CHEMICAL BONDS
THE UNIVERSITY OF TENNESSEE, KNOXVILLE • DEPARTMENT OF CHEMISTRY

Winter 2014

Professor Musfeldt Chaired
Gordon Research Conference

Multiferroic & Magnetolectric Materials
Gordon Research Conference
University of New England, Biddeford, Maine
August 10 – 15, 2014
Chair Janice L. Musfeldt
Vice Chair Bernd Lorenz

WHERE BONDS ARE MADE
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Dear Chemistry Community:

On October 21, 2014, University of Tennessee Knoxville Distinguished Scientist Georges Andre Guiochon passed away in the arms of his wife with his daughters holding his hands. After a successful bout against pneumonia, Professor Guiochon succumbed to neuromuscular failure due to Post-Polio Syndrome. His work as Professor in the Department of Chemistry since 1987 focused on the theory of non-linear chromatography and its applications in gas, liquid and supercritical fluid separation science. His UT efforts garnered awards too numerous to list but included 2 from ACS and the LCGC Lifetime Achievement Award, while he received honorary PhD degrees from the Universities of Pardubice, 1999; Ramon Llull, Barcelona 2002; Ferrara 2003; and Science and Technology, Liaoning 2010, and was inducted into the Spanish Academy of Science in 2011. He published 5 books and about 1100 peer-reviewed papers while performing research with over a hundred graduate students and post-docs.

written by Dr. Lois Beaver, wife of Georges

Events Planned to celebrate the life of Georges Guiochon

1. Lois’ family—funeral mass and lunch in Buffalo, NY Friday, Nov. 28.
2. Private interment in France at the Guiochon Family Crypt

Gathering in honor of Georges Guiochon
2:30 pm, Saturday, December 6, 2014
La Maison des Polytechniciens
12, rue de Poitiers
75007 PARIS, FRANCE
If you wish to participate, please respond by November 30 to:
souvenirgeorgesguiochon@gmail.com

Celebration of a Scientist

Saturday, March 14, 2015
University of TN, Knoxville

If you wish to participate, please respond to jrui@utk.edu to reach Rachel Rui, PhD, who will provide more information when it is available.
Professor Emeritus Lee Magid Became NSSA Fellow

Lee Magid, Professor Emeritus of Chemistry at the University of Tennessee, Knoxville, was selected as one of 2014 Neutron Scattering Society of America Fellows, for her “outstanding leadership in cold neutron research on complex fluids and critical service to the neutron field.”

Magid received her PhD degree in chemistry from the University of Tennessee, Knoxville in 1973, and joined the faculty that same year. She retired in 2006.

In her research she studied the structure and dynamics of organized assemblies such as micelles and polyelectrolytes via (among other techniques) small-angle neutron scattering, neutron spin-echo spectroscopy and neutron reflectivity. She served as Associate Dean for Research in the College of Arts and Sciences from 1987 to 1990, and as Executive Assistant to the Chancellor, 1990-91; she was Vice-President for Research and Graduate Studies at the University of Kentucky from 1991 to 1994. She also served as Executive Officer and Science Advisor in the National Science Foundation’s Chemistry Division from 2004 to 2006.

Magid has held several short-term research appointments at Oak Ridge National Laboratory, the Swiss Federal Institute of Technology in Zuerich, and the Max Planck Institute in Goettingen, Germany. She is a Fellow of the American Association for the Advancement of Science and chaired the Solid State Sciences Committee of the National Academies/National Research Council. She also led or participated in numerous studies and planning activities for the Spallation Neutron Source and for a planned European spallation source.

Professor Williams Retired After 53 Years of Service

The Chemistry Department held a party for Professor Williams on May 17, 2014 at the University Visitors Center to celebrate his retirement after 53 years of services to the University.

Williams joined the Department in 1961 as an Assistant Professor. His tenure at the University and continuous funding from the Department of Energy for almost 40 years have allowed Williams the chance to do what he loves most - research. He has also been active in teaching, however, and was the recipient of the Student Associates of the American Chemical Society (SAACS) Outstanding Chemistry Professor Award in both 2009 and 2010.

Williams has been engaged in research on various aspects of radiation chemistry and intermediate species in chemical reactions for over 60 years. One of his most-pround-of research projects was conducted in the 1970s. He was the first one to demonstrate quantum-mechanical tunneling and “all-or-nothing” deuterium isotope effects in hydrogen-transfer reactions at low temperatures. Williams has generated more than 200 journal articles, among which many are cited for more than 100 times.

During his years at UT, Williams has directed 18 Ph.D. dissertations and 7 M.S. theses. He has received numerous awards and honors, including being a National Science Foundation Visiting Scientist, which allowed him to conduct research in Kyoto University, Japan; and a John Simon Guggenheim Memorial Foundation Fellow, a fellowship that nowadays seems “almost impossible to get” with 4,000 applications each year for some 200 awards. He has also chaired the Gordon Research Conferences on Radiation Chemistry (1971) and Radical Ions (1984).
Researchers interested in systems biology now have a new resource on campus that provides novel bioanalyses. The Biological Mass Spectrometry Center provides state-of-the-art capabilities in metabolomics and lipidomics, which allow simultaneous detection of thousands of metabolites and lipids. This facility engages a number of faculty from the colleges of Arts and Sciences; Engineering; Education, Health, and Human Sciences; and Veterinary Medicine at UT, as well as the UT Institute of Agriculture and the UT Medical Center. Although the center is only a few years old, data generated from this effort has already been incorporated into several successful proposals to the National Science Foundation and has led to joint publications with faculty from the departments of Microbiology; Biochemistry and Cellular and Molecular Biology; Chemistry; Nutrition; Animal Science; and Food Science, as well as the College of Veterinary Medicine.

Shawn Campagna (right), associate professor of chemistry, directs the program with the assistance of an eight-member advisory council of faculty representatives from the participating units. The center also engages undergraduate junior and senior chemistry majors through mentored research. Currently, the facility employs and provides tuition waivers for two graduate students who help maintain the instrumentation and execute experiments. The center also acts as a managed user facility that provides training on the use of and access to state-of-the-art instrumentation for graduate students from a number of departments.

Article from Higher Ground 2013 Annual Report.
Picture by Jeremy Hughes.

Professor Jenkins Spoke at Pregame Showcase

Football fans and the public were invited to attend the College of Arts and Sciences’ 25th annual Pregame Showcase lecture series, held two hours before all home game kickoffs in the Carolyn P. Brown Memorial University Center, Room 213. Featuring award-winning teachers of the College of Arts and Sciences, the Pregame Showcase offers fans the unique experience to learn from some of UT’s most exceptional faculty members through timely and informative lectures guaranteed to stretch the mind.

This year chemistry professor David Jenkins, recent NSF CAREER award winner, was featured at the November 15 pregame showcase before UT’s game with Kentucky (Kickoff Time: 4:00pm). Jenkins talked about “Expanding the Synthetic Toolbox for Pharmaceuticals”.

Article from Higher Ground 2013 Annual Report.
Picture by Jeremy Hughes.
Janice Musfeldt, professor of chemistry, chaired the first Gordon Research Conference in multiferroics and magnetoelectrics held from August 10th to 15th in University of New England in Biddeford, Maine.

The conference featured a wide range of scientifically and technologically important topics such as the origins of various microscopic coupling mechanisms, the behavior of domain structures, the role of spin-orbit coupling, and the consequences of nanoscale confinement. Due to the highly interdisciplinary nature of the conference, invited speakers represented various scientific disciplines including chemistry, physics, materials science, and engineering. One of the attendees commented that this conference was simply “top end.”

“The scientific level and the open nature of the exchange at the talks and beyond was remarkable,” Dr. Ashot Melikyan, an editor of Physical Review B, commented. “I will certainly be applying to 2016 Gordon Conference on multiferroics. The editors of APS usually attend 2 - 4 conferences every year, and this one was one of the most informative and useful conferences I attended.”

Ken O’Neal and Michael Yokosuk, graduate students in the Musfeldt’s group attended the conference. O’Neal presented a poster titled “Size- and Shape-Dependent Magnetoelectric Coupling in alpha-Fe2O3 Nanoparticles.” Yokosuk’s poster talk was on magnetoelectric properties of a material Ni3TeO6 titled “Magnetoelectric Coupling in Ni3TeO6.” They both enjoyed presentations from “leading scientists in the field”, and described their experiences as “awesome.”

“I love bringing people together to discuss new science,” Musfeldt said. “In fact, I am already at work on the 2015 Telluride workshop on spin-orbit coupling in 4- and 5d-containing materials!”

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Professor Sepaniak’s Research Highlighted by NSF

Professor Sepaniak’s research entitled “Pillar arrays assist with lab-on-a-chip chemistry” has been published as one of NSF highlights on NSF’s SEE Innovation website. Highlights describe outcomes of NSF-funded research. They are archival in nature and cover research results and impacts of both expired and active grants.
Chemistry Professors Participated in eVOL10 Program

Chemistry Professors Michael Best and Brian Long participated in a high school outreach program eVOL10. They mentored students to design, build and test vehicles that were propelled through the combination of sodium bicarbonate and acetic acid. The final runs of the cars were held on Thursday, June 12 at the Buehler Hall loading dock at 8:30 am. A total of 32 students participated in this year’s eVOL10 program. Evolved from a previous program: Introduction of Sophomores To Engineering Principles (INSTEP), eVOL10 is a one-week summer program started in 2013. It introduces participants to applied sciences and ACT math preparation, and provides opportunities for them to compete in challenges involving the interplay between chemistry and engineering, and tour an engineering industrial plant. The program was provided to students at no major cost and is projected to continue in future years. This is the second year that Best and Long participated. They both received eVOL10 Service Awards after last year’s program.

Larese Organizes Neutron Molecular Spectroscopy Symposium

John Larese, professor of chemistry, has organized a symposium “Neutron Spectroscopy And Scattering At The Spallation Neutron Source: Opportunities For Chemists In The Southeast And Beyond” for 2014 Southeast Regional Meeting of American Chemical Society (SERMACS) that will be held from October 16 to 19 in Nashville, Tennessee.

This symposium will bring together identified experts in the field of neutron molecular spectroscopy, including Larese who spearheaded the effort to bring such spectroscopy to the Spallation Neutron Source (SNS).

“It will not only increase the University’s visibility as a leader in performing cutting edge science with neutrons but also extends our professional relationships beyond the borders of Tennessee.” Larese said. “Furthermore, it allows us to introduce the Universities intellectual and professional expertise to a diverse group of students, faculty and scientific professionals not typically assembled in a concentrated forum within the Tennessee borders.”

The SNS is located on Chestnut Ridge within the Oak Ridge National Laboratory (ORNL) complex, about 30-minutes drive from the University of Tennessee Knoxville (UTK) campus. It represents the most intense source of pulsed neutrons world-wide. Neutron scattering techniques are unrivaled in their ability to characterize the structure and dynamics of condensed matter.

The aim of this symposium is to illustrate the opportunities for chemists to use neutrons to address both fundamental and applied problems in molecular spectroscopy, geochemistry, biochemistry, energy and nanomaterials, catalysis, etc.

Larese joined the chemistry faculty at UTK as a Professor with a joint appointment at ORNL in 2001. In addition to his work in surface science and condensed matter he is also the principal investigator for the recently completed VISION neutron vibrational spectrometer at the SNS.

“One particular focus of the session will be to illustrate the capabilities of VISION a newly commissioned instrument at the SNS.” Larese wrote in the symposium abstract. “This spectrometer is the neutron analogue of a Raman-IR spectrometer with simultaneous diffraction capabilities. This next generation spectrometer conservatively offers 500 times higher throughput than the best comparable instrument in the world. VISION has been characterized by experts around the globe as a game changer.”
Deborah Penchoff, a recent graduate of the chemistry Ph. D. program at the University of Tennessee Knoxville (UTK), chaired the 2014 Gordon Research Seminar (GRS) on computational chemistry held at Mount Snow Resort in West Dover, Vermont, on July 19th and 20th, 2014.

Penchoff was selected during the 2012 Gordon Research Conference (GRC) to chair the inaugural GRS in her field. She worked with the GRC Chair and GRS co-chair to determine a theme for the conference, created a program, and eventually exceeded the funding target for the meeting.

“Being Chair of the Gordon Research Seminar on Computational Chemistry was an invaluable experience,” Penchoff said. “It allowed me to work closely with experts in the field, and to interact with scientists working at the frontier of the computational chemistry field. Organizing this conference gave me the opportunity to increase my knowledge in the many areas that computational chemistry currently encompasses, from development, to applications in materials, energy, and biological systems, amongst others, and furthermore provide a forum for others to network and learn.”

The Gordon Conferences have been recognized as the world’s premier scientific conferences, where leading investigators from around the globe discuss their latest work and future challenges. The Gordon Research Seminars are a series of highly successful and unique meetings that enable young researchers to share in the Gordon Research Conferences experience.

Penchoff grew up in Buenos Aires, Argentina. After working for several years at IBM as a financial analyst, Penchoff joined UTK chemistry department in 2008 pursuing a Ph.D. degree in physical chemistry, and graduated in 2013 with a minor in computational sciences. The research focus of her dissertation was “computational studies for optimization and design of separation agents for separation of lanthanides and actinides.” The body of research that Penchoff accomplished during her studies at UTK has lead to over a dozen presentations at ACS conferences, and Gordon Conferences, amongst others.

While a student at UTK, Penchoff received an Outstanding Teaching Award from the Student Affiliates of the American Chemical Society for her work as a teaching assistant in physical chemistry, and a teaching award from the department of chemistry for her work as a teaching assistant in general chemistry.

Penchoff considered this organizing experience, especially the mentoring session, as much rewarding to herself as to the other participants. “I enjoyed designing a conference program customized to early career computational chemists.” Penchoff said. “At this early stage in our careers in which we are focused on a specific area, I consider expanding our knowledge and being exposed to other areas in the field to be of particular importance. In addition, I paid particular attention to selecting experts in computational chemistry to participate in a career panel whom would represent industry, academia, and national laboratories. The Q&A session during the mentoring session of the conference was exceptional, in particular due to the career advice we received from the panelists. It was very gratifying to observe the high level of engagement and interest between the early career attendees and the senior panelists.

Chemistry graduate students participated in the Knoxville Susan G. Komen Race for the Cure on October 18th in the World’s Fair Park. The team of 7 finished the 5k run and raised over a thousand dollars. The Susan G. Komen Race for the Cure® Series is the largest series of 5k run/fitness walks in the world. Komen Knoxville has raised millions of dollars. 75% of revenue from this race stays in east Tennessee for breast cancer treatment and support, the other 25% funds research nationally.

Students participated in this year’s race include Laura Casto, Maggie Lookadoo, Amanda Clune, Alex Fisch, Adam Carr, Michael Merrill and Sam Mattem-Schain. The team was formed “in honor of family and friends afflicted by breast cancer,” Mattem-Schain said. “I love Race For The Cure and believe it does a tremendous amount of good for our community. It’s a wonderful awareness event and brings a lot of joy to the community of breast cancer survivors/victims and their families.”

*Information from KomenKnoxville website and e-newsletter.
Cameron Lee Received **TN-SCORE Best Poster Award**

Cameron Lee, a fourth year graduate student in Dadmun’s group, received one of three best poster awards from the annual TN-SCORE conference for his titled work “Conditions for the Formation of P3HT Organogel During Spin-Coating: Tuning Electrical Properties of Thin Films.” Lee was presented the award along with a $1000 travel stipend.

Lee’s poster highlighted research and results from a novel static light scattering instrument used to monitor the in situ onset and morphological evolution of a low bandgap, conjugated polymer used in organic photovoltaics and organic electronics, poly(3-hexylthiophene), during spin coating. Using this novel apparatus, specific processing conditions, such as solvent choice and composition, were correlated to the formation of organogel aggregates, aggregate size, and resultant electronic properties of the final film.

Lee’s research funding comes from TN-SCORE (Tennessee Solar Conversion and Storage using Outreach, Research and Education), a National Science Foundation EPSCoR RII Track I Research Infrastructure award. The program goal is to provide competitive research initiative to smaller undergraduate institutions in the state of Tennessee, but more importantly to provide a culture of collaboration among smaller schools and flagship schools like Vanderbilt University and the University of Tennessee Knoxville. The research is themed around three main thrusts: Advanced Solar Conversion, Devices for Energy Storage and Conversion, and Nanostructures for enhancing Energy Efficiency.

Lee was raised in the rural Appalachian town of Romney, West Virginia, a region known for its apple orchards and rolling hills. He earned his B.S. in chemistry at Wheeling Jesuit University, also receiving scholarship money to compete as a NCAA Division II multi-events athlete on the track and field team. Lee continued his interest in the sport after he joined UT chemistry department in 2010. He is now volunteering on the Vol and Lady Vol track and field team in his spare time. Enjoying all Knoxville has to offer, he has moved out of traditional housing, deciding instead to reside on a houseboat on the Tennessee River. After joining the Dadmun’s Group in 2011, Lee’s research has focused on the structure-property relationships of conjugated polymers for use in organic photovoltaics and electronic devices.

**Chemistry Graduate Students Won Top Fundraising Team Award**

A group of chemistry graduate students won Top Fundraising Team Award given by the American Cancer Society during the 2014 Tennessee Relay for Life event held on April 11th in Circle Park on the University of Tennessee Knoxville campus.

Chemistry team members include: Amanda Clune, Sam Mattern-Schain, Nolan Mitchell, Sam Rosolina, Jonathan Fong, Tess Kirchner, Amber Moody, Matt Dembo, Alexis Dale, Tanei Ricks, Eric Barrowclough, and Adam Carr.

“I want to stress that we had a lot more people than that come out to walk with us, and we had over 100 individual monetary donations to our team.” Rosolina, a third year graduate student in Xue’s Group and the Community Service Chair of Association of Chemistry Graduate Students said.

The chemistry team raised over $6,000 for the American Cancer Society which put them into third place out of forty teams for amount of money raised for the event. Out of a total of 1221 participants, Amanda Clune, a first year graduate student in Musfeldt’s Group, received the honor of top individual participant for most money raised. Overall, the entire event raised over $65,000 for the American Cancer Society.
Chemistry Alumni Named 2014 ACS Fellow

Chemistry Alumni Arlene Garrison and James Carver were inducted into 2014 American Chemical Society (ACS) Fellows during the 248th ACS National Meeting held in San Francisco, CA from August 10 to 14, 2014.

Carver received a B.S. degree in Chemistry from Centenary College of Louisiana in 1963, a Ph.D. in Chemistry from the University of Tennessee in 1972. After graduating from UTK, he conducted post-doctoral research at the University of Georgia. Carver remained at UGA as an instructor in the chemistry department for a year, after which he accepted a position as assistant professor of chemistry at Texas A&M University. After three years at TAUM, Carver was recruited to EXXON Research and Development Laboratories in Baton Rouge, LA. In 1986, he ‘retired’ from EXXON and entered law school at LSU. After graduating with a J.D. degree in 1989, Carver spent about 20 years with the law firm of Taylor Porter Brooks and Phillips in Baton Rouge, and in 2011 he opened his own firm, The Carver Law Firm.

Garrison received her Bachelor’s degree in college scholars in 1975 and earned her Ph.D. in chemistry in 1981 both from UTK. In her 40 years of experiences as a scientist and educator, Garrison served as the associate vice president of research at UT; a program director for the National Science Foundation assigned through an interagency agreement with UT, and was appointed as the vice president of university partnerships at Oak Ridge Associated Universities (ORAU) in May, 2010.

Taking picture with them, also an ACS fellow (2011) was Diane Schmidt, chemistry alumna and member of Board of Visitors. Schmidt was elected as 2014 ACS president last year and was previously awarded Henry Hill Award from ACS. She is now an adjunct professor at the University of Cincinnati.

CHEMISTRY ALUMNA INVITED TO THE WHITE HOUSE

Chemistry alumna, Diane Schmidt, was invited to the White House for the National Medal of Technology and the National Medal of Science presentations on Thursday, November 20. A gala will be held at the Ritz Carlton Pentagon City to celebrate the award recipients. Earlier this year, Schmidt was elected the President of American Chemical Society for the coming year of 2015.
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Calendar

Spring 2015
- Classes Begin: Jan 07
- MLK Holiday: Jan 19
- Spring Break: Mar 16-20
- Spring Recess: April 03
- Classes End: April 24
- Exams: April 28-30, May 1-4, 5
- Commencement: May 6-9

Fall 2015
- Classes Begin: Aug 19
- Labor Day: Sept 07
- Fall Break: Oct 15-16
- Thanksgiving: Nov 26-27
- Classes End: Dec 01
- Exams: Dec 3, 4, 7-10
- Graduate Hooding: Dec 10
- Commencement: Dec 11

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- Dr. Frank Vogt, Associate Department Head

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- Physical, Dr. John Larese: 974-3429
- Polymer Dr. Jimmy Mays: 974-0747

Administration
- Main Office: 974-3141
- Business Office: 974-3393
- Electronic Shop: 974-3145
- Communications: 974-8019

Research Centers
- NMR Facilities: 974-3386
- PCL Lab: 974-2087
- Mass Spectrometry: 974-0763
- Raman Facilities: 974-3141
- X-ray Facilities: 974-3141

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