

DEPARTMENT OF MATHEMATICS NEWSLETTER

PAUL KENNEDY AWARDED UNIVERSITY
DISTINGUISHED TEACHING SCHOLAR

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Dr. Paul Kennedy

A professor known for his innovative teaching and research at Colorado State University, Paul Kennedy has been selected as a University Distinguished Teaching Scholar, an honor conferred upon a total of 12 outstanding faculty.

"Professor Kennedy's notable career in mathematics here at Colorado State University, and his outstanding work with the National Science Foundation to reduce the achievement gap in mathematics and science, have been a great benefit to students at CSU and across the nation," said President Larry Edward Penley. "His

work to improve mathematics education for students of all levels is a prime example of Colorado State's commitment to improving science and mathematics curricula and demonstrates the university's capacity for continued leadership in this area."

"Paul's innovations in the classroom exemplify faculty work at Colorado State," said Tony Frank, provost and senior vice president. "Paul is well deserving of this top award because of his dedication to our students and their learning experiences through mastery learning principles and online and classroom instruction."

The designation as a University Distinguished Teaching Scholar remains with the recipient until he or

she leaves the university.

Current University Distinguished Teaching Scholars are Pattie Cowell, Kate Kiefer and Mike Palmquist, Department of English; Ken Barbarick, Department of Soil and Crop Sciences; Ingrid Burke, Department of Forest, Rangeland and Watershed Stewardship; Rich Feller, School of Education; Nancy E. Levinger and Stephen Thompson, Department of Chemistry; Ray Whalen, Department of Biomedical Sciences; and Douglas Hoffman, Department of Marketing. Retiring are James Boyd, Department of Philosophy; and Wayne Viney, Department of Psychology.

For complete details go to: <http://tilt.colostate.edu/udts/kennedy.cfm> or http://today.colostate.edu/index.asp?url=display_story&story_id=1004551

SPECIAL RECOGNITION

2008 GRADUATES
CANDIDATES

SPRING 2008

PhD — 3

MS — 3

Undergrad Majors — 39

Undergrad Minors — 35

SUMMER 2008

PhD — 4

MS — 2

Undergrad Majors — 6

Undergrad Minors — 5

PROMOTION AND TENURE AWARDED



Dr. Anton Betten

Mathematics department faculty Anton Betten, Iuliana Oprea and Rachel Pries were tenured and promoted to associate professor this year.

Dr. Betten joined the university in 2002. His research is in coding theory. Dr. Oprea joined the department in 2000. Her research



Dr. Iuliana Oprea



Dr. Rachel Pries

is in applied mathematics, specifically in dynamical systems. Dr. Pries joined the university in 2003. Her current research focuses on the study of geometry of characteristic p.

MATHEMATICS
DEPARTMENT CHAIR
REAPPOINTED



Dr. Simon Tavener

After completing his first term as Chairman of the Department of Mathematics, Simon Tavener has been reappointed to a second term.

During the 2008 fall semester, Dr. Tavener will be on sabbatical leave at Oxford University. During his leave, Gerhard Dangelmayr will be the interim department chair. Jim Thomas will fill in as the Undergraduate Director for the department.

PROFESSOR RICHARD DARST RETIRES AFTER 35 YEARS OF DEDICATED SERVICE



Dr. Richard Darst

Professor Richard Darst has officially announced his retirement from the Department of Mathematics after 37 years of dedicated service.

Professor Darst received his BS and MS in mathematics from the Illinois Institute of Technology in Chicago in 1957 and 1958. He earned his doctoral degree in mathematics from Louisiana State University at Baton Rouge in 1960. Subsequently, he taught at MIT, Purdue and the University of California at Riverside. Dr. Darst joined CSU in the fall of 1971. Until 1973, he held the position of Professor at Purdue University.

Professor Darst was an active contributor to the graduate program. He mentored and advised 18 master and 12 doctoral students to degree completion. He serviced on numerous graduate student committees and was a temporary adviser to many graduate students. Over the years he wrote a number of qualifying exams and acted as director of graduate studies from 1978-1981 and 1989-1995.

Professor Darst was active in a number of administrative duties within the department. In addition to his graduate director duties, he served on the executive committee and directed the visiting professor program.

Professor Darst's research program focuses on analysis. Beginning in 1960, he has published in real analysis, measure and integration, probability theory, functional analysis, approximation theory, optimization and fractal geometry. In addition to teaching mathematics courses, he began teaching distance learning courses in optimization in 1985.

Professor Darst's teaching career spans over 50 years. He is gratified by the success of his students, including a university president, department chairs, a MAA governor, and many teacher of the year awards.

The Mathematics Department thanks Professor Darst for his dedication to Colorado State, our department, and the entire campus community.

The Department of Mathematics is hosting a retirement party in December of 2008 to honor a number of recent retirees from our department.

WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

Colorado State students performed impressively in the William Lowell Putnam Mathematical Competition held in December 2007. Students compete in this national competition by sitting two exams, containing a total of twelve problems. The problems are notoriously difficult: of the roughly 4000 students who enter the competition nationally, typically only a third get a score above zero.

This year six Colorado State students entered the Putnam competition. Congratulations to

Benson Joeris, Andreea Erciulescu, Jonathan Troup, and Jennifer Jones who all successfully solved at least one problem. Benson Joeris was also the equal 3rd highest placed student in the state of Colorado; we wish him well as he heads to Cambridge University in England in the fall to take up a studentship for graduate studies in mathematic.

The Colorado State Putnam competition team was coached by Justin Sawon.

TIM WILDEY 2008 MELOSH MEDAL FINALIST



Dr. Tim Wildey

Dr. Tim Wildey, a 2007 Ph.D. graduate in mathematics, was named as a finalist for the 2008 Melosh Medal for the Best Student Paper in Finite Element Analysis. The Competition was inaugurated in 1989 to honor Professor Melosh, a pioneering researcher in finite element methods and former chairman of Civil and Environmental Engineering at Duke University.

Dr. Wildey's Ph.D. co-advisors were Professors Don Estep and Simon Tavener. Tim is currently an ICES Postdoctoral Fellow at the University of Texas in Austin.

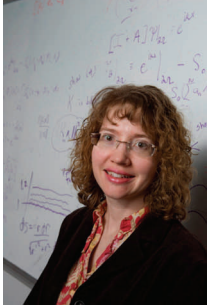
2008 ANNUAL FACULTY RETREAT HELD AT TAMASAG

Department Chair, Simon Tavener, held his annual faculty retreat at Tamasag on May 21st. The retreat gave faculty the opportunity to discuss the basic goals of the department for the coming academic year, including future hiring plans, proposed code changes, and the upcoming departmental external review. ISTeC, 2008 Math Day, and the Distinguished Alumni Award were also discussed.

The 2008-09 executive committee election results were also announced. The new executive committee comprises Gerhard Dangelmayr, Donald Estep, Rachel Pries and Daniel Rudolph.

Graduate director, Jeanne Dufлот, and undergraduate director, Gerhard Dangelmayr, each updated the faculty on the current goals of their committees and their focus for next year. Donald Estep briefly addressed the faculty concerning PRIMES, FEScUE, and CIMS. Daniel Rudolph, Paul Kennedy and Rachel Pries also presented a short discussion on NSF VIGRE-MCTP.

DR. JENNIFER MUELLER VISITING PROFESSOR AT ELECTRICAL IMPEDANCE TOMOGRAPHY LABORATORY IN SAO PAULO, BRAZIL



Professor Jennifer Mueller

Each day at the Electrical Impedance Tomography Laboratory in the Department of Mechanical Engineering at the University of Sao Paulo (USP), Brazil, physicians and engineers, graduates and undergraduates are working together to advance a technique for heart and lung imaging from electric fields. For the spring semester of 2007, USP was also home to CSU mathematics professor Jennifer Mueller.

Electrical impedance tomography (EIT) is a relatively new imaging technique in which electrodes are placed on the surface of the body, a low-amplitude current is applied on the electrodes, and the resulting voltages are measured. An inverse problem is solved to determine the conductivity distribution in the interior, and the results are plotted to form an image. One advantage of EIT is that it serves as a visualization of regional organ function and has very good resolution in time. Patients with ARDS (acute respiratory distress syndrome) have collapsed alveoli, or airways, in the lungs. The treatment for this condition is mechanical ventilation, which reinflates the airways over time. Eventually, the patient recovers and can be weaned from the ventilator. However, alveolar collapse, cyclic closing and reopening of the airways, and lung over-distention are dangerous side effects of mechanical ventilation that can be prevented by choosing the proper settings for the ventilator.



Dr. Raul Gonzalez-Lima and Dr. Julio Aya in the electrical impedance imaging lab at USP in Sao Paulo, Brazil

Mathematics plays a very central role in EIT technology, both in questions of system design and the development of reconstruction algorithms for solving the inverse problem. Professor Mueller has been working in EIT for the past 10 years, and first met the USP group at the First Mummy Range Workshop in EIT at the Pingree Park campus of CSU in 2002. Her decision to collaborate with the Sao Paulo group on site was motivated by her desire to contribute to the field in a practical manner. "I love EIT," Mueller said. "There are deep mathematical problems and simultaneously a developing technology that can save lives. I like to see an idea through from the theoretical to the practical aspects."



Ph.D. students Miguel Vallejo and Natalie Herrera will be visiting from the University of Sao Paulo

Professor Jennifer Mueller is co-advising the Ph.D. theses of two University of Sao Paulo students in EIT. Both Miguel Vallejo and Natalia Herrera plan to spend the 2008-2009 academic year in residence at Colorado State this fall.

Sidebar notes:

Acute Respiratory Distress Syndrome (ARDS)

- * ARDS is a life-threatening condition in which inflammation of lungs and fluid in the air sacs (alveoli) lead to low blood oxygen levels
- * Death rate is 20 to 30% and survivors often suffer permanent lung damage, memory loss, or other brain damage

* Treatment is mechanical ventilation through an endotracheal tube delivering high concentrations of oxygen at a continuous pressure

* Side effects of treatment include ventilator-induced pneumonia and lung damage

University of Sao Paulo

* Located in Sao Paulo, Brazil, a city of 18 million people and the largest city in the southern hemisphere

* The only tuition-free university in Brazil

* The EIT group in Brazil recently received the nationwide Werner von Siemens Award 2006, first prize on Innovative Technologies.

HILARY SPRIGGS UNDERGRADUATE FACILITATOR



Hilary Spriggs

During the previous two years, the Department of Mathematics Chair, Simon Tavener, has created a new administrative professional position to assist the department chair and associate chair with their duties. The position of Undergraduate Facilitator has been filled by Hilary Spriggs.

Hilary is an alumnus of our department, earning both her undergraduate and MS degrees from CSU. Previously, she worked for the department as an instructor and was selected and promoted to her current position in 2006.

Hilary's current duties include Ram Welcome, undergraduate advising, coordinating MATH130, and assisting faculty with RamCT and ARIESWeb. She teaches two courses per semester. In addition, Hilary generates initial teaching and class schedules and organizes room schedules and graders.