applied economics from

University of Minnesota - Twin Cities, and she brings new expertise to our department in structural equation modeling, which is becoming more common across many scientific disciplines. She is generally interested in social and behavioral science research and is looking forward to building collaborative

relationships with other MSU researchers in these areas. She is currently teaching an introductory statistics course for graduate students in other departments, as well as the second semester of the mainly undergraduate introductory class. She is originally from northern Minnesota which explains her loyalty to the Minnesota twins and the fact that she is not at all intimidated by the imminent Bozeman winter. She is also very happy to have traded the flatlands of Iowa for the mountains of Montana, and we welcome her to Bozeman.

HIGHEST HONOR



Prof. Marcy Barge received the highest honor a mathematician can get, when he was named a Fellow of American Mathematical Society (AMS) which will celebrate its 125th anniversary in 2013. The AMS is the world’s largest organization dedicated to mathematical research, scholarship and education. Of its 30,000 members, 1,119 were named Fellows this year.

He also received Research and Creativity Award. Barge is a widely published researcher whose contributions to the field of dynamical systems and topology are recognized nationally and internationally. His current research program is focused on tiling theory and its connection to dynamical systems. During his career, he has published 59 papers in many of the most prestigious journals available to pure mathematicians. He recently retired from MSU in May 2013.

HONORARY DOCTORATE



Prof. John Borkowski received an Honorary Doctorate from Thammasat University (Thailand) for his contributions to their doctoral program in Statistics. Since 2005, John has taught graduate courses, co-chaired three doctoral dissertations, four masters theses, and continues to mentor doctoral students in Thailand. With his aid, a General Agreement between MSU and TU

was formed in 2007. As a result, graduate students from TU and a Thai post-doctoral student have visited MSU to work with John. He has also recruited a lecturer from TU into the PhD program in Statistics at MSU.

DISTINGUISHED PROFESSOR



Prof. Tomas Gedeon was named 2012 College of Letters & Science Distinguished Professor. Gedeon’s contributions to a wide range of applied mathematical

problems are nationally and internationally recognized. Over the last few years, he has published several important papers in mathematical neuroscience, systems biology and mathematical biology, and has developed an international reputation for his excellent and insightful contributions to our understanding of the structure and function of biological systems. Also, he became the Mathematical Sciences Department Head July 2013.

CROSS COLLABORATIONS



Prof. Megan Higgs helps researchers from Montana to Antarctica examine diverse ecological questions. She works with the Interagency Grizzly Bear Study Team to

address questions about grizzly bears in the Greater Yellowstone Ecosystem, and has helped researchers studying blister rust in whitebark pine assess whether accurate predictions of infection can be made related to climatic and topographic variables. She also collaborates with graduate students in ecology on numerous research projects, ranging from the relationship between cow elk predation and habitat characteristics in Yellowstone, to individual variability in reproductive success of Weddell seals in Antarctica.

NON-TENURE TRACK FACULTY

PRESIDENT’S EXCELLENCE IN TEACHING AWARD 2013



Dr. Christina Hayes received the President’s Excellence in Teaching Award 2013. She is known for her creativity and passion for teaching mathematics

and statistics. She was instrumental in founding the math club and encourages students to branch out into research. Christina organizes undergraduate seminars, recruitment visits and advises students participating in an international math modeling competition.



NOTE TO FORMER STUDENTS

We truly value the role you played in the Department of Mathematical Sciences at Montana State University. We hope that your time here led you to a rewarding career and that our people and programs were just what you hoped they would be. We will continue to use these newsletters to update you on all of the extraordinary things going on here in Bozeman.