

FACULTY newsletter

CPMS Physical and Mathematical Sciences



Math Dept

ABOVE Dr. David Cardon

Math Prof Honored with Teaching Award

Professor David Cardon received the Savage Teaching Award from the BYU Department of Mathematics in October this year for his outstanding teaching and contributions to the department.

The Savage Teaching Award was established in 2005 by a gift from Carolyn Savage Wright and the Kenneth and LaRae Savage Foundation. It honors top professors for excellence in the classroom and dedication to the Department of Mathematics. Dr. Cardon is the seventh recipient of the Savage Teaching Award.

"I'm grateful to the Savage Foundation," Cardon said. "It's nice to be recognized for having put forth a lot of effort over the years."

Dr. Cardon has been at BYU for 13 years and currently teaches calculus and real analysis. Cardon earned his PhD in 1996 from Stanford in mathematics. He credits his ability to succeed in

the classroom to his preparation for and excitement towards mathematics.

"I've put a lot of time into preparing for class and thinking about how to explain things and planning how to organize the class," Cardon said. "I think that's really the key. There's no one thing by itself that will make a class go well. A good class is the combination of many small efforts."

Cardon continues to utilize the teaching methods that he has employed throughout his career, but he recognizes that each class is a little bit different. Cardon molds his teaching methods around his personality and focuses on making the proper teaching adjustments to help his students succeed.

"I've just had to find what works for me," Cardon said. "I do feel quite excited about the material we're covering most of the time, and I think that's important."

by: Chris Scheitinger



Chem Dept

ABOVE Dr. James Patterson

Not Just for Looks: New Gold Mirrors Aid Investigation of Chemical Separations

Take a paper towel and dip the edge into water that is laced with colored dye. As the thin fibers of the towel soak up the mixture, the water and the dye separate – the further from the original point of saturation, the darker the color.

This basic experiment illustrates the process of chemical separation. Chemists use similar, albeit more complicated, procedures to analyze chemicals.

Professor James Patterson, of the Department of Chemistry & Biochemistry, said chemical separations are important in many areas of science.

"Chemical separation is a very big deal," he said. "Anytime you want something to have a certain level of purity, you have to separate out the compounds you don't want. Separations can be used in pharmaceuticals, fine chemicals, cosmetics – everything has

some aspect of separation."

Although separations are pervasive in the chemical industry, the fundamentals of molecular mechanisms are not fully understood.

"We have a general understanding, but you still have to go through and do optimizations – that takes time," Patterson said. "Right now, if you want to separate something, you have to run various standards and optimizations to figure out how to do it properly. It can take hours, and maybe even days, to get ready to do the separation you really want to do."

Patterson recently published an article showing that gold-backed mirrors with a chemical adhesion layer act as better reference materials than traditional mirrors – improving separation knowledge and efficiency.

continued on page 3.

Announcements

Jay McCarthy has been appointed to the Advisory Council for Library and Scholarly Communications. If you have any library-related requests, please contact him at 2-6350 or jay@cs.byu.edu.



Math Dept

ABOVE Dr. Jörg Thuswaldner

New Faculty Spotlight: Jörg Thuswaldner

The College of Physical and Mathematical Sciences welcomes Jörg Thuswaldner, a visiting faculty member in the Department of Mathematics.

Professor Thuswaldner grew up in Austria and studied technical mathematics at both the University of Salzburg and Graz University of Technology, where he earned his PhD. Thuswaldner enjoys studying fractal geometry and number theory. His research interests in topology led him to BYU.

"I like that [mathematics] is beautiful," he said. "I like beautiful theorems, especially number theory – things that are easy to state, but are very hard to prove. I like the mathematics behind many applications."

Five years ago, Thuswaldner contacted Dr. Greg Conner, a professor in BYU's Department of Mathematics. Conner's field of expertise related to what Thuswaldner was studying.

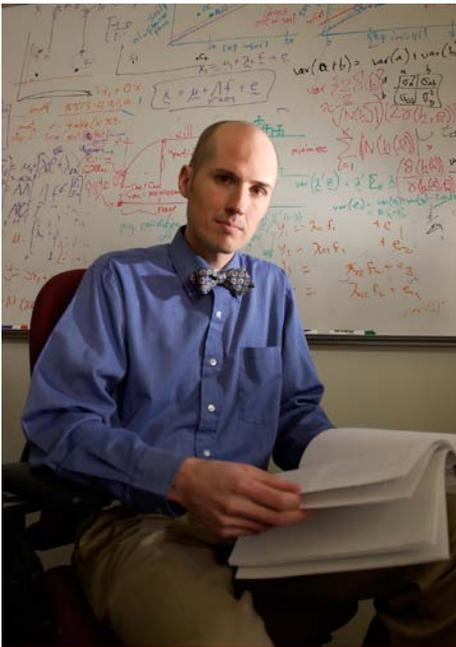
Thuswaldner and Conner began collaborating on research. When the opportunity became available, Thuswaldner decided to accept a position as a visiting professor at BYU.

Thuswaldner is currently teaching linear algebra and looks forward to writing new research papers during his time here.

"I have a lot of coworkers from all over the world, and I enjoy very much to travel and talk with people about mathematics all over the world," Thuswaldner said. "Mathematics is some kind of language that everybody can understand. It's uniting."

Thuswaldner is married and has two boys and one girl. In his free time, he enjoys fishing, reading and spending time with his family. He is enjoying his experience here in Utah, but he thoroughly misses quality Austrian bread.

by: Chris Scheitinger



BYU Photo

ABOVE Dr. William Christensen

New Associate Chair in Statistics Department

Serving in a university leadership position is no easy task. Yet someone has to do it. Though these positions are challenging, many CPMS professors add university service to their already heavy loads so that the departments can continue running smoothly.

William Christensen is no different. Dr. Christensen has been appointed as the new associate chair in the Department of Statistics. Though still learning, he's beginning to tackle some of the problems facing his department.

"One of the opportunities and challenges is that our enrollments are up about fifty percent in the last five years in terms of declared majors. But our resources haven't changed," he said. "Fortunately, it's a welcome problem that I think a lot of the departments in our college are having right now."

In addition to this issue, the department is working hard to maintain a welcome social environment and to connect students with careers. Christensen believes that solutions to these problems will require good ideas from everyone involved.

"There's no one person that's going to be able to solve these problems in our college," he said. "We all need to be thinking about how we scale up without losing the character of what

we've provided in our department and our college. And I think it's going to take more than the creativity of a few people in a department to be thinking about that."

In addition to his new appointment, Christensen will continue teaching and researching. His current research is in environmental statistics, a natural outgrowth of his graduate research in multivariate statistics.

"I work in building statistical models for understanding the origin and fate of pollutants," he said. "I've begun to be a little bit more involved in problems involving climate, ancient climate, and climate change. So, I'm interested in that which is a real hot [topic]. . . . And I'm personally interested in the environment and conservation, so doing something for a living that matches some of my personal interests and priorities is nice."

He even shares his interest in the environment with his six children by spending time outdoors.

"Rock climbing is a big deal for our family," he said. "We do a lot of rock climbing."

by: Katie Pitts

College Grants

Computer Science

[Chuck Knutson](#)

Sponsor: Verizon Foundation

Title: Internet Safety Project

Dates to Remember

College Christmas Luncheon

Friday, Dec. 9, 11:30 a.m.

ESC Pendulum Court

College Award Nominations

Due Wednesday, Jan. 11 to college

SRC Abstract Submissions Open

<http://src.byu.edu>

Monday, Jan. 16

University Faculty Award

Nominations

Due Wednesday, Jan. 18 to college

Annual Awards Banquet

Thursday, Jan. 19, 6 p.m.

WSC Ballroom

Izatt-Christensen Lecture

Tuesday & Wednesday, Feb. 7 & 8

James Patterson continued from page 1

In order to fully understand chemical separations, chemists need to look at the interface – the boundary between the solid support and the liquid – and understand the processes that take place there. Patterson's mirrors act as models, allowing chemists to better measure interface conditions.

"In order to interpret and properly analyze the [interface] data, we needed a reference at the place where the chemical separations are taking place," he said.

Using the mirrors as a reference, Patterson is now better able to measure the arrangement and orientation of molecules at the interface. This analysis then allows chemists to predict proce-

dures and design more effective separation mechanisms.

Acting as a correct reference, the new mirrors could potentially save time, money and materials. Patterson said that with a detailed understanding of what's happening at the molecular level, chemists could, in principle, know what conditions are needed before they start the separation process.

"We now have a reference we can trust," he said.

by: Stacie Carnley

College Publications

Chemistry and Biochemistry

[L. Hansen](#), [G. Fellingham](#), D. Russell. "Simultaneous Determination of Equilibrium Constants and Enthalpy Changes by Titration Calorimetry: Methods, Instruments, and Uncertainties", *Analytical Biochemistry*, 2011, volume 409/issue 2, pp. 220-29

Computer Science

[D. Embley](#), M. Krishnamoorthy, G. Nagy, S. Seth, "Factoring Web Tables", *Proceedings of The Twenty-fourth International Conference on Industrial Engineering and Other Applications of Applied Intelligent Systems*, 2011, pp. 253-263

[D. Embley](#), S. Liddle, D. Lonsdale, "Conceptual Modeling Foundations for a Web of Knowledge", *The Handbook of Conceptual Modeling: Theory, Practice, and Research Challenges*, 2011, pp. 40

[D. Embley](#), S. Liddle, D. Lonsdale, "Principled Pragmatism: A Guide to the Adaptation of Ideas from Philosophical Disciplines to Conceptual Modeling", *Proceedings of the ER 2011 Workshop on Ontologies and Conceptual Modeling*, 2011, pp. 10

[D. Embley](#), S. Liddle, D. Lonsdale, S. Machado, T. Packer, J. Park, N. Tate, A. Zitzelberger, "Enabling Search for Facts and Implied Facts in Historical Documents", *Proceedings of the International Workshop on Historical Document Imaging and Processing*, 2011, pp. 8

[D. Embley](#), S. Liddle, D. Lonsdale, Y. Tijerino, "Multilingual Ontologies for Cross-Lan-

guage Information Extraction and Semantic Search", *Proceedings of the 30th International Conference on Conceptual Modeling*, 2011, pp. 14

[D. Embley](#), S. Liddle, C. Tao, "A Web of Knowledge: A Conceptual-Modeling Perspective", *Dagstuhl Conceptual-Modeling Seminar Book*, 2011, volume 6520, pp. 24

[D. Embley](#), S. Liddle, O. Pastor, "Conceptual-Model Programming: A Manifesto", *The Handbook of Conceptual Modeling: Theory, Practice, and Research Challenges*, 2011, pp. 14

[D. Embley](#), W. Mok, "Mapping Conceptual Models to Database Schemas", *The Handbook of Conceptual Modeling: Theory, Practice, and Research Challenges*, 2011, pp. 41

G. Nagy, S. Seth, [D. Embley](#), M. Krishnamoorthy, D. Jin, S. Machado, "Data Extraction from Web Tables: The Devil Is in the Details", *Proceedings of the 11th International Conference on Document Analysis and Recognition*, 2011, pp. 5

Mathematics

D. Futer, E. Kalfagianni, [J. Purcell](#), "Slopes and Colored Jones Polynomials of Adequate Links", *Proceedings of the American Mathematical Society*, 2011, volume 139/issue 5, pp. 1889-96

Statistics

C. Calder, [C. Berrett](#), T. Shi, N. Xiao, D. Munroe, "Modeling Space-Time Dynamics

of Aerosols Using Satellite Data and Atmospheric Transport Model Output", *Journal of Agricultural, Biological, and Environmental Statistics*, 2011, volume 16/issue 4

[L. Hansen](#), [G. Fellingham](#), D. Russell. "Simultaneous Determination of Equilibrium Constants and Enthalpy Changes by Titration Calorimetry: Methods, Instruments, and Uncertainties", *Analytical Biochemistry*, 2011, volume 409/issue 2, pp. 220-29

L. Long, [W. Christensen](#), "Does the Readability of Your Brief Affect Your Chance of Winning an Appeal?—An Analysis of Readability in Appellate Briefs and Its Correlation with Success on Appeal", *Journal of Appellate Practice and Procedure*, 2011, volume 12/issue 1

A. Mooney, L. Kelsey, [G. Fellingham](#), J. George, R. Hager, J. W. Myrer, P. Vehrs. "Assessing Body Composition of Children and Adolescents Using Dual-Energy X-Ray Absorptiometry, Skin-Folds, and Electrical Impedance", *Measurement in Physical Education and Exercise Science*, 2011, volume 15/issue 1, pp. 2-17

R. Nielson, P. Vehrs, R. Hagar, K. Prusak, [G. Fellingham](#), "Step Counts and Energy Expenditure as Estimated by Pedometry During Treadmill Walking at Different Stride Frequencies", *Journal of Physical Activity and Health*, 2011, volume 8/issue 7, pp. 1004-13