

MATHEMATICS

University honors alumnus for leadership

St. Cloud State University honored Joel Goergen with the 2007 College of Science and Engineering Leadership Award. The award had not been bestowed since 2005.

Goergen graduated in 1986 with B.S. degrees in math and electrical engineering. (See p. 22)

Sabbatical results in five overseas presentations

Professor Jeff Chen returned to teaching in fall 2007 after a year's sabbatical in which he studied the history of trigonometry in China (1580 – 1880) as well as the general history of Chinese sciences and mathematics. Included in the scope of his studies was Dai Zhen, the 16th-century Chinese scholar of the Qing Dynasty who made numerous contributions to mathematics, geography, phonology and philosophy.

The sabbatical began in September 2006, when Chen relocated to Beijing to become a visiting scholar at the Institute of the History of Natural Science. Then, in April 2007, he left China for the United Kingdom, where he continued his studies as a Mellon fellow at the Needham Research Institute at the University of Cambridge.

While on sabbatical, Chen presented the following:

- "Figures in the Proofs." 12/1 – 5/2006, Inner Mongolia Normal University, Hohhot, Inner Mongolia, China.
- "The Systematization in Dai Zhen's Mathematics Treatise." 12/19/2006, The Institute of History of Natural Science, Beijing, China.
- "The Integration and Systematization of Dai Zhen's Mathematics." 3/3 – 7/2007, Tianjing Normal University, Tianjing, China, and 3/20/2007, Tsinghua University, Beijing, China.
- "Proofs Without Words in 17th – 18th Century China." AMS-MAA special session of the History of Mathematics 2007 Joint Mathematics Meeting, 1/8/2007, New Orleans.
- "Chinese (Dai Zhen's) Measuring Units for Circles." Needham Research Institute, 6/16/2007, University of Cambridge, UK.

Classroom activity featured in journal

"Creating and Exploring Simple Models" by Associate Professor Miles Hubbard was published in the October 2007 *Mathematics Teacher*.

The article features a classroom activity used in Math 196 (formerly Mathematical Thinking and Modeling): A ball is dropped and height data is collected with a Texas Instruments calculator. Students find linear relationships

hidden in the data and use algebraic and statistical methods to derive an equation that models the height and velocity of the ball. A method is found for determining the distance the ball has fallen from velocity data, and that is extended to show why a quadratic model seems best for the original height data. *Mathematics Teacher* is a publication of the National Council of Teachers of Mathematics.

Co-teaching becomes conference topic

Professors Bishnu Naraine and Roozbeh Vakil received Teacher Quality Enhancement (TQE) grants to co-teach Math 432: Professional Subject Matter for Secondary School Mathematics in spring 2006 and spring 2007. The grant provided reassigned time for Vakil in 2006 and Naraine in 2007.

In reviewing the literature on co-teaching, the instructors found very little evidence of this type of collaboration in a methods (pedagogy) course in mathematics. They presented their experiences at a meeting of the 19th International Conference on College Teaching and Learning in April, 2008, in Jacksonville, Fla. A supplementary TQE covered their registration fees.

Department participates in S2S program

Professor Dan Scully oversees the department's initial foray into St. Cloud State University's Senior-to-Sophomore Program (S2S). An effort of the Center for Continuing Studies, S2S facilitates partnerships between college departments and high schools to enroll eligible students in introductory college-level courses on their own campuses.

Scully is mentoring collaborating high school math teachers at Sauk Rapids High School, Milaca High School and St. Cloud's Apollo High School during the 2007 – 2008 academic year. The course is Math 112, College Algebra.

Colloquium topics have popular appeal

The evolution of mathematics and its cultural contexts, how to cope with math test anxiety, "fuzzy" logic and fractals are among the topics being presented during the 2007 – 2008 Mathematics Colloquium.

The one-hour sessions, which are held in the Engineering and Computing Center, are free and open to the public and include refreshments. For more information, go online to www.stcloudstate.edu/math/activities/colloquium.asp

Keith M. Agre, Associate Professor. Ph.D. 2000, University of Nebraska at Lincoln.

hyperbolic partial differential equations

Publications

Agre, Keith M. and N. C. Fiala. Searching for the Shortest Single Axioms for Groups of Exponents. *Journal of Automated Reasoning* 36 (3) 241 – 257.

Agre, Keith M. and M. A. Rammaha. Systems of Nonlinear Wave Equations with Damping and Source Terms. *Differential and Integral Equations* 19 (11) 1235 – 1270.

Mohammed Bahauddin, Professor. Ph.D. 1969, New Mexico State University.

applied mathematics, mathematical modeling

Gary D. Buls, Professor. Ph.D. 1986, Iowa State University of Science and Technology.

discrete computational structures, numerical analysis

Dale Buske, Professor. Ph.D. 1997, Iowa State University of Science and Technology.

algebra, analysis

Selected Presentations

Buske, Dale. Lingo ... It's Not Just Words. Wisconsin MAA Section Meeting, April 20, 2007, Eau Claire, Wis.

Buske, Dale. Change the Constitution? Ya, You Bet'cha. Nov. 21, 2006, Concordia University, St. Paul, Minn.

Publications

Buske, Dale. Student Resource Guide, 6/E for Excursions in Modern Mathematics, 6/E, Prentice Hall, 2007. ISBN: 9780131873827.

Buske, Dale. Instructor's Resource Manual, 6/E for Excursions in Modern Mathematics, 6/E, Prentice Hall, 2007. ISBN: 9780131873810.

Ralph W. Carr, Professor. Ph.D. 1977, University of Wisconsin-Madison.

computer science, differential and integral equations

Jeff Chen, Associate Professor. Ph.D. 1996, Yale University.

automorphic form, coding theory, history of mathematics, nonabelian harmonic analysis, number theory, representation theory

Publications

Chen, Jeff. The $n \times (n - 2)$ Local Converse Theorem for $GL(n)$ over a p -adic Field. *Journal of Number Theory* 120 (2) 193 – 205.

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Nick C. Fiala, Associate Professor. Ph.D. 2002, The Ohio State University.

algebraic combinatorics

Publications

Agre, Keith M. and N. C. Fiala. Searching for the Shortest Single Axioms for Groups of Exponents. *Journal of Automated Reasoning* 36 (3) 241 – 257.

Sonja L. Goerdts, Professor. Ph.D. 2007, University of Minnesota.

mathematics education

Susan Haller, Professor. Ph.D. 1997, University of Minnesota.

education, mathematics

Danrun Huang, Professor. Ph.D. 1992, University of Maryland-College Park.

ergodic theory, functional analysis, matrix theory, symbolic dynamics, topological dynamics

Miles Hubbard, Associate Professor. M.S. 1986, St. Cloud State University.

climatology, collaborative learning groups, dynamical systems, micrometeorology

Publications

Hubbard, Miles. "Creating and Exploring Simple Models" *NCTM Mathematics Teacher* 101(3) 193.

Sandra Johnson, Associate Professor. M.Ed. 1970, University of North Dakota.

assessment in mathematics, mathematics preparedness for college

Ravindra Nath Kalia, Professor. Ph.D. 1972, University of Lucknow, India.

fractional calculus, integral transforms and equations

Publications

Dhage, B.C. and R. N. Kalia. (1-STCS) A Hybrid Fixed Point Theorem in Banach algebras with applications. (English. English summary) *Comm. Appl. Nonlinear Anal.* 13 (1) 71 – 84.

Kalia, R. N. and Ram U. Verma. H-monotone Nonlinear Variational Inclusion Systems. *Nonlinear Funct. Anal. & Appl.* 11 (2) 195 – 200.

Sandra Zaroodny Keith, Professor. Ph.D. 1971, University of Pennsylvania.

algebra, assessment, writing

Bishnu Naraine, Professor. Ph.D. 1989, The Ohio State University.

mathematics education, technology

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Daniel J. Scully, Professor. Ph.D. 1988, Utah State University.

discrete mathematics, linear algebra, modern algebra

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Roozbeh Vakil, Professor. Ph.D. 1992, Kansas State University.

mathematics education

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Stephen Walk, Associate Professor. Ph.D. 1999, University of Notre Dame.

computability theory, many-valued logic, mathematical logic

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Peiyi Zhao, Professor. Ph.D. 1990, University of Iowa.

geometry, graph theory, topology

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University notes passing of administrative pioneer

Louisa H. Johnson, former mathematics professor who was also dean of the College of Science and Technology (COST, now College of Science and Engineering) from 1984 to 1990, passed away June 22, 2007. She was 79.

At the time of her retirement, a colleague paid tribute to Johnson's "strength and resilience and ... sense of adventure. None of us can appreciate quite what it was like to be the lone woman administrator in a very male system."

Her tenure at St. Cloud State University began in the Department of Mathematics, where she taught for 13 years. Later, she served as Dean of Liberal Arts and Sciences, and, from 1984 until her retirement in 1990, she was dean of COST.

As dean, Johnson oversaw the establishment of the computer science, criminal justice, earth sciences and electrical engineering departments.

The mass communications programs earned its first accreditations while she was dean of Liberal Arts and Sciences, and the computer science and electrical engineering programs earned their first accreditations while she was dean of COST.

Johnson earned a B.A. from Augsburg in 1949, an M.S. from the University of Northern Colorado in 1961, a second M.S. from the University of Illinois in 1963 and a Ph.D. from the University of Northern Colorado in 1971.

Johnson was honored as Professor of the Year in 1966, received the Augsburg College Distinguished Alumni Award in 1974, and the University of Northern Colorado Distinguished Alumni Award in 1991. She was awarded a lifetime membership in the Minnesota Council of Teachers of Mathematics in 1993. 🐾

