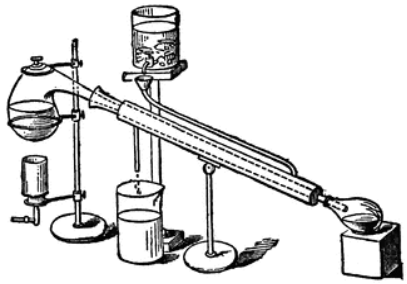
SOUTHWEST RETORT



SIXTY-NINTH YEAR **SEPTEMBER 2016**

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and Chemistry in this area

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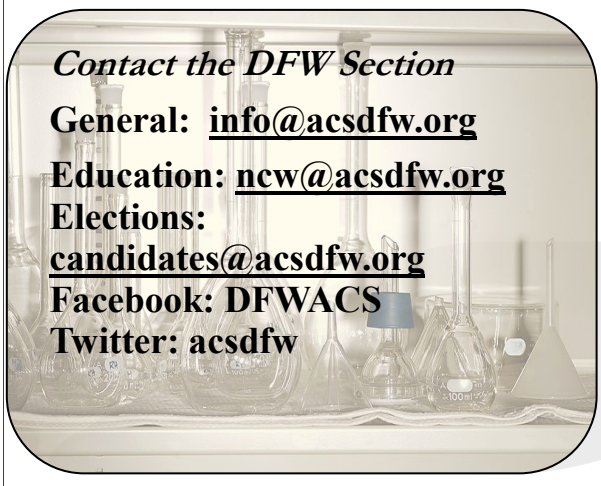

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Education: ncw@acsdfw.org

Elections: candidates@acsdfw.org

Facebook: DFWACS

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EMPLOYMENT CLEARING HOUSE

Job applicants should send name, email, and phone, along with type of position and geographical area desired; employers may contact job applicants directly. If you have an opening, send your listing, including contact info for your company, to retort@acsdfw.org. Deadlines are the 7th of each month.

JENKEM TECHNOLOGY

The PEG and PEGylation Technology People

POSITIONS AVAILABLE

Quality Manager, GMP Manufacturing
Location: Tianjin, China.
JenKem Technology Co. Ltd. has a current opening for a Quality Manager position for GMP manufacturing of polyethylene glycol polymers in Tianjin, China. The ideal candidate must have:
Excellent communication skills in English and Mandarin (Chinese)
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Proven leadership skills in a quality management position
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Project Manager, GMP Manufacturing
Location: Beijing or Tianjin
General Manager, GMP Manufacturing Plant
Location: Tianjin
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Daily responsibilities including leading customer conference calls, providing project updates, coordination of information flow, coordination of resources, resolution of issues between customer and JenKem Technology, writing project reports, and tracking project deliverables, scope, costs and schedules.
Provide leadership to facilitate problem solving and decision making. Recommend solutions for addressing project related problems.
Maintain direct involvement with other departments within JenKem Technology to help develop specifications, provide information required for analytical methods, contribute information for GMP related documentation such as investigations, batch records and reports and translate contract requirements for JenKem Technology departments.
Advanced degree in Chemistry, Chemical Engineering, or a scientific related field of study. Knowledge of organic, polymer and analytical chemistry.
Previous working knowledge of cGMP manufacturing in the US or Europe, preferably polymer-related or pharmaceutical manufacturing.
Outstanding demonstrated interpersonal skills in English and Mandarin (Chinese) a must (both written and oral)
Proven aptitude for project management tools. Proficiency using project management tools to oversee all elements of project lifecycle including scheduling/planning, meeting coordination, tracking of costs and deliverables, reporting to stakeholders, and risk mitigation. Project Management Certification a plus.
Computer and software skills including MS Office Suite programs, Internet, email systems required.
Proven multi-tasking skills able to handle multiple projects simultaneously within a GMP environment; ability to motivate teams, work within aggressive timelines collaboratively with cross-functional departments
Demonstrated ability to work as a strong contributor in a team environment on complex projects.
Required skills include strong communication, leadership, decision-making, organizational and analytical skills. A candidate must be able to maintain customer focus, handle difficult discussions, build consensus, work independently and prioritize multiple tasks and adjust quickly, as needed. The ideal candidate must be willing to pursue tasks that may be required for projects but are not clearly defined within this job description.
Detail-oriented, dependable, motivated, ability to work with minimal supervision.
Interested candidates should submit a cover letter including salary expectations; and an updated resume at email: hr@jenkemusa.com.

hr@jenkemusa.com.

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Fort Worth

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The ACS Southwest Regional Meeting will be held in Albuquerque, New Mexico Nov. 30-Dec. 2. The General Chairman is **Dr. Robert A. Pennerman** and the Technical Program Chairman is **Dr. Joseph A. Leary.** Both Chairmen are from the Los Alamos Scientific Laboratory. The meeting will feature an address by **Dr. Glenn T. Seaborg**, the Chairman of the US Atomic Energy Commission.

The ACS Ark-La-Tex Section continues to attract new industries employing chemists. The new $15 million Schlitz Brewing Co. plant in Longview, TX, was dedicated July 22. Nekoosa-Edwards Paper Co. broke ground for a $46 million pulp and paper mill July 13 at Ashdown, AR. More than $3 million will be spent for expanding and modernizing the Universal Oil Products plant north of Shreveport. There are also three new colleges in Shreveport. LSU is opening a branch campus as is Southern University, while the new Baptist Christian College graduated its first class last June. **Dr. Wayne Hanson** was appointed Head of the Chemistry Department at Centenary College last June.

In the Panhandle Plains ACS Section, **Dr. R. T. Sanderson** presented a series of lectures as visiting scientist at West Texas State College. Sanderson was formerly at the University of Iowa but is now at Arizona State University. He is well known for proposing an electronegativity scale based on covalent radii of the elements. At Amarillo College the recently constructed $50,000 science building has been named the Warren Hall of Science in honor of **Miss Bertie Warren**, long-time chemistry teacher at the college. This is the first time such an honor has been bestowed by the regents on a living person. Miss Warren is a longtime member of the Panhandle Plains ACS Section.

In the Southeastern ACS Section, the Awards and Nominations Committee has submitted the names of the following people for ACS awards: Priestly Medal, **Dr. Kenneth Pitzer**, Rice; ACS Award in Chromatography and Electrophoresis, **Dr. Albert Zlatkis**, University of Houston; ACS Award in Inorganic Chemistry, **Dr. John Margrave**, Rice; James Bryant Conant Award in High School Chemistry Teaching, **Mrs. Alice Johnsen**, Bellaire High School; Southwest Regional Award, **Dr. Richard B. Turner**, Rice.

At Baylor **Dr. Farrington Daniels** of the University of Wisconsin visited the campus representing Sigma Xi on an inspection of the science departments.

At the University of Arkansas, **Dr. Edward Amis** became an author again with the publication of his book *Solvent Effects on Reaction Rates and Mechanisms*.

Compiled by E. Thomas Strom

The Earth's Energy Balance: An Engineer's Perspective

By

John E. Spessard, PE

A plant or process will routinely establish mass and energy balances. These balances provide insights as to the fate of mass and energy in the plant. This allows for more efficient operation because areas for process control and improvement become apparent.

In the same sense mass and energy balances for our earth can be constructed. Both mass and energy balances are at or very near being in balance. A gain in mass could result from a large meteor striking the earth. However, the upset would be the energy of the projectile. I will focus on energy balances.

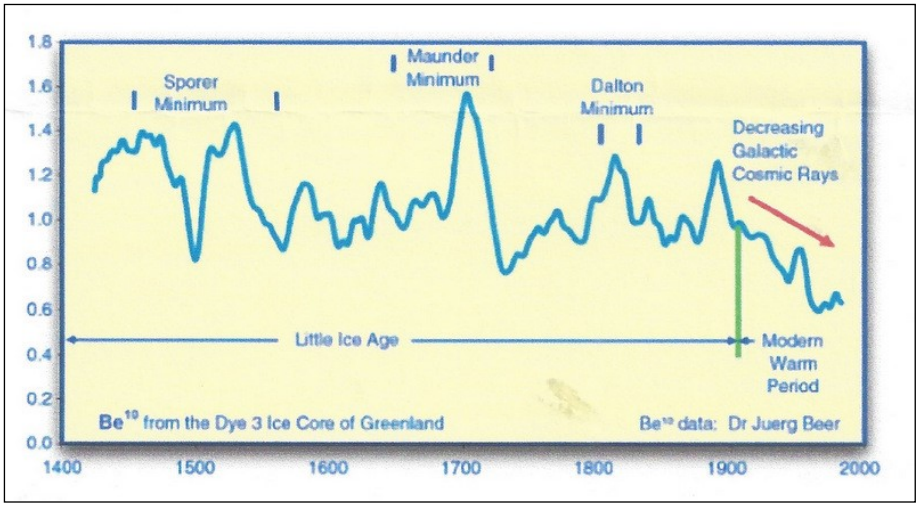
The earth is largely in energy balance. If this were not so, we would be becoming significantly either warmer or colder. Small fluctuations could be serious. Since late 1978, satellites have directly measured the energy received from the sun. Over this 38-year period, the result has been 1362 watts plus or minus one per square meter. One side of the earth always faces the sun. For the earth's surface, the AVERAGE is 340 watts per square meter. Energy from the earth's interior is estimated at 0.087 watts per cubic meter. The 38 years of data have provided a conclusion that the Sun's energy output has always been constant.

The radiation emitted by a body is proportional to its temperature to the fourth power. The sun's photosphere is at about 5870 Celsius and the chromosphere and corona are hotter yet. Consequently, some of the sun's radiation is in the ultraviolet, extreme ultraviolet and X-ray portion of the spectrum. The earth also radiates energy to space at the fourth power of the temperature. But at an average temperature of 15 Celsius, this radiation is in the infrared portion of the spectrum.

Between three and five percent of the sun's radiation is in wavelengths of 300 and shorter nanometers. Fortunately for mankind, much of this radiation is absorbed by the ozone layer. Some of this energy generates replacement ozone. About 50% of the incoming energy is absorbed by the earth's surface, about 20% is absorbed by the atmosphere and clouds and about 30 % is directly reflected back into space by clouds. This is variable by site. For example, ice reflects better than dirt or water. Some of the solar energy through photosynthesis converts CO_2 to O_2.

Please note that the atmosphere and clouds both absorb and reflect solar radiation. Chapter 7 (2013 edition) of the United Nations Intergovernmental Panel

on Climate Change reports "Clouds and aerosols continue to contribute the largest uncertainty to estimates and interpretations of the Earth's changing energy budget." Since aerosols and clouds have a two-way effect, improved understanding is mandatory. Chapter 7 also states "The quantification of cloud and convective effects in models, and of aerosol -clouds interactions continue to be a challenge. Climate models are incorporating more of the relevant processes than at the time of AR4 (2008 edition) but confidence in the representation of these processes remains low."



Sun spots may be a factor. Sun spots have been observed and studied for over 400 years starting with Galileo's telescope. There is an accepted 11-year cycle between maximum and minimum sunspot activity. Other longer cycles have been postulated but not universally accepted. The 11-year cycle is sufficiently accepted that Rudolf Wolf (1816 -1893) defined 1755-1766 as Cycle 1. Cycle 24 is from January 2008 to 2019. The Maunder Minimum was from 1645-1715 and was a period of very low sunspot activity and very low earthly temperatures. There is a Modern Maximum from 1900 to the present which corresponds to higher sunspot levels.

Sun spots are dark places on the sun's surface. They are cooler (relatively) than the rest of the sun. However there are also places on the sun that are warmer than usual. The result is a slight increase in solar activity during heavy sun -spot periods and lower output during light sunspot periods. Sunspots are generated by the sun's magnetic field. The warmer areas provide a significant increase in high level radiation. Fortunately for mankind, this higher energy radiation is absorbed by the Earth's ozone layer. These levels provide a mechanism for studying past sunspot levels. The brighter and hotter areas of the sun do not show up well on conventional photographic plates. There are about 60,000 photographic plates taken over the past 100 years. These plates focus on the calcium II line and may permit better observation of high energy areas of the sun. Natalie Krivova has assigned her graduate student, Theodosios Chatzistergos, the task of examining these plates.

The sun's magnetic field influences our climate. (Understanding of the solar magnetic field is incomplete.) A strong-

er magnetic field makes the solar wind stronger. In turn this deflects cosmic rays. Cosmic rays cause the formation of carbon-14 and beryllium-10. With a stronger solar magnetic field and solar wind, smaller quantities of carbon-14 and beryllium-10 are formed. While carbon-14 diffuses into our atmosphere and is taken up by the global carbon cycle, beryllium-10 falls to earth and has been incorporated into the Greenland ice sheet.

With a stronger solar magnetic field and solar wind, more cosmic rays are deflected from the earth. This lowers Be-10 and C-14 production. With a weaker solar magnetic field and solar wind, fewer cosmic rays are deflected and Be-10 and C-14 production increases. Higher Be-10 and C-14 levels indicated lower earthly temperatures and vice versa. The plot of Be-10 levels between 1400 and 1974 illustrates this. David Archibald plotted beryllium-10 levels and demonstrated that higher beryllium-10 levels (lower solar magnetic field) correlated with global temperature cycles from about 1420 to 1974 CE.

This level of energy balance understanding would be insufficient to justify building a multimillion dollar plant.

DFW Councilor's Report— 252nd ACS National Meeting

By Jason L. McAfee

Last Fall, I was honored by this section to be elected as councilor. This is my first councilor's report, but my second experience attending a national meeting as your councilor. The meeting was held in Philadelphia, PA, on August 21 -25, 2016. My fellow councilors in attendance were Tom Strom, Linda Schultz, and Denise Merkle.

Before I go into the details of the report, CONGRATULATIONS are in order for our local section! We won TWO Chemluminary Awards.

The Committee on Environmental Improvement awarded us a Chemluminary under Outstanding Sustainability Activities for our financial support of and involvement in the "Climate Science is the Answer, but What are the Questions" symposium hosted by Texas Wesleyan University on August 1, 2014.

The Committee on Local Section Activities awarded us a Chemluminary under Outstanding Performance by a Local Section – Medium Large Size Category for our National Chemistry Week activities which reached 3,275 people and involved 195 volunteers and our Spring Awards banquet.

A big THANK YOU to all of those involved and CONGRATULATIONS!

Fall meetings are typically not as well attended as Spring meetings, and this year was no exception with an official attendance of 12,989. However, this number is down compared to previous national meetings in coastal cities. Over the past 9 Fall meetings, only Denver and Indianapolis drew fewer people. Perhaps this is due to the timing of the meeting – several campuses were in their first week of the Fall semester. Of course, the lower attendance might be a reflection of the current state of the economy or ever increasing cost of national meeting attendance.

Here are some of the highlights of the Council Meeting of August 24:

To the Council Policy Committee, Council elected to a 3-year term Harmon Abrahamson, Lissa Dulany, Andrea Twiss-Brooks and Sally Peters, to a 2-year term Martin Rudd and to a 1-year term Karl Booksh and Ella Davis.

To the Committee on Nominations and Elections, Council elected to a 3-year term Lisa Balbes, Thomas Lane, Amber Hinkle, Alan Ehrlich and Alan Hazari, and to a 1-year term Neil Jesperen.

To the Committee on Committees, Council elected to a 3-year term Wayne Jones, Richard Cobb, Stephanie Watson, Dee Ann Casteel, and Emilio Esposito.

The Committee on Committees recommended and Council approved to continue the Committee on Analytical Reagents and the Committee on Chemical Abstract Services.

The Committee on Local Section Activities recommended and the Council approved the annexation of the previously unassigned counties of Pecos and Brewster into the Permian Basin Local Section.

The Committee on Membership Affairs recommended and the Council approved to extend the waiver of unemployed members' dues from two year to three years.

The Committee on Economic and Professional Affairs recommended and the Council approved Chemical Professional's Code of Conduct.

The Committee on Constitution and Bylaws recommended and Council approved the Bylaws for Divisions in Probationary Status and the Charter Bylaws for New Local Sections.

The Committee on International Activities recommended and Council approved the establishment of the ACS International Chemical Sciences Chapters in Greater Bejing, Southwest China, and Iraq.

The Committee on Nominations and Elections is looking for nominations for President-Elect and/or Directors. You may send your suggestions to **nomelect@acs.org**.

N&E has also established the Vote 20/20 Task Force to examine all aspects of nominations and elections for ACS national officers, and designing an enhanced process to be in place by 2020. If you have suggestions to improve/change the process, please email **vote2020@acs.org**.

The Committee on Budget and Finance reports that the Society is projected to Net $17.3 million from operations, which is $3.9 million higher than budgeted, but only $723,000 higher than 2015. Total revenues are projected to be $528.8 million, which is 3.3% higher than 2015. B&F recommended and the Board approved funding the Atlantic Basis Conference on Chemistry, the ChemIDP Program, and the International Student Chapter Program. B&F recommended and the Board approved the advanced member registration fee of $445 for national meetings held in 2017.

Speaking of future meetings, the 253rd national meeting is scheduled for April 2-6, 2017, in San Francisco, CA. Abstract submission is now OPEN (callforpapers.acs.org/sanfran2017) with a deadline of October 31, 2016, for all divisions except of Chemical Education, whose deadline is November 7. The theme for this meeting will be "Advanced Materials, Technologies, Systems and Processes."

Please email me your comments, questions, or suggestions **jason.mcafee@gmail.com**.

From the ACS Press Room

Probing a mosquito protein for clues in the fight against Zika

Solution Nuclear Magnetic Resonance Studies of Sterol Carrier Protein 2 Like 2 (SCP2L2) Reveal the Insecticide Specific Structural Characteristics of SCP2 Proteins in Aedes Aegypti Mosquitoes

Biochemistry

As health departments around the U.S. boost efforts to combat Zika, scientists are working on new ways to kill the mosquitoes that carry the virus. One approach involves understanding the molecular mechanisms that keep the bugs alive so we can then undermine them. Scientists report in the ACS journal *Biochemistry* that they have revealed new structural insights on a key protein from *Aedes aegypti*, the mosquito species most often linked to the spread of Zika.

In February, the World Health Organization called for action against the disease after Brazil experienced a spike in the number of babies born with microcephaly, a condition characterized by an abnormally small head. Since then, the virus has been reported in more than 40 countries. Studies have shown that compounds that inhibit a protein called sterol carrier protein 2 (SCP2), which is involved in the transport of cholesterol and fats in insects, can kill *Aedes aegypti* larva. Kiran K. Singarapu and colleagues from CSIR - Indian Institute of Chemical Technology wanted to take a closer look at the

Scientists reveal new insights into a protein from Aedes aegypti that could help us fight it and the diseases it carries.
Credit: CDC/James Gathany

structure of one of the protein's variants to help inform the development of future insecticides.

Using solution nuclear magnetic resonance, a technique that yields molecular-level information about proteins, the researchers were able to describe the 3-D structure and dynamics of a SCP2 variant. The new insights could help scientists screen small-molecule libraries for insecticide candidates. In addition to curbing Zika, any resulting compound that stamps out *Aedes aegypti* could reduce cases of other illnesses — dengue fever, yellow fever and chikungunya — that the mosquito also carries.

The authors acknowledge funding from the Department of Science and Technology of India.

Letter from the Chair-Elect

Dear ACS DFW colleagues,

I hope you all had a great summer! It's an exciting time to be involved in the DFW section. We received two Chemluminary Awards at the ACS National Meeting, and we have a lot of great events planned for this Fall!

The first Chemluminary is an Outstanding Sustainability Activities Award for the Climate Change Workshop held at CAST (Conference for the Advancement of Science Teaching). This workshop was organized by Dr. Bob Landolt, Emeritus Professor at Texas Wesleyan University, the Climate Science Activities Coordinator for the local section. Congratulations Bob and thanks for all of your hard work! The second Chemluminary is the Outstanding Performance by a Local Section – Medium Large Size. Congratulations and thanks to the Past Chair, Shana Santos, and the Chair, Steven Twaddle, for all of their hard work in 2015 that led to this award!

This summer and fall will be busy for our local section. Even with the rain delay, we had a great time at the Frisco Rough Riders game in August. This month we'll be honoring our Doherty Award Winner, Dr. Elfi Kraka of SMU, on September 16. In October we will be honoring our Schulz Award Winner, Ms. Gale Hunt of Hebron High School (tentative date October 18 in Plano). I'm sure many of you will be celebrating National Chemistry Week in October with a variety of events around the local section. In November we will be touring a brewery (date TBA).

I hope to see you at our meetings this fall!

-Katie Walker

2016 Chair-Elect

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2016 Doherty Award Winner

Professor Elfi Kraka of SMU

On Friday, September 16, professor Elfi Kraka of SMU received the 2016 Doherty Award at a meeting held at SMU.

Elfi Kraka joined the Department of Chemistry at Southern Methodist University (SMU) as Professor and Chair in 2009. She received her doctorate in Theoretical Chemistry at the University of Cologne, Germany, in 1985. After postdoctoral stays at the University of Cologne and the Argonne National Laboratory, she joined the Department of Chemistry at Goteborg University, Sweden, in 1990, rising through the ranks to Full Professor. In 2005 she accepted a position as Professor and Chair of Chemistry at the University of the Pacific, Stockton, CA, USA. She is the co-founder of the Computational and Theoretical Chemistry Group at SMU, offering a unique PhD curriculum in Computational Chemistry, and succeeded in bringing the famous Austin Symposium on Molecular Structure and Dynamics to Dallas.

Kraka's presentation was entitled *A New View on Chemical Reactions –"Riding" the Reacting Complex Through the Reaction Valley into the Energy Mountains.* Controlling chemical reactions is one of the ultimate goals in chemistry. This implies that we understand how a catalyst lowers the energy barrier of a chemical reaction and makes the reaction stereospecific. The CATCO group has developed as a unique tool for this purpose the "Unified Reaction Valley Approach" (URVA). We swing onto the back of the reacting molecules, unified in the form of the reaction complex and "ride" the reaction complex along the path it follows through the reaction valley. While the reaction complex changes, thousands of snapshots are taken and combined to a reaction movie. As the steepness and curving of a hiking path define the energy one has invest to get to the other side of the mountains, the curving of the reaction path discloses important features of the chemical reaction, which, once understood, can be used to design new reactions with improved energetics and stereochemical properties. So far, we have studied about 200 homogeneous catalysis reactions (including Ti, Fe, Ni, Cu, Zr, Rh, Pd, Hf, Re, Pt, and Au catalysts). I will demonstrate how comparing the URVA analysis of non-catalyzed and catalyzed reactions leads to a wealth of information for de novo catalyst design.

Around the Area

Tarleton State

We are proud to report that the Chemistry Program at Tarleton State University is now officially recognized as an accredited program by the American Chemical Society.

Dr. Arthur Low is now Associate Dean of the College of Science and Technology. **Dr. Rajani Srinivasan** has been promoted to Department Head.

The Student Affiliate Chapter was recognized as a Commendable Chapter at the San Diego National ACS Meeting in March. **Dr. Bernat Martinez, Dr. Michele McAfee, and Dr. Linda Schultz** attended the August National Meeting in Philadelphia with undergraduate students presenting research talks and posters.

University of Arkansas

Arkansas cleaned up the poster awards in the area of "electrochemistry" at the 229th Electro-chemical Society Meeting in San Diego, May 29 - June 2. First place went to **Mahsa Lotfi-Marchoubeh** and second place was awarded to **Leanne Mathurin**. They appeared in "photo of the day," a feature of the daily announcements section of the meeting's newsletter. Mahsa is directed by Ingrid Fritsch, and Leanne is a student of Jingyi Chen. Professor **Ingrid Fritsch** reported from the conference that she had heard the most complimentary statements from the judges. All of the UA presenters were so good that the decision from the judges was unanimous. They also commented that all the posters from Arkansas were also very good. Poster presenters were **Mahsa Lotfi- Marchoubeh**, **Leanne Mathurin**, **Jonathan Moldenhauer**, **Foysal Khan**, **Ben Jones**, and **Casey Einfalt** (Ingrid's 2015 REU student from John Brown University). The first-year graduate students who were also a part of the group were **Jazlynn Wisener**, **Aaron Nicholson**, **James Lowe**, and **Zeb Schichtl**.

Publications

Benard Omogo, **Feng Gao**, **Pooja Bajwa**, **Mizuho Kaneko**, **Colin D. Heyes**. Reducing Blinking in Small Core-Multishell Quantum Dots by Carefully Balancing Confinement Potential and Induced Lattice Strain: The "Goldilocks" Effect. 2016 *ACS Nano* 10, 4072-4082.

Morris, J., **S. Jayanthi**, **R. Langston**, **A. Daily**, **A. Kight**, **D.S. McNabb**, **R. Henry**, **T.K.S. Kumar** (2016) Heparin -binding peptide as a novel affinity tag for purification of recombinant proteins. *Protein Expression & Purification*, 126, 93-103.

Salisbury, Lutishoor and Gwendolyn Mattice. 2016. Early exposure to the Scientific Research Process through Collaboration with Chemistry Faculty and the Science Librarian. *Science and Technology Libraries*. 35(2), 119-135. http://www.tandfonline.com/

doi/ pdf/10.1080/0194262X.2016.1162118. DOI:10.1080/019426X.2016.1162118.

Salisbury, Lutishoor and **Julie Speer**. 2016. Science and Technology Librarians: User Engagement and Outreach Activities in the Area of Scholarly Communication. Issues in Science and Technology Librarianship, Winter. http://www.istl.org/16-winter/refereed4.html DOI:10.5062/F45X26ZR.

Congratulations to **Dustin Baucom**, **Jonathan Moldenhauer**, and **Matthew Moudy**, who will each receive $1000 as the recipients of the 2015-2016 Wally-Cordes Teaching Award. This award was established in 1984 by A. Wallace and Doris Cordes to recognize teaching assistants who excel in the classroom. **Dr. Cordes**, otherwise known as Wally, retired in 2003 after 43 years of teaching, research, and service. He helped found a center at the University of Arkansas to improve teaching effectiveness which today bears his name – the Wally Cordes Teaching and Faculty Support Center. Dustin's advisor is Colin Heyes, Jonathan's is David Paul, and Matt's is Wesley Stites.

UTD

Stephanie Taylor was appointed as co-Regional Director of the Associated Chemistry Teachers of Texas at the January Board meeting in San Antonio, joining Diana Mason (retired).

TWU

In recognition of his long standing contributions to the field of biothermodynamics and his fervent dedication to students, **Richard D. Sheardy**, Professor and Chair of the Department of Chemistry and Biochemistry at Texas Woman's University, has been named Conference Chair for the North American Calorimetry Conference (CALCON). For over 35 years, Sheardy has shared his knowledge and enthusiasm for chemistry with students at Penn State University, Seton Hall University and, since 2006, at Texas Woman's University (TWU). In addition, Sheardy has been recognized as a Leadership Fellow for his efforts in science education because of his work with the National Center for Science and Civic Engagement, and is a TWU Senior Experiential Learning Fellow. Sheardy has organized several symposia for the national meeting of the ACS in the Division of Chemical Education. He has published over 50 papers, mostly reporting his research on the structural and thermodynamic properties of DNA, and edited two books based on ACS symposia.

Since its inception in 1945, CALCON has served as the premier collegial forum for the dissemination of current research and state-of-the-art technological developments in calorimetry and thermodynamics. CALCON participants represent a broad cross-section of international scientists in academia, government, and industry

whose research interests span a diverse range of disciplines within the fields of biology, chemistry, physics, engineering, and emerging frontiers at the interface of core technologies. As Conference Chair, Sheardy will be responsible for organizing various symposia within the annual conference; managing nominations, selection and presentation of four awards presented annually; and, working with sponsors for the annual conference. Sheardy will also be involved in planning for the joint meeting with the International Conference on Chemical Thermodynamics (ICCT) in 2018, the 75th Anniversary of CALCON in 2020 and the next joint meeting with the Japan Society of Calorimetry and Thermal Analysis (JSCTA) in 2021.

UT-Arlington

Professors Sandy Dasgupta and **Kevin Schug** have received Tech Titan awards. These awards are given by the Technology Association of North Texas. Dasgupta was given the Tech Titans Technology Inventors Award for his numerous innovations in chemical and environmental analysis. Schug, along with UTA biology professor **Laura Mydlarz**, was given the Tech Titans of the Future University Level Award for leadership in the Achieving Success in Science through Undergraduate Research and Engagement (ASSURE) program.
Professor Krishnan Rajeshwar is now serving as President of the Electrochemical Society.

Associate Professor Robin Macaluso was a speaker at an ACS Division of Inorganic Chemistry Symposium held at the recent ACS national meeting in Philadelphia. In the symposium titled "Young Investigators. Where Are They Now," she spoke on "Rare-Earth Intermetallics and Beyond: A Solid-State Chemistry Career in BS and PhD Programs."
Dr. Schug gave an oral presentation and his co-worker, **Dr. Doug Carlton**, presented two posters at the International Symposium on Chromatography 2016 in Cork, Ireland. Dr. Schug also gave an invited presentation at a symposium held at the Philadelphia ACS national meeting in honor of **Professor Harold McNair**, winner of the 2016 ACS Award in Chromatography. He was the Ph.D. mentor of Dr. Schug.

Department of Chemistry and Biochemistry
Texas Woman's University
Seminar Schedule Fall 2016

Sept 16	Dr. Keith Miller, University of Denver
Sept 30	Dr. Jason Slinker, UTD
Oct 21	Dr. John Beatty, Texas Woman's University
Oct 28	Dr. Andrew Fischer, Abbott Laboratories
Nov 4	Dr. Ronald J. Rahaim, Oklahoma State
Dec 2	Dr. Enrique Dilone, Amicus Therapeutics

From the ACS Press Room

Ginger and chili peppers could work together to lower cancer risk

Gingerol Reverses the Cancer-Promoting Effect of Capsaicin by Increased TRPV1 Level in a Urethane-Induced Lung Carcinogenic Model
Journal of Agriculture and Food Chemistry

For many people, there's nothing more satisfying than a hot, spicy meal. But some research has suggested that capsaicin, the compound that gives chili peppers their kick, might cause cancer. Now researchers show in mouse studies that the pungent compound in ginger, 6-ginergol, could counteract capsaicin's potentially harmful effects. In combination with the capsaicin, 6-gingerol could lower the risk of cancer, they say. The study appears in ACS' *Journal of Agricultural and Food Chemistry*.

The mouth-tingling combination of chili peppers and ginger helped stave off lung cancer in mice. Credit: Clemmesen/Shutterstock.com

Both chili peppers and ginger are widely used spices in certain cuisines, particularly in Asia, and have been studied for potential health effects. Although some studies have shown that peppers can have benefits, others suggest that diets rich in capsaicin might be associated with stomach cancer. Ginger, however, has shown promise as a health-promoting ingredient. Oddly enough, capsaicin and 6-gingerol both bind to the same cellular receptor — one that is related to tumor growth. Jiahuan Li, Gangjun Du and colleagues wanted to further investigate this apparent contradiction.

Over several weeks, the researchers fed mice prone to lung cancer either capsaicin or 6-gingerol alone, or a combination of both. During the study period, all of the mice that received only capsaicin developed lung carcinomas while only half of the mice fed 6-gingerol did. Surprisingly, an even lower percentage — only 20 percent — of the mice given both compounds developed cancer. The researchers also dug into the potential molecular underpinnings of how the compounds interact to lead to this effect.

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From the ACS Press Room

Selecting the right house plant could improve indoor air (animation)

PHILADELPHIA, Aug. 24, 2016 — Indoor air pollution is an important environmental threat to human health, leading to symptoms of "sick building syndrome." But researchers report that surrounding oneself with certain house plants could combat the potentially harmful effects of volatile organic compounds (VOCs), a main category of these pollutants. Interestingly, they found that certain plants are better at removing particular harmful compounds from the air, suggesting that, with the right plant, indoor air could become cleaner and safer.

Bromeliad plants are good at removing a wide variety of VOCs from the air.

Courtesy of Vadoud Niri

The researchers presented their work tat the 252nd National Meeting & Exposition of the American Chemical Society (ACS).

"Buildings, whether new or old, can have high levels of VOCs in them, sometimes so high that you can smell them," says Vadoud Niri, Ph.D., leader of the study.

VOCs are compounds like acetone, benzene and formaldehyde that are emitted as gases and can cause short- and long-term health effects when inhaled. They can come from paints, furniture, copiers and printers, cleaning supplies and even dry-cleaned clothes.

"Inhaling large amounts of VOCs can lead some people to develop sick building syndrome, which reduces productivity and can even cause dizziness, asthma or allergies," Niri says. "We must do something about VOCs in indoor air."

The most common solution is to install ventilation systems that cycle in air from outside. There are also methods that can remove these compounds, using adsorption, condensation and chemical reactions.

However, Niri is studying a cheap, simple tool to remove VOCs: house plants. Using plants to remove chemicals from indoor air is called biofiltration or phytoremediation. In addition to carbon dioxide, plants can take up gases such as benzene, toluene and other VOCs. NASA began studying this option in 1984 and found that plants could absorb these airborne

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compounds via their leaves and roots.

Since then, other studies have looked at how plants phytoremediate specific compounds, such as the carcinogen formaldehyde, in a closed space. Most of these studies focused on the removal of single VOCs by individual plants from the ambient air. However, Niri wanted to compare the efficiency and the rate of simultaneous removal of several VOCs by various plants.

To test this, Niri, who is at the State University of New York at Oswego (SUNY Oswego), and his team built a sealed chamber containing specific concentrations of several VOCs. They then monitored the VOC concentrations over several hours with and without a different type of plant in the chamber. For each plant type, they noted which VOCs the plants took up, how quickly they removed these VOCs from the air, and how much of the VOCs were ultimately removed by the end of the experiment.

The researchers tested five common house plants and eight common VOCs, and they found that certain plants were better at absorbing specific compounds. For example, all five plants could remove acetone — the pungent chemical that is abundant at nail salons — from the air, but the dracaena plant took up the most, around 94 percent of the chemical.

"Based on our results, we can recommend what plants are good for certain types of VOCs and for specific locations," Niri says. "To illustrate, the bromeliad plant was very good at removing six out of eight studied VOCs — it was able to take up more than 80 percent of each of those compounds — over the twelve-hour sampling period. So it could be a good plant to have sitting around in the household or workplace."

Niri says the next step in the research is to test these plants' abilities in a real room, not just a sealed chamber. He would eventually like to put plants in a nail salon over the course of several months to see whether they can reduce the levels of acetone to which workers are exposed.

He acknowledges funding from SUNY Oswego's Scholarly and Creative Activity Grants.

The American Chemical Society is a nonprofit organization chartered by the U.S. Congress. With nearly 157,000 members, ACS is the world's largest scientific society and a global leader in providing access to chemistry-related research.

Watch the video about reducing indoor pollution

From the editor

Summer break...it is interesting how ingrained a summer break is to our society. Even those of us not in nine month positions go on summer vacation, have plant maintenance and shutdown...lawyers and judges are out in August, almost without exception (I have never testified in court in July or August). Anyway, the RETORT is back from the summer break, and in its sixty-ninth year.

For me, the most interesting article in this issue involves house plants and VOC reduction. The word is phytoremediation, says Vadoud Niri of SUNY Oswego. Best so far? Dracaena. Watch the video; the link is on page 20.