

FACULTY newsletter

CPMS Physical and Mathematical Sciences



Kowallis Becomes New CPMS Associate Dean

Bart J. Kowallis has accepted an appointment by Academic Vice President John S. Tanner as associate dean in the College of Physical and Mathematical Sciences at Brigham Young University effective July 1, 2009. He replaces Dana T. Griffen who retires on August 31st.

Dr. Kowallis completed an undergraduate degree in geology at BYU in 1977. He completed his graduate work at the University of Wisconsin-Madison in 1981 receiving M.S. and Ph.D. degrees. He joined the BYU Department of Geology in 1982 teaching classes in Physical Geology, Structural Geology, Field Geology, and Physical Science. His research and

publications focus on geochronology, stratigraphy, and structural geology, particularly of the Mesozoic rocks in Utah. Dr. Kowallis served as Chair of the department from 1996-2002.

Since 2001, Dr. Kowallis and his students have mapped along the south and north flanks of the Uinta Mountains in cooperation with the Utah Geological Survey and United States Geological Survey. He is a Fellow of the Geological Society of America and was honored by Brigham Young University in 1986 with an Alcuin General Education Teaching Award and in 2003 with a Karl G. Maeser General Education Professorship.



Math Professor Receives Prestigious NSF Award

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Humpherys, an assistant professor in the Department of Mathematics, was awarded an NSF CAREER Award in June for his teaching and research. He said he did not expect to win the grant when he submitted his proposal.

"The CAREER Award is a prestigious grant that goes to young professors, usually the best and the brightest," he said. "Most people who get it went to MIT and schools like that. It really favors up-and-comers. I thought I maybe had a one percent chance of getting it."

Humpherys said he tried to focus on BYU's best qualities in his grant proposal; namely, the students and the unique opportunities presented to them by the university.

"I really focused on the education and teaching aspect of BYU," he said. "BYU has an advantage in mentoring and teaching. We're the best in the business. Other places don't do this like we do."

CAREER Award applications are generally focused on the research of the candidate. However, Humpherys decided not to go that route, instead opting to pitch his research in concert with the university's Interdisciplinary Mentoring Program in Analysis, Computation and Theory (IMPACT) as his biggest selling point.

Though IMPACT has only existed for a couple years, Humpherys said both NSF and other universities are beginning to take notice. The mentoring program, which pairs students with professors to perform research and get hands-on experience, is great for the participating undergrads and will be even better as more graduate students are recruited to fill supervisory roles as they conduct their own research.

"We want more graduate students," Humpherys said. "If we can recruit grad students to come and help teach and mentor the undergrads, then we can mentor more students than if the professors did all the mentoring on their own. We could mentor five times as many students."

Some universities across the country

ABOVE Humpherys hopes to use increased funding to recruit top graduate students to BYU.

Geological Sciences

Dorais, M.J., Wintsch, R.P., Nelson, W.R., and Tubrett, M.. (2009) Insights into the Acadian orogeny, New England Appalachians: A provenance study of the Carrabassett and Kittery formations Maine. *Atlantic Geology* 45, 50-71.

Mathematics Education

Walter, J. G., Hart, J. M., & Gerson, H. (2009). Student motivations for mathematical understanding in an inquiry-based calculus classroom. *Proceedings for the Twelfth Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education*, Raleigh, NC, February 26-March 1, 2009.

Walter, J. G., Houghtaling, E., & Gerson, H. (2009). The influence of risk taking on student creation of mathematical meaning. *Proceedings for the Twelfth Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education*, Raleigh, NC, February 26-March 1, 2009.

Physics and Astronomy

Jason D. Sagers, Timothy W. Leishman, and Jonathan D. Blotter, "A double-panel active segmented partition module using decoupled analog feedback controllers: Numerical model," *Journal of the Acoustical Society of America* 125, 3806-3818 (2009).

D Lerch, O Wieckhorst, G L W Hart, R W Forcade and S Muller, "UNCLE: a code for constructing cluster expansions for arbitrary lattices with minimal user-input", *Modelling Simul. Mater. Sci. Eng.* 17 (2009) 055003 (19pp)

Statistics

Guthrie, W.S., Crane, R.A., and Eggett, D.L., "Statistical Comparison of Mechanistic-Empirical Models for Predicting Fatigue Life of Cement-Treated Base Layers Over Weak Subgrades," *Proceedings of the American Society of Civil Engineers Fourteenth International Specialty Conference on Cold Regions Engineering*, Duluth, MN, (2009).

Humpherys *continued*

are considering adopting the IMPACT model. Humpherys said he thinks much of the interest has been generated not just by the program's success and excellence, but by a rising fear that the United States is being outstripped by its foreign counterparts in math and science.

"NSF has a lot of things it tries to do, but national competitiveness in math and science is paramount," he said. "Right now our country is moving in the wrong direction and that's a big problem. What happens when China

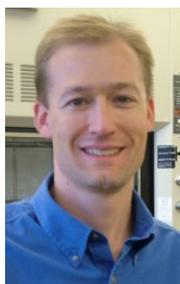
has a better fighter jet? What happens when more countries has nuclear capabilities? The government senses that we'll be in trouble. But as long as we can retain our dominance in science, technology, engineering and mathematics, we'll continue to be a superpower and be able to sustain our way of life."

CAREER Awards are presented on a yearly basis to young professors in a number of scientific and mathematical disciplines. The grant is funded by the National Science Foundation and is the foundation's most prestigious award for junior faculty.

by: Steve Pierce

Total Synthesis Of Complex Compound Achieved

A BYU research group has reached a breakthrough in its study of a complex chemical compound, an accomplishment that is already garnering significant respect from the scientific community.



Dr. Steven L. Castle, an associate professor in the BYU Department of Chemistry and Biochemistry, and his research team recently completed the total synthesis of acutumine. The team also includes graduate student Fang Li and undergraduate student Samuel S. Tartakoff.

Acutumine, which comes from an Asian hanging vine, is often used in Chinese medicine to reduce pain and fever and has a unique structure. Castle said acutumine has anti-amnesic properties in rats, meaning that it can potentially restore memory loss in humans.

The process used to synthesize acutumine includes new chemical reactions that could be used by pharmaceutical companies to synthesize medicines, he said.

Unfortunately, due to the compound's complex structure, it took 42 years for someone to synthesize acutumine

following its discovery.

"The structure is so challenging that people weren't trying to make it until 8 or 9 years ago," Castle said.

Castle has been researching acutumine since 2003. Fang Li began his research in 2004. Their article, entitled "Total Synthesis of (-)-Acutumine," was published in the *Journal of the American Chemical Society* web site on April 28 and quickly skyrocketed into popular demand.

The paper ranked 7th on the *Journal of the American Chemical Society's* most-read papers list for April. The journal publishes more than 200 papers in any given month.

A summary of the article - and many positive reviews - can be found on a web site created by Oxford graduate Paul Docherty. Docherty, who started www.totallysynthetic.com in 2006, has summarized papers from many top universities, including Stanford, Harvard and MIT, on his site. Castle is pleased by the exposure that Docherty's site will offer BYU, his students, and their ongoing research.

by: Keri Lunt

Dean's Office Prepares To Say Farewell To Griffen

Associate Dean Dana T. Griffen will retire on September 1, 2009. He served in the CPMS Dean's Office for ten years and provided an array of invaluable skills and talents to the college. Griffen and his wife, Berva, now plan to serve a full-time mission for the LDS Church. The CPMS staff thanks him for his service and wishes him the best of luck with his future endeavors.

