

FACULTY newsletter

CPMS Physical and Mathematical Sciences



Haley Frame

ABOVE Service award recipients, from left to right: Jim Logan, Freeman Anderson, Diann Sorensen, Lynn Patten, Klark Walker and Robert Paxman



Haley Frame

ABOVE College award recipients, from left to right: Wes Lifferth, John Lamb, David Embley, Ken Rodham and Summer Rupper



Bradley Slade

ABOVE Dr. Jacqueline Voyles and students

Service, Citizenship and Teaching Honored

Several faculty and staff from the College of Physical & Mathematical Sciences were honored at an awards ceremony during the annual college banquet on Thursday, January 19, in the Wilkinson Ballroom. The room was full of faculty, staff and their families, as attendees enjoyed a delicious meal and listened while Dean Sommerfeldt announced the award recipients.

First, Dr. Sommerfeldt announced the recipients of the University Service Awards, which are given based on length of service to the university. These awards were given to Freeman Anderson (30 years' service, Physics & Astronomy), Kathi Carter (10, Statistics), Kim Christensen (5, Chemistry & Biochemistry), Loren Harshbarger (5, Computer Science), Jim Logan (30, Mathematics), Lynn Patten (10, dean's office), Robert Paxman (10, Chemistry & Biochemistry), Diann Sorensen (25, Physics & Astronomy), and Klark Walker (15, Computer Science).

Sommerfeldt then announced the winners of the other college awards.

Computer science professor David Embley was awarded the Distinguished Citizenship Award in recognition of his extensive service to his department, the college and his professional community.

"David has always been a team player and a remarkable example of what true citizenship and loyalty to BYU means to all of his colleagues, young and old," said Sommerfeldt.

Summer Rupper, an assistant professor in the Department of Geological Sciences, received the college Young Scholar Award. Rupper began teaching at BYU in 2007 and has already made significant contributions to her disciplines of glaciology and climate change in her young career. She has published in the top journals in her field, and she was featured in BYU News for her analysis on glacial growth and retreat in Asia. Her courses on glaciology and climate are unique because they provide students the opportunity to work in local snow and ice projects.

Chemistry professor John Lamb was announced as recipient of the Outstanding

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Emeritus Prof Honored for Life's Work

Retired mathematics education professor Jacqueline Voyles considers herself lucky to have been able to observe and participate in the evolution of mathematics teaching over the past 44 years. Because of her dedication to improving mathematics teaching and curriculum over the years, she received the 2011 Don Clark Award for a Lifetime of Achievement and Excellence in Mathematics Education from the Utah Council of Teachers of Mathematics.

Voyles, now an emeritus teaching professor, taught mathematics and mathematics education for 44 years, 33 years of which were at BYU. She has taught all ages, from sixth graders to college graduates. Though curriculum and teaching styles change, Voyles has always had one goal in mind: to create and use a teaching environment

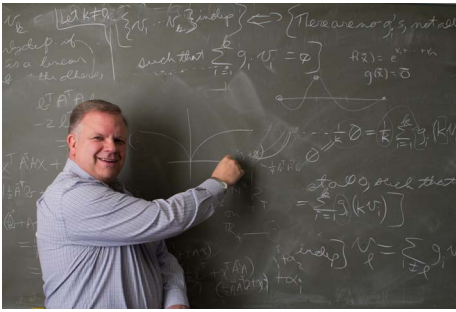
and curriculum that will help students truly understand math.

"From being on the founding faculty of a middle school, to co-founding and developing the BYU Math Lab, to participating in the creation of the Mathematics Education Department at BYU – I have ended up in circumstances that provided lots of freedom to develop programs, choose and develop curriculum, and to experiment with teaching," Voyles said.

Voyles always tried to take advantage of opportunities to help students and future teachers understand the importance of mathematics.

"In all of these situations, it seemed that opportunities to experiment and create just kept falling out of the sky, and I had the choice to do something about it or trip over it. I feel very

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Levi Price

ABOVE Dr. Robin Roundy

Robin Roundy Inducted as INFORMS Fellow

In November 2011, BYU mathematics professor Robin Roundy was inducted as a fellow in the Institute for Operations Research and the Management Sciences (INFORMS). The institute inducted Roundy for his research accomplishments in operations research and management sciences.

INFORMS is a distinguished operations research society devoted to applying scientific methods to advance operations and management functions. This area of study focuses on applying advanced analytical methods and mathematics to help organizations make beneficial decisions.

Roundy was specifically recognized for his innovative research in supply chain optimization and for his teaching and contributions to the field of operations research.

"It's a very nice thing," Roundy said. "In addition to being a nice thing, it opens doors for you and makes it easier to accomplish things that you want to accomplish."

Roundy's research has focused on supply chains and converting raw materials into finished goods. He has addressed such areas as forecasting demand, planning production, transporting materials and sequencing manufacturing operations in factories.

Roundy's excitement for operations research revolves around his ability to

see real-life applications of mathematics to the business community. Even though operations research is a relatively new field, its influence continues to expand.

By becoming a fellow with INFORMS, Roundy will positively impact the Mathematics Department and its scope.

"Whether this has a big impact on the math department, it will certainly increase the visibility of the Math Department," Roundy said. "It will increase the profile of the Math Department in the INFORMS community."

Roundy graduated from BYU with both a bachelor's and a master's degree in mathematics. He later earned his PhD in operations research at Stanford University, before becoming a professor at Cornell University. Roundy also served as a mission president before coming to BYU.

He is teaching optimization and linear algebra classes during the winter semester, while continuing his research.

"This career has given me the opportunity to do a lot of things that I really enjoy. I love research," Roundy said. "I love working with students in different contexts – both teaching and working with students on research. I also really enjoy working with companies, and this has given me the opportunity to do all of those things."

by: Chris Scheitinger

College Grants

Chemistry and Biochemistry

[Paul Farnsworth](#)

Sponsor: Bruker Corporation
Title: The Use of Laser-Induced Fluorescence to Study Ion Transmission

Physics and Astronomy

[Lawrence Rees](#)

Sponsor: U. of Michigan (Homeland Security)
Title: New Detectors, Electronics and Algorithms for Fast Neutron Spectroscopy

Correction

In the last edition of the newsletter, the article "Geology Breaks New Ground in Nauvoo" was incorrectly attributed. The author should have been listed as Jenny Spencer.

Life's Work continued from page 1

blessed to have been given so many chances to start from scratch – to think with my colleagues about what the end product of the learning should look like and then put our best ideas to work."

Voyles loves teaching all ages, but she especially enjoyed teaching mathematics education majors in the course just before they enter into their classroom practicum.

"I really enjoyed them – watching them put the math and the math education together in a package so they can go into the schools and student teach the very next semester."

Along with a passion for teaching, Voyles deeply loves mathematics. She believes math is a gateway to many interesting opportunities.

"Math opens doors to many choices of studies and careers," she said. "This knowledge provides a solid foundation for learning in other fields."

The award Voyles received is named for her friend and colleague, Don Clark, who played an important role in mathematics education in Utah for many years. Voyles feels grateful to have received such a prestigious award from her peers. The award reminded her that all the time and effort she put into helping students and future teachers has made a difference in some lives.

by: Jenny Spencer



Katie Pitts

ABOVE Dr. John McBride

Rediscovering Provo's First Tabernacle

Did you know the history of the Provo Tabernacle goes deeper than the burnt ruins above the surface?

In order to analyze the land surrounding the Provo Tabernacle, professors John McBride and Bill Keach, along with students from BYU's Department of Geological Sciences, have partnered with Emily Utt and Benjamin Pykles, historic sites curators in the Church History Department of The Church of Jesus Christ of Latter-day Saints.

Utt began documenting the tabernacle and its surviving architecture shortly after the fire in December 2010. She is currently investigating the history of the tabernacle site in order to understand the possibilities and problems surrounding the development of the new temple.

While researching the site, Utt discovered that an earlier tabernacle once existed near the current tabernacle. The old tabernacle, which was designed by the same architect as the Salt Lake Temple, was torn down in the early 1900s, and its exact location was unknown.

Determination of the exact location and architectural remains of the old tabernacle will provide valuable information while engineering and designing the foundation and developing the construction site of the future temple.

"I'm most excited for how much we've learned about the [Provo Tabernacle] and this site that we didn't know before," Utt said. "We know more about this [old] tabernacle now than anyone has known in the last 100 years."

Using Ground Penetrating Radar (GPR), professors McBride and Keach are currently investigating where the old tabernacle was built in comparison to the remains of the current Provo Tab-

ernacle. The GPR instrument is installed on a three-wheeled cart and acts as an antenna and receiver.

The GPR equipment sends electromagnetic waves into the ground, which reflect off the different layers and materials in the earth. GPR essentially allows you to see into the ground without digging into it.

"Our contribution is to actually show where [the old tabernacle] really is," McBride said. "It was challenging because the ground was kind of wet, and radar doesn't work very well with wet ground. Nevertheless, it actually did work very well so that was kind of a surprise."

The BYU Office of Public Archaeology has also been on-site, excavating and mapping portions of the old tabernacle's foundation. The limited excavations have confirmed what historical documents and the GPR survey indicated — that the old tabernacle's buried stone foundations are 4 feet wide and up to 5.5 feet high. Once the GPR data processing is complete, a final map will be produced, and Utt and Pykles will present it to Church headquarters.

"Our job is to report what we find, and then hopefully, we can weigh-in on what we think can happen to this place," Pykles said.

A big sycamore tree currently stands over the area where the old tabernacle's tower once existed.

"It's pretty amazing that people have been walking over this area and picnicking here and doing all sorts of things here and not understanding or knowing that they're standing on the remains of a one-hundred-and-fifty-year old tabernacle," Pykles said.

by: Chris Scheitinger



CS Dept

ABOVE Dr. Kent Seamons

Seamons on Reprogramming Future Security

Hackers. Every time you check your email, Google something or pay tuition, they are out there. But you probably would never expect them to be gathering on BYU campus, as well.

Department of Computer Science professor Kent Seamons advises the BYU hacking team, a group of students studying Internet security to help defend against hackers. The team recently won a national competition, and BYU Broadcasting's show, "Thinking Aloud,"

interviewed Seamons about the typical hacker profile. He describes the safest passwords, new innovations in Internet security and computer science ethics taught at BYU.

To listen to the interview online, visit classical89.org and enter "Seamons" in the search bar.

by: Alysa Hoskin

Dates to Remember

PDPs Due

Wednesday, Feb. 22

SRC Abstract Submissions

<http://src.byu.edu>

Due midnight, Friday, Feb. 24

Grad Fellowship Proposals Due

Wednesday, Feb. 29

Scholarship Applications Due

Thursday, March 15

Student Research Conference

Saturday, March 17, JKB

Showcase: 10 a.m. – 12 p.m.

Technical sessions: 8 a.m. – 1 p.m.

Annual Reports Due

Friday, March 30

Service, Citizenship and Teaching continued from page 1

ing Teaching Award (10+ years). Lamb pioneered the use of a variety of software tools in the classroom.

"John is a model of life-long learning and broad interests," said Sommerfeldt. "This is amply evident in his teaching and student interactions." Lamb has also held various leadership positions on campus since 1985, including director of research administration, executive director of research and creative work, and associate dean for general education.

The second faculty recipient of an Outstanding Teaching Award (<10 years) was Ken Rodham, from the Department of Computer Science. After seven years in Silicon Valley working on Internet applications and technologies, Rodham

began working at BYU. Since 2002, he has trained students as they developed strong software engineering skills, using his prior experience in the field of computer science.

Finally, Wesley Lifferth, a machinist/design engineer from the Department of Physics and Astronomy won the college recognition award for Outstanding Staff/Administrative Employee. Lifferth is called on to invent new tools, modify existing ones, manufacture small precision-machined parts and an array of other tasks. His contributions to the department have been innumerable.

Overall, the night was a memorable way to recognize the dedication and hard work of CPMS faculty and staff.

by: Alysa Hoskin

College Publications

Chemistry and Biochemistry

P. Aggarwal, [H. D. Tolley](#), [M. Lee](#), "Characterizing Organic Monolithic Columns Using Capillary Flow Porometry and Scanning Electron Microscopy", *Analytical Chemistry*, 2012, volume 84/issue 1, pp. 247-54

P. Aggarwal, [H. D. Tolley](#), [M. Lee](#), "Monolithic Bed Structure for Capillary Liquid Chromatography", *Journal of Chromatography A*, 2012, volume 1219, pp. 1-14

L. Bhuiyan, C. Outhwaite, [D. Henderson](#), "A Monte Carlo Study of the Structure of a Planar Electric Double Layer Containing Asymmetric Electrolytes", *Journal of Chemical & Engineering Data*, 2011, volume 56/issue 12, pp. 4556-63

R. Hilton, B. Zhang, L. Martineau, [G. Watt](#), [R. Watt](#), "Anion Deposition into Ferritin", *Journal of Inorganic Biochemistry*, 2012, volume 108, pp. 8-15

J. Lopez-Castro, J. Delgado, J. Perez-Omil, N. Galvez, R. Cuesta, [R. Watt](#), J. Dominguez-Vera, "A New Approach to the Ferritin Iron Core Growth: Influence of the H/L Ratio on the Core Shape", *Dalton Transactions*, 2012, volume 41/issue 4, pp. 1320-24

V. Mukhanov, [L. Hansen](#), R. Kemp, "Nanocalorimetry of Respiration in Micro-Organisms in Natural Waters", *Thermochimica Acta*, 2012, volume 531, pp. 66-69

S. Ness, S. Kim, [A. Woolley](#), G. Nordin, "Single-Sided Inkjet Functionalization of Silicon Photonic Microcantilevers", *Sensors and Actuators B: Chemical*, 2012, volume 161/issue 1, pp. 80-87

D. Walker, [H. Vollmer-Snarr](#), C. Eberting, "Ocular Hazards of Blue-Light Therapy in Dermatology", *Journal of the American Academy of Dermatology*, 2011, volume 66/issue 1, pp. 130-35

Computer Science

T. Andelin, V. Chetty, D. Harbaugh, [S. Warnick](#), [D. Zappala](#), "Quality Selection for Dynamic Adaptive Streaming over HTTP with Scalable Video Coding", *Proceedings of the ACM Multimedia Systems Conference*, 2012

J. A. Atherton, [M. Goodrich](#), "Supporting Clinicians in Robot-Assisted Therapy for Autism Spectrum Disorder: Creating and Editing Robot Animations with Full-Body Motion Tracking", *Human-Robot Interaction: Perspectives and Contributions to Robotics From the Human Sciences Workshop at Robotics Science and Systems*, 2011

J. A. Atherton, [M. Goodrich](#), "Visual Robot Choreography for Clinicians", *Proceedings of the Conference on Collaborative Technologies and Systems (CTS)*, 2011

B. Brinton, L. Robinson, M. Fujiki, A. Akeron, M. Hansen, M. Colton, [M. Goodrich](#), J. A. Atherton, D. Ricks, "Enhancing Social Engagement in Children with ASD: Using a Robot", poster at the Annual American Speech-Language-Hearing Association (ASHA), 2011

S. Burton, P. Bodily, R. Morris, [C. Knutson](#), J. Krein, "Design Team Perception of Development Team Composition: Implications for Conway's Law", *Proceedings of the 2nd International Workshop on Replication in*

Empirical Software Engineering Research (RESER 2011), 2011

R. Clawson, [W. Barrett](#), "Extraction of Handwriting in Tabular Document Images", *Family History Technology Workshop 2012 (FHTW2012@Rootstech)*, 2012, pp. 76-79

C. Christiansen, [W. Barrett](#), "Removing the Noise from Cemetery Headstones", *Family History Technology Workshop 2012 (FHTW2012@Rootstech)*, 2012, pp. 66-71

J. Crandall, A. Ahmed, [M. Goodrich](#), "Learning in Repeated Games with Minimal Information: The Effects of Learning Bias", *Proceedings of the Twenty-fifth AAAI Conference on Artificial Intelligence*, 2011

S. Fiore, N. Badler, L. Boloni, [M. Goodrich](#), A. Wu, J. Chen, "Human-Robot Teams Collaborating Socially, Organizationally, and Culturally", *Proceedings of the 2011 HFES Symposium - From Teleoperation to Teammate: Applying Theory and Method from the Cognitive and Computational Sciences to Create Human-Robot Teams*, 2011

[M. Goodrich](#), P. Sujit, B. Pendleton, J. Pinto, "Toward Human Interaction with Bio-Inspired Robot Teams", *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, 2011

D. Kennard, [W. Barrett](#), "Automatic 'Life Sketch' Videos", *Family History Technology Workshop 2012 (FHTW2012@Rootstech)*, 2012, pp. 117-19

D. Kennard, [W. Barrett](#), [T. Sederberg](#), "Handwriting Recognition (HR) of Family History Documents using a 2-D Warping-Based Word-Level HR Approach", *Fam-*

ily History Technology Workshop 2012 (FHTW2012@Rootstech), 2012, pp. 50-53

J. Krein, L. Pratt, A. Swenson, A. MacLean, [C. Knutson](#), [D. Eggett](#), "Design Patterns in Software Maintenance: An Experiment Replication at Brigham Young University", Proceedings of the 2nd International Workshop on Replication in Empirical Software Engineering Research (RESER 2011), 2011

J. Krein, P. Wagstrom, S. Sutton Jr., C. Williams, [C. Knutson](#), "The Problem of Private Information in Large Software Organizations", Proceedings of the International Conference on Software and Systems Process (ICSSP 2011), 2011, pp. 218-22

[M. Jones](#), "Branches and Roots: Project Selection in Graphics Courses for Fourth Year Computer Science Undergraduates", International Symposium on Visual Computing, 2011, volume 6939, pp. 249-58

A. MacLean, [C. Knutson](#), "Open Source: From Mythos to Meaning", Proceedings of the 7th International Conference on Open Source Systems (OSS 2011) Doctoral Consortium, 2011

A. MacLean, L. Pratt, [C. Knutson](#), [E. Ringger](#), "Knowledge Homogeneity and Specialization in the Apache HTTP Server Project", Proceedings of the 7th International Conference on Open Source Systems (OSS 2011), 2011, pp. 106-122

L. Pratt, A. MacLean, [C. Knutson](#), [E. Ringger](#), "Cliff Walls: An Analysis of Monolithic Commits Using Latent Dirichlet Allocation", Proceedings of the 7th International Con-

ference on Open Source Systems (OSS 2011), 2011, pp. 282-98

B. Ricks, [P. Egbert](#), "Graph-Based Global Illumination", Computer Graphics International, 2011

M. Smith, [T. Martinez](#), [C. Giraud-Carrier](#), "An Instance Level Analysis of Data Complexity", Machine Learning Journal

K. Sundberg, [M. Clement](#), [Q. Snell](#), [D. Ventura](#), M. Whiting, K. Crandall, "Partial Tree Mixing, a Novel Approach to Phylogenetic Search", Biotechnology and Bioinformatics Symposium (BIOT), 2011, pp. 1-4

Q. Taylor, J. Krein, A. MacLean, [C. Knutson](#), "An Analysis of Author Contribution Patterns in Eclipse Foundation Project Source Code", Proceedings of the 7th International Conference on Open Source Systems (OSS 2011), 2011, pp. 269-81

Geological Sciences

D. Sprinkel, [B. Kowallis](#), P. Jensen, "Correlation and Age of the Nugget Sandstone and Glen Canyon Group, Utah", Sevier Thrust Belt: Northern and Central Utah and Adjacent Areas: Utah Geological Association Publication 40, 2011, p. 131-49

D. Sprinkel, H. Doelling, [B. Kowallis](#), G. Waanders, P. Kuehne, "Early Results of a Study of Middle Jurassic Strata in the Sevier Fold and Thrust Belt, Utah", Sevier Thrust Belt: Northern and Central Utah and Adjacent Areas: Utah Geological Association Publication 40, 2011, pp. 151-72

A. McKean, [B. Kowallis](#), [E. Christiansen](#), "Kinematic Analysis of Northeast-Trending Faults of the Allens Ranch 7.5' Quadrangle, Utah County, Utah", Sevier Thrust Belt: Northern and Central Utah and Adjacent Areas: Utah Geological Association Publication 40, 2011, pp. 89-116

Mathematics

[J. Cannon](#), review of "Embeddings in Manifolds", Bulletin of the AMS, 2011, volume 48/issue 3, pp. 485-90

[X. Li](#), "Prolate Spheroidal Wave Functions, Sonine Spaces, and the Riemann Zeta Function", Journal of Mathematical Analysis and Applications, 2012, issue 389/volume 1, pp. 379-93

Statistics

P. Aggarwal, [H. D. Tolley](#), [M. Lee](#), "Characterizing Organic Monolithic Columns Using Capillary Flow Porometry and Scanning Electron Microscopy", Analytical Chemistry, 2012, volume 84/issue 1, pp. 247-54

P. Aggarwal, [H. D. Tolley](#), [M. Lee](#), "Monolithic Bed Structure for Capillary Liquid Chromatography", Journal of Chromatography A, 2012, volume 1219, pp. 1-14

J. Krein, L. Pratt, A. Swenson, A. MacLean, [C. Knutson](#), [D. Eggett](#), "Design Patterns in Software Maintenance: An Experiment Replication at Brigham Young University", Proceedings of the 2nd International Workshop on Replication in Empirical Software Engineering Research (RESER 2011), 2011



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