Newsletter

College of Physical and Mathematical Sciences

January 2007

ANNUAL COLLEGE DINNER

Friday, January 19th, the College of Physical and Mathematical Sciences held their Annual College Dinner. Beginning at 6:30 pm, dinner was catered by A Vikings' Feast Catering. After the amazing meal and amidst various jokes from Dean Woolley, the following recipients received awards from the college:

Scott Ritter (Geology)	Excellence in Teaching 10+ years
Steve Woods (Chemistry)	Excellence in Teaching 3-10 years
Jeannette Lawler (Physics)	Exemplary Service Admin/Staff
Freeman Anderson (Physics)	25 years of Service
James Logan Jr (Math)	25 years of Service
Dorothy Siebert (Chemistry)	20 years of Service
Diann Sorensen (Physics)	20 years of Service
Melanie Burton (Advisement)	10 years of Service
Klark Walker (CS)	10 years of Service
Kathi Carter (Stats)	5 years of Service
Lynn Patten (Deans)	5 years of Service
Robert Paxman (Chemistry)	5 years of Service

A delightful evening was shared with the faculty, staff, and retirees that contribute so much to the success of the College of Physical and Mathematical Sciences.

Thank you to those who came early to help set-up and those who stayed to late to help take-down. Your help was greatly appreciated!

In this issue:

Important Dates & Events in the College

February 2007

Thursday, February 1

CS Colloquium, David Nister, 11 AM 1170 TMCB

Friday, February 2

Chemistry Biochemistry Seminar, Rachel Green, 4 PM W140 BNSN

Monday, February 5

Chemistry ACS Tour Speakers, Mickey Sarquis & Lynn Hogue, 4 PM W140 BNSN

Thursday, February 8

Chemistry Inorganic Chemistry Seminar, "Health Care Applications of Data Mining ", Seth Cohen, 4 PM W140 BNSN

CS Colloquium, Mollie Poynton, 11 AM 1170 TMCB

Geology Lecture Series, Marc T. Eckels, "Seismic Exploration and Gas Production in the Uinta Basin", 11 AM

Wednesday, February 14

Technical Career Fair, 9 AM-3 PM WSC Ballroom

Thursday, February 15

Chemistry Biochemistry Seminar, Norbert Polacek, 4 PM, W140 BNSN

CS Colloquium, Katherine St. John, 11 AM 1170 TMCB

Geology Lecture Series, Isabel Muller, "Using Vitrification to Protect the Columbia River at Hanford: the Department of Energy's Largest and Most Complex Environmental Cleanup Project", 11 AM C295 ESC

Geology Lecture Series, Marian Warner, "An Exploration Case History: How We Made a High-Impact Gas Discovery in a Maturing Basin (Western Canada)", 11 AM

Math Colloquium, John Milnor, 4 PM 3714 HBLL

Wednesday, February 21

Chemistry Frontiers in Chemistry Lecture, John Wolfe, 4 PM W140 BNSN

Math Seminar, Jasbir Chahal, 4 PM 133 TMCB

Thursday, February 22

Chemistry Biochemistry Seminar, Rafael Casellas, 4 PM W140 BNSN

Geology Lecture Series, R. William Keach, II, "3D Seismic Exploration", 11 AM TBA

Monday, February 26

Chemistry Teaching Seminar, Jan Hayes, 4 PM W140 BNSN

Tuesday, February 27

Chemistry Physical Chemistry Seminar, Anne Chaka, 4 PM W140 BNSN

Spring Research Conference 2007

The Spring Research Conference will be held this year on Saturday, March 17 beginning at 8 AM in the Martin Building. Please visit the College web site at **cpms.byu.edu** and follow the **2007 Spring Research** link for further information.

The abstract submittal deadline is **midnight, March 1, 2007**.

All CPMS students, including graduate students, are encouraged to participate in this conference.

Do you remember when…

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Liquid-filled lakes found on Saturn's moon Titan

Rosalie Westenskow
Deseret Morning News
Saturday, January 6, 2007

Saturn's mysterious moon Titan has numerous liquid-filled lakes on its surface, according to one Brigham Young University professor, but tourists wouldn't want to take a dip in these pools.

"We think these (lakes) are filled up with methane," said Jani Radebaugh, co-author of an article about the lakes, which appeared in this week's edition of Nature magazine.

The colorless, odorless gas methane, a component of natural gas, is abundant in the moon's atmosphere.

"That's why it (Titan) looks like kind of a big, smoggy, orange ball," said Radebaugh, a professor with BYU's Department of Geological Sciences.

Scientists discovered more than 75 lakes, which lie at the north pole of the moon, after viewing radar images of Titan's surface taken by the NASA spacecraft Cassini in July.

The lakes range in size from approximately one to 60 miles wide and some share uncanny characteristics with popular lakes on Earth.

"One really stood out to us and looked like Lake Powell," Radebaugh said.

The discovery confirms a long-held belief among scientists that lakes exist on Titan, which is larger than Mercury and one of Saturn's 34 moons. It also reveals a cycle of liquid on the planet that is similar to Earth's hydrological cycle, Radebaugh said, the difference being that the liquid on Titan is methane, not water.

An active liquid cycle, in which liquid moves from the atmosphere to the surface and back again, is a rare find.

"There's no other body in the Solar System like this besides Earth," Radebaugh said.

The discovery may allow scientists to probe the origins of life on Earth because it confirms a similarity between the two planetary bodies. Titan has many of the chemical building blocks of life — nitrogen, carbon, hydrogen and oxygen — and scientists conjecture its atmosphere resembles Earth's billions of years ago, according to NASA's Web site.

"If we look at places that have those chemicals and look at how the processes work, then we might get a little bit closer to understanding how life began (on Earth)," Radebaugh said.

Mars also has evidence of a liquid cycle, but it may be more useful as a projection of Earth's future than its past.

"It looks like something like this has happened in the past (on Mars), but the very distant past," Radebaugh said.

One of about 30 of the article's authors, Radebaugh has also studied radar images of dunes and mountains on the surface of Titan.

The moon's dunes, which appear to number near 10,000, span larger areas than those on Earth and have a much more dangerous composition.

"On Titan, we actually think they (the dunes) are made up of solid particles of gasoline," Radebaugh said.

The spacecraft Cassini is slated for at least another year in Saturn's orbit with a monthly pass by Titan.

College Publications

Chemistry and Biochemistry

J.M. Edwards IV, M.N. Hamblin, H.V. Fuentes, B.A. Penni, M.L. Lee, A.T. Woolley and A.R. Hawkins "Thin Film Electroosmotic Pumps for Biomicro-fluidic Applications," Amer. Inst. Physics,

R.M. Izatt, "Charles J. Pedersen: Innovator in Macrocyclic Chemistry and Co-recipient of the 1987 Nobel Prize in Chemistry," *Chem. Soc. Reviews*, **35**, 1-6 (2006).

D.J. Henderson, "The Adsorption of Fluids", in *Encyclopedia of Surface and Colloid Science*, 2nd Ed., Taylor & Francis, New York, 2006, pp. 435-443.

D.T. Wasan, A.D Nikolov, A. Trokhymchuk and D. Henderson, "Confinement Induced Structural Forces in Colloidal Systems," in *Encyclopedia of Surface and Colloid Science*, 2nd Ed., Taylor & Francis, New York, 2006, pp. 1485-1494.

B. Bhuiyam, C.W. Outhwaite and D.J. Henderson, "The Planar Electric Double Layer for a Restricted Primitive Model Electrolyte at Low Temperature," *Langmuir*, **22**, 10639-10634 (2006).

Computer Science

D. Jensen and C. Giraud-Carrier, "A Topological Embedding of the Lexicon for Effective Semantic Distance Computation," *Proceedings of the Seventh International Workshop on Computational Semantics*, 259-270 (2007).

K. Daniels and C. Giraud-Carrier, "Learning the Threshold in Hierarchical Agglomerative Clustering", *Proceedings of the Fifth International Conference on Machine Learning Applications*, 270-275 (2006).

B. Wenerstrom and C. Giraud-Carrier, "Temporal Data Mining in Dynamic Feature Spaces", *Proceedings of the Sixth International Conference on Data Mining*, 1141-1145 (2006).

A.J. Lee, K. E. Seamons, M. Winslett and T. Yu, "Automated Trust Negotiation in Open Systems", *Secure Data Management in Decentralized Systems*, (2006).

R. C. Jammalamadaka, T. W. van der Horst, S. Mehrotra, K. E. Seamons, and N. Venkasubramanian, "Delegate: A Proxy Based Architecture for Secure Website Access from an Untrusted Machine", *22nd Annual Computer Security Applications Conference (ACSAC), Miami, FL*, (2006).

Manoj Pandey, Roger Pack, Lei Wang, Qiuyi Duan and Daniel Zappala, "To Repair or Not to Repair: Helping Routing Protocols to Distinguish Mobility From Congestion", *IEEE Infocom MiniSymposia*, (2007).

Manoj Pandey, Daniel Delorey, Qiuyi Duan, Lei Wang, Charles Knutson, Daniel Zappala, and Ryan Woodings, "RIA: An RF Interference Avoidance Algorithm for Heterogeneous Wireless Networks", *IEEE WCNC*, Hong Kong, (March 2007).

Douglas J. Kennard and W. Barrett, "Interactive Training for Handwriting Recognition in Historical Document Collections," *Document Recognition and Retrieval XIV*, (2007).

L. Xu and D.W. Embley, "A composite approach to automating direct and indirect schema mappings", *Information Systems*, Vol. 31, Nr. 8, 697-732 (2006).

W.Y. Mok and D.W. Embley, "Generating compact redundancy-free XML documents from conceptual-model hypergraphs", *IEEE Transactions on Knowledge and Data Engineering*, Vol. 18, Nr. 8, 1082-1096 (2006).

Geological Sciences

B.B. Britt, R.D. Scheetz, D.B. Brinkman, and D.A. Eberth, 2006. A Barremian Neochoristodere from the Cedar Mountain Formation, Utah, U.S.A. *Journal of Vertebrate Paleontology*, 26(4):1005-1008.

W.D. Tidwell, M. Connely, B.B. Britt, 2006. A flora from the base of the Upper Jurassic Morrison Formation near Como Bluff, Wyoming, USA. In, Foster, J.R., and Lucas, S.G., eds., Paleontology and Geology of the Upper Jurassic Morrison Formation. *New Mexico Museum of Natural History and Science Bulletin* 36: 171-181.

D.A. Eberth, B.B. Britt, R.D. Scheetz, K.L. Stadtman, and D.B. Brinkman, 2006. Dalton Wells: Geology and significance of debris-flow-hosted dinosaur bonebeds (Cedar Mountain Formation, eastern Utah, USA). *Palaeoclimatology, Palaeoecology, Palaeoclimatology*, 236:217-245.

Mathematics

S. Glasgow, M. Meilstrup (then a ugrad), J. Peatross, M. Ware, "Real-time recoverable and irrecoverable energy indispersive-dissipative dielectrics," *Physical Review E*, (2006).

D. Doud and B. Hansen, "Explicit Frobenius calculations supporting a generalization of a conjecture of Serre," *JP Journal of Algebra, Number Theory and Applications*, Vol. 6 #2 381-398 (2006).

Physics and Astronomy

B. J. Taylor and M. D. Joner, "Deriving Color-Color Transformations for VRI Photometry," *Publications of the Astronomical Society of the Pacific*, 118: pp. 1716-1738, 2006 December.

Matthew Anderson, Eric W Hirschmann, Steven L Liebling and David Neilsen, "Relativistic MHD with adaptive mesh refinement Class", *Quantum Grav*, 23 No 22 6503-6524 (2006).