from the Department of Mathematical Sciences

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FEATURES

FALL 2012

INTERDISCIPLINARY RESEARCH IN THE NORTHWEST



Dr. Jack Dockery is involved in a joint research project with Dr. Martin Schuster in the Department of Microbiology at Oregon State University, funded by the National Science Foundation. Though historically these fields are an unusual pairing, our applied mathematicians are now routinely forging many new connections with scientists from various disciplines. This particular project will study bacterial cell-to-cell communication which is often referred to as quorum sensing. Recent experimental work has led to the hypothesis that antiactivators have

Jack Dockery

evolved to prevent short-circuiting. This project is designed to combine experimental work with mathematical modeling for the benefit of both fields. Dr. Dockery will develop a mathematical model of this quorum sensing circuitry. He has been involved in mathematical biology research for over two decades, including work with the Center for Biofilm Engineering here on campus.

ACCELERATING TO A MASTER'S DEGREE





Top: Eric Fink Bottom: Kelly Spendlove

degree program that eliminates one year in the typical six-year program to earn a B.S. and a M.S. in Mathematics. This year our first two candidates, Eric Fink and Kelly Spendlove, are in their "+1" year, planning to finish their M.S. next spring after having completed their B.S. in Mathematics last spring. Hard work and lots of careful planning with their advisor has placed them at the point where they can proudly walk out the door with both degrees in May, 2013. Simultaneously, they are enjoying the typical mathematics graduate school experience of serving as Graduate Teaching Assistants. This program should benefit many of our hard-working math majors for years to come.

The Department of Mathematical Sciences recently designed a 4+1

TOMAS GEDEON GIVES KOPRIVA SCIENCE SEMINAR

Dr. Tomas Gedeon presented a talk in the Kopriva Science Seminar Series, which is funded through an endowment and focuses on research in the biomedical sciences. Tomas discussed what mathematical models are and what we can expect from them. He also introduced his current research project, which models the transcription process of ribosomal genes in bacteria in an attempt to understand the limitations this process imposes on their growth rate.



Dr. Isaac Klapper was a recipient of this year's Charles and Nora L. Wiley Faculty Award for Meritorious Research and Creativity. Isaac is a world-renowned leader and pioneer in the mathematical modeling and simulation of biofilms. A Harvard graduate and former Fulbright scholar and NSF postdoctoral fellow, he has helped make MSU's Center for Biofilm Engineering (CBE) a world leader in biofilm research. Besides being awarded the CBE's Faculty Research Award in 2010, he

is the principal investigator on four recent NSF grants that total more than \$1 million. He has published more than 40 peer-reviewed articles and made more than 50 invited presentations at local, national and international levels since coming to MSU in 1996.



^{College of} LETTERS <u>हन</u> SCIENCE

DAVID HALAT: GOLDWATER SCHOLAR David Halat, a Bozeman native, is a double

major in mathematics and chemistry who recently won a Goldwater Scholarship. The scholarship is the nation's premier scholarship for undergraduates studying math, natural sciences and engineering. The Goldwater Foundation was established in 1986 and MSU is one of the nation's top institutions for Goldwater recipients since that time. Halat is the 54th MSU student and 9th from our department to win this premier scholarship. He began at MSU as a chemistry major. He decided to add a second major in mathematics after taking higher level math courses at MSU and realizing that he enjoyed the integration of chemistry and mathematics. Majoring in mathematics also allowed him to enter the national Putnam Math Competition in 2010 and 2011. He achieved MSU's highest individual result both years, and one of his team members was Casey Donoven of Kremlin, Montana, also a math major and a Goldwater recipient the previous year.



Tomas Gedeon

Isaac Klapper

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.

FACULTY NEWS

JEFF BANFIELD RETIRES

Dr. Jeff Banfield retired from our Department last spring. He received his Ph.D. in Statistics from the University of Washington in 1988. He then joined our department that same year and was on the faculty at MSU for the past 24 years. Dr. Banfield served on many Ph.D. and M.S. committees during his career. During his career he was funded by the Office of Naval Research on three separate grants, by the National Science Foundation, by the Department of Defense, and by the National Aeronautics and Space Administration. Over 20 years ago, he was the original developer of a course in graphical data analysis that remains a bedrock of our undergraduate statistics major even today. He also was instrumental in developing online statistics courses, both at the graduate level and in introductory undergraduate statistics. During 1995–97 he spent two academic years at the American University in Cairo, Egypt as a visiting professor. In the past several years, Dr. Banfield has played an instrumental role in the Core 2.0 curriculum, teaching University Seminars for freshmen. He also taught for the University Honors Program. Jeff's wife, Lisa, was an adjunct in our



Jeff Banfield

department for several years and they are both currently enjoying life after MSU.

RICHARD SWANSON RETIRES



Dr. Richard Swanson retired from our Department last spring. He received his Ph.D. in Mathematics in 1976 from the University of California – Santa Cruz. After a position at the University of Missouri, he joined our depart-

Richard Swanson

ment in the fall of 1982. He was on the faculty at MSU for 30 years. Dr. Swanson was a member of what is now an internationally

RUSS WALKER RETIRES

Dr. Russell Walker retired from our Department last spring. He received his Ph.D. in Mathematics in 1977 from the University of California - Berkeley. After positions at Idaho State University, the University of Colorado, and the University of Missouri, he joined our department in the summer of 1981. He was on the faculty at MSU for 31 years. He was the first member of what is now an internationally known research group at MSU in dynamical systems. He directed two Ph.D. students and served on dozens of M.S. committees. During 1988-90 Dr. Walker served as the Geometric Analysis Program Director in the Division of Mathematical Sciences at the National Science Foundation. Beginning in 1993, he

known research group at MSU in dynamical systems. He chaired one Ph.D. committee and served on dozens of M.S. committees. In the past several years, Dr. Swanson has played an instrumental role in the Core 2.0 curriculum, teaching on more than one occasion University Seminars for both freshman and for students more advanced in their programs. He was instrumental in introducing calculus reform into the curriculum at MSU and has invested much time and energy in supervising our freshman calculus sequence. Beginning in 1993, he was a Co-PI on a five-year NSF - EPSCOR

was a Co-PI on a five-year NSF - EPSCoR grant for the Montana Group for Nonlinear Science. Later during 1998–2001, he was a Co-PI on a four-year National Science Foundation institution-wide reform grant at MSU that funded mentoring activities for new faculty and graduate students, crosscampus evaluation of teaching reforms, and assessment activities. Dr. Walker served as Assistant and later Associate Dean of the College of Letters & Science (CLS) from 1995-2005. During that time, he served as the CLS Liaison to the College of Graduate Studies and as a senior advisor to the Hewlett Foundation-supported general education reform project. Beginning in 2008 he was the MSU Unit Coordinator for

grant for the Montana Group for Nonlinear Science. In addition, his research has been funded by the National Science Foundation, the Institute for Nonlinear Science in France, and the Center for Mathematical Research in Spain. During his career, Dr. Swanson published 36 papers in ergodic theory, global analysis, and dynamical systems. He presented his research numerous times at universities and conferences in the U.S. and abroad. He was also a visiting Professor at both the University of Nice and the University of Barcelona. Richard and his wife, Rose Toth, continue to live in Bozeman.

the Montana University System (MUS) Transfer Initiative where he devoted extensive time to the implementation of the Common Course Numbering system for the entire MUS. Dr. Walker's teaching



Russ Walker

excellence was recognized in 2009 when he received an MSU Award for Excellence. Russ is married to Judy Tucker, who was an adjunct instructor in our department for many years. They both do some post-retirement teaching for our department, as they reside in Bozeman.

STUDENT NEWS

ENROLLMENT

Enrollment at MSU saw yet another dramatic increase this fall. Enrollment went from 12,764 fall 2009 to 13,559 fall 2010 to 14,153 fall 2011 to 14,649 fall 2012. Our department continues to mirror these increases. We have 23 new full-time graduate students, bringing our total full-time enrollment to 78. In addition, we have 14 teachers around the country enrolled in our distance delivery graduate program for mathematics education. We have an excellent new class of 23 undergraduate math majors and our undergraduate program now has 142 majors in our four options; applied mathematics, mathematics, mathematics education and statistics. Last year we awarded 21 B.S. degrees, 18 M.S. degrees and three Ph.D. degrees.