

# Newsletter

College of Physical and Mathematical Sciences

September 2007



## In this issue:

Computer Science Alumni Recruiting Event 1

Chemistry Welcomes New Faculty 2

Dr. Goodrich receives REU extension 2

Math Welcomes News Faculty 3

Computer Science Visiting Scholars 3

Chemistry Magic Shows 4

Dr. H. Dennis Tolley Receives Special Award 4

College Publications 5

## Computer Science Alumni Recruiting Event

The BYU Computer Science Department took part in a new recruiting program at Microsoft. Reacting to the growing demand for computer programmers and software engineers, Microsoft is introducing a program to cull new employees from universities' alumni networks. Recognizing the high quality of BYU Computer Science graduates, and having had great success recruiting at BYU in the past, Microsoft launched its pilot alumni recruiting event at BYU on Friday, September 7, in the beautiful Gordon B. Hinckley Alumni Center.

Invitations were sent out to BYU Computer Science alumni living on the Wasatch Front and garnered a huge response. Nearly 200 alumni RSVP'd to attend with a guest. In fact, the large number of attendees meant that the guests spilled out of the Alumni Center's Great Hall and onto the patio and beautiful gardens west of the building. Those sitting outside enjoyed the breathtaking views of the setting sun as they looked out west over Provo.

Those who attended were treated to tours of the recently constructed building and enjoyed a three-course meal. The music of BYU jazz-vocalist Hayley Singley provided a lovely backdrop to the evening.

Following the meal, BYU Computer Science Alum and Senior Microsoft Researcher, Dr. Stephen Richardson, spoke to the crowd. He related his professional journey, which began when he was a BYU undergraduate and came full-circle at Microsoft, where he has been able to turn the research interests he developed at BYU into products available to the general public. Dr. Richardson demoed one such product, Windows Live Translator (<http://translator.live.com/>), at the event. Translator, which automatically translates Internet pages into dozens of languages, was released to the public on the evening of Thursday, September 6, less than 24 hours before Dr. Richardson presented it to an admiring crowd at the BYU event. It is a result of the research in natural language processing that Dr. Richardson started at BYU in the 80s as an undergraduate. Translator is being announced to the world at a conference in Oslo, Norway, this week. Dr. Richardson also demoed Microsoft Surface (<http://www.microsoft.com/surface/>) and gave the crowd a preview of Microsoft Photosynth (<http://labs.live.com/photosynth/>), a brand-new technology that allows users to turn their digital photo collections into a 3D rendering of that space. Following Dr. Richardson's presentation, prize drawings were held for a \$500 ski resort gift certificate and an Xbox 360.

Brent Hall, the College's liaison with LDS Foundations and one of the organizers of the event, remarked, "The Microsoft dinner was a great time for our alumni to meet and network. It was a pleasure to be in the new Hinckley Building." He also passed on the Microsoft recruiters' praise of BYU Computer Science students, saying, "[Microsoft] spoke in glowing terms about the quality of person and the academic preparedness that comes with a BYU graduate."



Indeed, BYU is in the top tier of universities with Microsoft recruits, ranking fourth among universities in terms of the number of graduates working for Microsoft. Current and future BYU Computer Science students are being benefited by the department's association with Microsoft. In 2006, BYU alumni working at Microsoft sponsored a mentorship for BYU computer science students in conjunction with Microsoft's annual giving campaign. Part of their donations enabled four undergraduate students to conduct significant research under the direction of a faculty mentor during the Winter 2007 semester. The remaining portion of the donations went towards the creation of an endowed fund, which will support student mentorships in computer science for generations to come.



**Important Dates & Events in the College**

**Chemistry Magic Shows**

**Oct. 22, 6:00 p.m., room WIII BNSN**

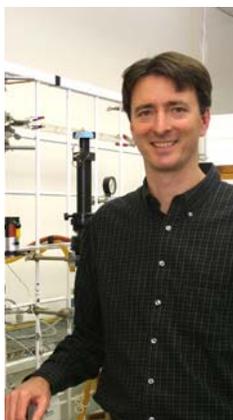
**Oct. 23, 7:00 p.m., room WIII BNSN**

**Oct. 24, 7:00 p.m., room WIII BNSN**

**Oct. 25, 7:00 p.m., room WIII BNSN**

**Oct. 26, 7:00 p.m., room WIII BNSN**

**Department of Chemistry & Biochemistry Welcomes New Faculty**



Dr. Richard Watt is a bio-inorganic chemist who studies metallo-proteins and metallo-enzymes. The laboratory goals are to define medicinal and material science applications for these metal-containing proteins.

Richard joined the department this summer after spending six years at the University of New Mexico. Richard's wife Camille is a homemaker who received a B.S. degree from Utah State in English. She enjoys balancing his life by educating him with English literature and other great literary works. They have three daughters, Hilary (14), Jocelyn (12), and Whitney (3).



Dr. Young Wan Ham is a new addition to organic chemistry faculty, joining from Molecular Therapeutics, a biotech company in Ann Arbor, MI. He came to

the U.S. for graduate study in 1996 from South Korea and received his Ph.D. from Purdue. He is also interested in developing polymeric nanoparticles for targeted delivery of small molecule drugs as well as macromolecules like DNA or RNA. Dr. Ham enjoys hiking, camping, skiing, and occasional golfing. With his wife Soo Kyung, he has three children: Jun Hyung (12), Ryan (10), and Rachel (7).

**Dr. Goodrich receives REU extension**

Dr. Mike Goodrich's Human Centered Machine Intelligence Laboratory received an REU extension to our NSF grant. The grant will be used to get BYU and UVSC students working together to support UAV-enabled Wilderness Search and Rescue. The grant is a \$12,000 extension.



James Patterson joined the Department of Chemistry and Biochemistry on August 1<sup>st</sup> as an assistant professor.

James is a physical chemist who studies chemical processes at interfaces on a femtosecond time scale. He earned B.S. and M.S. degrees at BYU, then went on for Ph.D. work at the University of Illinois. He received post-doctoral training at the Institute for Shock Physics at Washington State University. James' wife Emily is also a graduate of our department with both B.S. and M.S. degrees. James and Emily and their four children have settled in Orem.



Jeffrey Mace-done joined the Department of Chemistry and Biochemistry this fall as an assistant teaching professor.

Jeff received his B.S. and Ph.D degrees from BYU, and he completed post-doctoral training under the direction of Paul Farnsworth. Jeff held a temporary faculty appointment in our department during the first half of 2007. Jeff is married to Randalynn and they have three children.

## Math Department Welcomes New Faculty



Jessica Purcell is an assistant professor coming to the BYU Mathematics Department from a post-doc at the University of Texas at Austin. She received her bachelor's degree in mathematics from the University of Utah in 1998, her master's degree from the University of Michigan in 1999, and her Ph.D. from Stanford University in 2004. Her dissertation, supervised by Steven Kerckhoff, was titled, "Cusp shapes of hyperbolic link complements and Dehn filling." Dr. Purcell's research interests include three-dimensional manifolds, hyperbolic geometry, and knot theory. She will be on leave at Oxford University from September 2007 to 2008.

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Todd Fisher is an assistant professor coming to the BYU Mathematics Department from a post-doc at the University of Maryland. He received his bachelor's degree in mathematics from BYU (minor in physics) in 1998, his master's degree

from BYU in 1999, and his Ph.D. from Northwestern University in 2004. His advisor was Amie Wilkinson and the title of his dissertation was "On the Structure of Hyperbolic Sets." Dr. Fisher's research interests include hyperbolic dynamical systems, symbolic dynamics, and topological dynamics.

## Computer Science Visiting Scholars

The Computer Science Department has been privileged to welcome three talented visiting scholars into the department within the last year.



Xin Li arrived on January 23 from the University of Science and Technology in China, where he is a doctoral candidate. He has always had a deep interest in

computers and decided to pursue a degree in this field upon entering college. He is working on his combined masters and doctoral degrees and conducting research in the area of computer-aided geometric design and computer graphics. Xin's advisor at USTC, Falai Chen, was once a resident scholar at BYU. Dr. Chen was contacted last year by Dr. Thomas Sederberg, who was looking for an exceptional student to sponsor as a visiting researcher, and nominated Xin for the position. Xin will complete his tenure at BYU in January 2008, at which time he will return to China to defend his doctoral dissertation. Xin is looking forward to the future after graduation. Although he is not sure what the future will hold, he would consider returning to America, as he says he has enjoyed his time here and has learned a lot working with Dr. Sederberg.



Hongwei Lin is another scholar working with Dr. Sederberg. Hongwei received his PhD from Zhejiang University in China in 2004.

Since that time, he has been a professor at another educational institution in China, the State Key Laboratories of Computer Aided Design and Computer Graphics. There, he researches and teaches courses in computer graphics and reverse engineering. Hongwei was familiar with Dr. Sederberg's work from SIGGRAPH conventions and from other publications and conferences. Therefore, when Guojin Wang, Hongwei's supervisor, contacted him about the opportunity to research at BYU with Dr. Sederberg, Hongwei was excited about the opportunity. Hongwei will remain at BYU until February 2008, when he will return to his teaching and research position in China.



In August, Xingfu Wang began a one year stay as a visiting research on a fellowship from the Chinese Government. Xingfu is an associate professor in English Education at Chongqing University. In 2004, he began

work on his doctorate degree to combine linguistic knowledge, natural language processing, and corpus linguistics in the College of Computer Science at Chongqing University. This is a trial project between the Colleges of Foreign Languages and Computer Science. He is also the secretary of the Research Academy for Linguistics, Cognition & Application, where he manages the daily work and administration of research projects, among other responsibilities. He has published more than ten papers both independently and with others and has co-edited three textbooks for college students. He will be working with Dr. Eric Ringer in the Natural Language Processing Lab.

# Chemistry Magic Shows

The Department of Chemistry and Biochemistry and the Central Utah Section of the American Chemical Society would like to announce the following activities in celebration of National Chemistry Week during the week of October 21-27, 2007. National Chemistry Week is an outreach program sponsored by the ACS. It is designed to enhance the public's awareness of the contributions that chemistry makes to society and to our everyday lives. National Chemistry Week is celebrated yearly during the third full week of October (Sunday through Saturday) by ACS local sections. The theme this year is, "The Many Faces of Chemistry."

## ACTIVITIES

(1) Chemical Magic shows will be held the following dates and times:

**October 22, 6:00 p.m., room W111 BNSN**

**October 23, 7:00 p.m., room W111 BNSN**

**October 24, 7:00 p.m., room W111 BNSN**

**October 25, 7:00 p.m., room W111 BNSN**

**October 26, 7:00 p.m., room W111 BNSN**



Each show will last about one hour. The demonstrations are proven crowd-pleasers illustrating important principles of chemistry. Since seating is limited, tickets will be required. Call 422-3667 to reserve your tickets.

Tickets are free, and we invite all teachers, students, parents, scout troops, and members of the general public to attend.

(2) Research Poster Session. The posters will be on display in the Benson Building lobby October 25-26 describing current research in the BYU Department of Chemistry and Biochemistry and in local companies. A reception will be held on Friday, October 26 from 4:00 - 6:00 p.m.

## Dr. H. Dennis Tolley Receives Special Award



Dr. H. Dennis Tolley was chosen as the 2007 recipient of the Melvin W. Carter Professorship. Dr. Tolley is an ideal scientist, researcher, teacher, and collaborator. He is committed to scientific honesty and he is enthusiastic about communicating statistical principles to others. He stimulates students to perform their best and he is an active mentor to faculty and students.

Dr. Tolley is a very active researcher in areas of importance to society. His circle of collaborators extends internationally and he has gained recognition and influence in his discipline reaching well beyond local and regional boundaries. His work has been recognized with awards from the students of BYU, the College of Physical and Mathematical Sciences, and the University as well as international peers, the Society of Actuaries, and the American Statistical Association.

In 1999 Dr. Tolley was awarded the honorary rank of Fellow by the American Statistical Association. As stated by the ASA, he received this award "For unbounded enthusiasm in communicating statistical principles to diverse audiences at all levels; for contributions to modeling of social, economic, and environmental issues on a world-wide scale; for diversity of interest and contributions in many areas of science; and for excellence in research and consulting."

Dr. Tolley has brought and continues to bring recognition to the department, college, and university. He sets a high standard as the first recipient of the Melvin W. Carter Professorship.

## **Chemistry and Biochemistry**

Lu, X. , D. Li, N.K. Dalley, S.G. Wood, and N.L. Owen, "Structure Elucidation of Compounds Extracted from the Chinese Medicinal Plant *Patrinia heterophylla*," *Natural Product Research*, **21**(8), 677-685 (2007).

Bartsch, R.A. , N.K. Dalley, J.F. Cannon and U. Olsher, "Solid-state Structures for 2-Methoxy-1,3-xylyl-18-crown-5 and 2-Methoxy-1,3-xylyl-21-crown-6: A Search for C—H...O Interactions," *J. Inc l. Phenom. Macrocy. Chem.*, **58**, 237-240 (2007).

Boda,, D. W. Nonner, M. Valisko, D. Henderson, B. Eisenberg, and D. Gillespie, "Steric Selectivity in Na Channels Arising from Protein Permeation and Mobile Side Chains," *Biophysics J.*, **93**, 1960-1980 (2007).

Alawneh, M. and D. Henderson, "Monte Carlo Simulation of the Double Layer at an Electrode Including the Effect of a Dielectric Boundary," *Molec. Simulation*, **33**, 541-547 (2007).

Bhuiyan, L.B. , C.W. Outhwaite, D. Henderson and M. Alawneh, "A Modified Poisson-Boltzmann Theory and Monte Carlo Simulation Study of Surface Polarization Effects in the Planar Diffuse Double Layer," *Molec. Physics*, **105**, 1395-1402 (2007).

Bhuiyan, B. , C.W. Outhwaite and D. Henderson, "Some Simulation and Modified Poisson-Boltzmann Theory Results for the Contact Values of an Electrolyte Near a Charged Electrode," *J. Electroanalytical Chem.*, **607**, 54-60 (2007).

Liu, R. , S.R. Herron, S.A. Fleming, "Copper-catalyzed Tethered Aziridination of Unsaturated N-tosyloxy Carbamates," *J Org. Chem.*, **72**(15), 5587-91 (2007).

## **Computer Science**

Henderson, E. K., and Martinez, T. R. , Constructing Low-Order Discriminant Neural Networks Using Statistical Feature Selection, */Journal of Intelligent Systems/*, vol. \*16\*, no. 1, pp. 27-56, 2007.

Menke, J. and Martinez, T. R. , A Bradley-Terry Artificial Neural Network Model for Individual Ratings in Group Competitions, to appear in the */Journal of Neural Computing and Applications/*, 2007.

Peterson, A. and Martinez, T. R. , Finding the Real Difference Between Learning Algorithms, to appear in the */Journal of Theoretical and Experimental Artificial Intelligence/*, 2007.

Zeng, X. and Martinez, T. R. , Using Decision Trees and Soft Labeling to Filter Mislabeled Data, to appear in the */Journal of Intelligent Systems/*, 2007.

Gashler, M., Ventura, D. , and Martinez, T. R. , Dimensionality Reduction by Manifold Sculpting, to appear in */Proceedings of NIPS' 07 (Neural Information Processing)/*, 2007.

Giraud-Carrier, C. and Martinez, T. R. , Learning by Discrimination: A Constructive Incremental Approach, to appear in the */Journal of Computing (JCP)/*, vol. \*2\*, no. 5, 2007.

Lee, J. and Giraud-Carrier, C. (2007). Transfer Learning in Decision Trees. In */Proceedings of the International Joint Conference on Neural Networks/*, #1208.

Ivie, S., Pixton, B. and Giraud-Carrier, C. (2007). Metric-Based Data Mining Model for Genealogical Record Linkage. In */Proceedings of the IEEE International Conference on Information Reuse and Integration/*, 538-543.