A Pattern of Excellence

Dr. John Lamb has been on the cutting edge of teaching ever since he got his start as a chemistry professor. He was one of the earliest implementers of technology in the classroom and developed ChemTutor, a multimedia tutorial for pre-lecture instruction with beginning chemistry classes.

For accomplishments like these, along with a full career of research and service to the university, Dr. Lamb has received this year’s Karl G. Maeser Distinguished Faculty Lecturer Award. This award is BYU’s most prestigious faculty award. The requirements include a minimum of five years at BYU and a demonstration of clear superiority in research and creative work, teaching, and university citizenship. With all these qualities, Dr. Lamb was an exceptional candidate.

Dr. Lamb has been at BYU since 1977, after getting both his bachelor’s degree and PhD from BYU in chemistry. He has published 172 papers in peer-reviewed journals and was the editor-in-chief of the Journal of Inclusion Phenomena and Macrocyclic Chemistry for 20 years. He has been a visiting lecturer at universities in both Italy and China. Dr. Lamb has received many other awards throughout his career, including the 2012 International Ion Chromatography Award in Berlin, Germany, the BYU Karl G. Maeser Excellence in Research and Creative Arts Award in 1996, and the BYU Outstanding Achievement in Sponsored Research Award in 1993.

“I’m thrilled and honored to be chosen, and I recognize that there are many other faculty members here who merit this honor at least as much as I,” said Dr. Lamb.

Dr. Lamb plans to continue in his pattern of excellence by finishing up several research papers and teaching a new batch of Chem 105 students this fall.

“I’m approaching retirement now after 36 years at BYU, but hope to continue activity in chemistry teaching into the future in a variety of ways. I love learning about the natural world and sharing what I have learned with others,” said Dr. Lamb.

by Caroline Smith
One Professor, Three Inventions

Many teachers invent new methods to reach out to their students. Dr. Charles Knutson of the Computer Science Department has helped his students invent new things to reach out to the public.

Three technical innovations, involving hundreds of students mentored by Dr. Knutson were licensed through the BYU Technology Transfer Office this past year.

Because of this, Dr. Knutson received the annual university Technology Transfer Award, which recognizes faculty who have made significant research contributions that have led to the development of useful commercial products.

“When you try to do research that can be commercialized, the question is whether it can be applied elsewhere,” said Dr. Knutson. “Are there customers who are going to benefit from this?”

The Poket Doctor project originated from Dr. Knutson’s work as Director of the Mobile Computing Laboratory in close collaboration with two graduate students, David Vawdrey and Eric Hall.

Their work led to a patent for a technology that dramatically extended battery life in a Bluetooth-enabled smartcard via the use of passive RFID tags. Their patent was licensed this past year to a UK company called TomTom International.

The 20-Minute Genealogist project originated in Dr. Knutson’s CS 428 Software Engineering course in Fall 2007 as a class project to create software that would enable an individual to make progress in their own family history work in as little as 20 minutes a week.

With the support of Dr. Daniel Zappala of the Computer Science Department and the involvement of several hundred students over the next five years, the 20-Minute Genealogist was released as a beta product in April 2012.

During the past year, the technologies (including one patent issued and two additional patents pending) were licensed to Kinpoint, Inc., a Utah County startup company now in its first round of funding.

The Internet Safety Project began as a podcast produced by students in Dr. Knutson’s CS 404 Ethics and Computers in Society course in Fall 2007. The following year a wiki was added to the podcast, and in October 2010 the site was expanded and rebranded as the Internet Safety Project. Its fundamental goal is to help educate parents, teachers, and teens about the benefits and risks of technology.

While incubating at BYU over five years, the Internet Safety Project grew to include the world’s most popular podcast on Internet Safety and the world’s largest wiki on Internet Safety.

The Internet Safety Project became an off-campus corporation this last year, acquiring the rights to the intellectual property created as a BYU project. In August 2013, Internet Safety Project, Inc. received 501(c)3 non-profit recognition from the United States government.

“You don’t set out to license three technologies in the same year, but things just seemed to come together,” remarked Dr. Knutson. “It’s satisfying to see the success of these projects, especially given the tremendous student involvement while they incubated at BYU.”

All research can be valuable. With Dr. Knutson’s inventions, we can see just how useful research can be.

by Curtis Penfold
Seeing the Lights Go On

David Dearden’s love for chemistry started small, beginning with a summer program for high school students at the University of Utah, where Dearden had the opportunity to be mentored by famous chemist Henry Eyring. “I didn’t know at all who he was,” Dearden said. “He gave a lecture to the class and I started asking questions. He spent a good half hour talking to me, a lowly high school student, after the class.”

Stemming from that experience, Dearden has made mentoring undergraduate students a large part of his career. For this focus, he was honored with an Alcuin Fellowship in General Education at the BYU Annual University Conference in August.

Dearden’s love for chemistry continued to grow as he became a freshman chemistry major at BYU, and his experience as a missionary further helped him narrow down his career choice. “I went on my mission and discovered I loved teaching; I loved seeing the lights go on. That’s where the idea of being a chemistry professor was born,” he said.

Dearden earned his bachelor’s degree in chemistry from BYU in 1983 and his PhD from the California Institute of Technology in 1989. After entering the world of academia and realizing he could now pursue research interests that were entirely his own, his passion for research and for teaching others how to do research grew even more.

“There is a big need right now for the general public to understand the importance of basic research. . . . You don’t get applications unless you do basic science, so I feel a real obligation to explain the importance of basic science to people,” he said.

As he strove to become a better teacher, Dearden said he was diligent about updating his teaching materials, trying new technology, and, more particularly, observing other teachers. “What has taught me more about teaching than anything I’ve ever done is watching people do it who are good at it,” he said. “Every time I get a new course . . . that someone else has taught, I try to go sit in on it and watch them teach it first.”

Dearden has been an Alcuin Fellow previously, between 2002 and 2005, during which he spent a great deal of time teaching undergraduate courses and co-authoring the textbook for the physical science 100 course, Physical Science Foundations.

This time around, Dearden plans to continue his research and undergraduate mentoring, as well as gain insights and share research with others by traveling to Australia to attend research conferences.

“I think it is important . . . to really deeply care about the students. . . . If that’s what’s motivating you, it gets you to work harder and make things clearer,” he said. “The way I see it, the research we do and the teaching we do really all fits together.”

by Meg Monk
Mathematics professor Michael Dorff has made helping students succeed the focus of his career. Founder and director of the Center for Undergraduate Research in Mathematics and the “Careers in Math” speaker series, Dorff was honored for his focus on student mentoring at the BYU Annual University Conference in August, where he received a University Teaching and Learning Fellowship.

“Teaching is great because you get to help mold people,” Dorff said, “as a teacher, you help light the fire of enthusiasm for your subject . . . but you also get to have a big influence in making your students into better people.”

During his undergraduate years as a math education major at BYU, Dorff wasn’t very excited about mathematics. He was good at math and liked the idea of being a teacher, but it wasn’t until he spent a few years teaching math at a high school that his passion for mathematics, and especially for teaching, was born.

“Having enthusiasm for what you’re teaching is one thing that helps make me a better teacher,” he said. “Even though I teach large calculus classes with about 250 students, I love to interact with the students to get them thinking.”

The Center for Undergraduate Research in Mathematics (CURM), which Dorff founded in 2007, is just one way Dorff is helping his students succeed. Based on BYU’s model of paying undergraduates to do research, CURM has grown into a $2.6 million National Science Foundation (NSF)-sponsored program. So far, Dorff and his team of co-directors have aided professors from 71 different universities to offer paid research opportunities to 226 undergraduate students, 203 of which have written joint research papers.

CURM students travel to BYU the same weekend as the Student Research Conference in March to present their findings. Of the undergraduate students that participate in the program, about 63 percent go on to graduate school as opposed to only about 18 percent of the non-CURM students at the same universities and colleges.

Dorff also began the “Careers in Math” speaker series that allows mathematics students to hear from workplace professionals, showing them the multitude of career options available to them.

Now in its sixth year, the series hosts about eight speakers each semester, including guests from Goldman Sachs, Raytheon, Google, and the Department of Homeland Security. Last year, the NSF expressed interest in funding a program to help prepare more STEM students for careers in industry, business, and government.

“We wrote a 2 million dollar grant proposal, and now it looks like they’re going to fund us. It will be like the CURM program, but it will be more related to non-academic research problems and careers,” he said. “It says a lot about the reputation we have at BYU.”

As a part of his fellowship, Dorff will receive a stipend to fund research, which he plans to use to support students in undergraduate research.

“For me, it’s all about students,” he said, “I want to use [the award] to help students.”

by Meg Monk
Teaching is an Art

Can you teach a computer how to judge art?

Dr. Dan Ventura from the Department of Computer Science, who received a Maeser Excellence in Teaching Award in August at the Annual University Conference, has done just that with his research team.

They created a computer program named DARCI that has the ability to appreciate some very basic, low-level aspects of visual art and may be able to create meaningful art in the future.

Besides working with many grad students, Dr. Ventura teaches Introduction to Computational Theory to undergraduates, who find him to be a very helpful professor despite the difficult coursework.

With so many other great teachers in this university, Dr. Ventura says he’s actually a little surprised that he, with all the other great professors here, won this award provided by the generosity of the Karl G. Maeser Scholarship Society.

Dr. Ventura expressed admiration for the professors he works with, saying any of them could have won this award.

“I’d love to sit in the classrooms of some of the other great professors in my department and learn from the way that they teach their classes,” Ventura said.

Ventura says that the students in his department make teaching easy, and he likes trying new things with them—like making a computer that can judge art.

Teaching Real Intelligence about Artificial Intelligence

Can a robot have the same type of intelligence as a human?

This is a question Dr. Tony Martinez has thought a lot about as he directs the neural network and machine-learning laboratory in the BYU PhD/MS program for the computer science department. Martinez was awarded the Alumni Professorship Award at the Annual University Conference in August.

The Alumni Professorship Award honors a faculty member for excellence in scholarship and teaching. The award comes with a three-year stipend made possible by the generosity of the BYU Alumni Association.

Martinez says that he believes there are many other candidates equally deserving of this award. Receiving it himself is inspiring for him.

“It is a real honor and makes me want to work even harder to be a benefit to BYU and our students,” Martinez said.

He has been published over 150 journal and conference papers on artificial intelligence and other machine learning and was department chair for the Department of Computer Science for 9 years.

Besides teaching a variety of computer classes for graduate and undergraduate students, he has also taught Book of Mormon and Doctrine and Covenants classes at BYU.

Whether robots will ever have souls or not may be debatable, but Dr. Martinez is definitely a man who is willing to put his heart and soul into his work in the computer science department.

by Curtis Penfold

Honored Alumni Lecture

Dr. Philip Low of Purdue University will be speaking at this year’s Honored Alumni Lecture. Low will speak on “Novel Targeted Therapeutic and Imaging Agents for Cancer and Inflammatory Diseases”

When: Thursday, October 10
11:00 a.m.
Where: 1170 Talmage Building

Upcoming Event

by Curtis Penfold
Retirees

Wayne D. Peterson, Physics
Classroom Demonstration Specialist and Physics Demonstration Area Supervisor, has retired. Wayne has enjoyed giving physics demonstrations to many groups over the years. Additionally, he developed a tagging and assignment system for distributing classroom physics equipment across campus. Wayne has been actively involved in the American Association of Physics Teachers for many years, from which he has received several awards for developing new classroom physics demonstrations. In 2007, President Cecil O. Samuelson honored Wayne with the President’s Appreciation Award at the President’s Award Banquet. In support of the Acoustics Research Group, he helped publish an article, “Song of the Singing Rod” in the Journal of the Acoustical Society of America. After retirement, Wayne looks forward to having more free time and pursuing his hobbies.

Harold Stokes, professor and former associate chair of the Department of Physics and Astronomy, has retired. During his 32 years at BYU, Harold taught a variety of courses, including many introductory physics courses. As a member of the Condensed Matter Group, he has done research that is primarily focused on computational applications of group theory to structural phase transitions in solid materials. Harold, in conjunction with Dr. Dorian M. Hatch, published a major reference work, Isotropy Subgroups of the 230 Crystallographic Space Groups, and aided in the 1993 English edition of the Russian reference book, Representations of the Crystallographic Space Groups, by O. V. Kovalev. Since 2006, he has been continuing research with Dr. Branton J. Campbell. After retirement, Harold plans to travel and serve a mission with his wife, exercise more, and spend time with his grandchildren.

Julie Boerio-Goates, professor in the Department of Chemistry and Biochemistry, has retired. Julie was the first woman tenured in the College of Mathematical and Physical Sciences and the first woman to be promoted to full professor in any of the three science colleges. “It was an honor to be part of a department that had a venerable tradition of balancing teaching, citizenship, and scholarship,” she said. Married to her colleague in the same department, Dr. Steven R. Goates, Julie said that the most important thing for women to be able to succeed in science is picking the right husband. “That’s essential,” she said. Following her retirement, she will stay busy with work for her Catholic parish as Pastoral Coordinator and may pursue an advanced degree in theology or pastoral ministry from Notre Dame.

David Embley, professor in the Department of Computer Science, has retired. David has been teaching at BYU since 1982, and has especially enjoyed the flexibility he had to make a difference in various ways. David said one of his favorite things was “seeing students ‘get it,’” and hearing that what he taught made a difference for students. He has been the department graduate and undergraduate coordinator for many years, served on the University Faculty Advisory Council for three years, and was a part of the College Rank and Status Advancement Committee. He has five patents and copyrights and has been honored with numerous awards, including the CPMS Distinguished Citizenship Award in 2012. After retirement, David will leave on a service mission where he will work with the Engineering Research Team in the Church’s Family History Department.

College Grants

Chemistry & Biochemistry
Jaron Hansen & Randy Shirts
Sponsor: NSF
Title: The Role of Radical Water Complexes in the Atmosphere

Computer Science
Jay McCarthy
Sponsor: NSF
Title: EAGER: A Measure Theory Semantics of Probability Theory

Physics & Astronomy
Kent Gee & Tracianne Neilsen
Sponsor: BRR&C (Air Force)
Title: Acoustic Field and Source Measurement Support for the Joint Strike Fighter Program

Eric Hirschmann & David Neilsen
Sponsor: NSF
Title: Collaborative Research: Loud, Bright, and Hot Binary Mergers

David Embley, professor in the Department of Computer Science, has retired. David has been teaching at BYU since 1982, and has especially enjoyed the flexibility he had to make a difference in various ways. David said one of his favorite things was “seeing students ‘get it,’” and hearing that what he taught made a difference for students. He has been the department graduate and undergraduate coordinator for many years, served on the University Faculty Advisory Council for three years, and was a part of the College Rank and Status Advancement Committee. He has five patents and copyrights and has been honored with numerous awards, including the CPMS Distinguished Citizenship Award in 2012. After retirement, David will leave on a service mission where he will work with the Engineering Research Team in the Church’s Family History Department.
Chemistry & Biochemistry


Computer Science


Physics & Astronomy


Statistics

