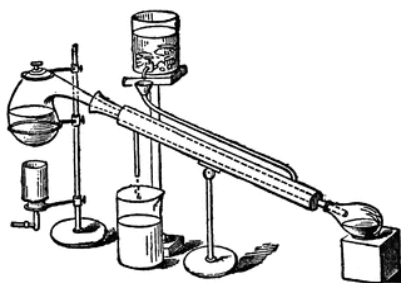




# ***SOUTHWEST RETORT***



**SIXTY-SEVENTH YEAR**

**SEPTEMBER 2014**

*Published for the advancement of  
Chemists, Chemical Engineers  
and Chemistry in this area*

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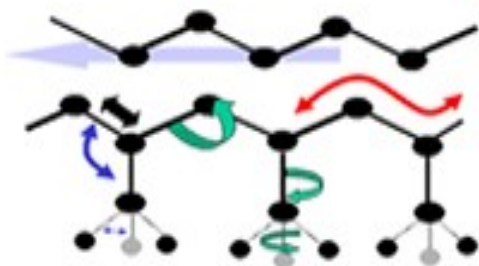
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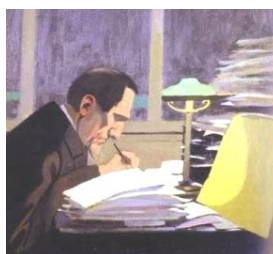
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## *FIFTY YEARS AGO IN THE SOUTHWEST RETORT*

The Baton Rouge ACS Section presented the annual Charles E. Coates Award to Alex Voorhies, Jr., Director the Esso Research Laboratories in Baton Rouge, in recognition of his contributions to the field of petrochemical research. The award was established by the local ACS and AIChE sections in honor of the late Dr. Charles E. Coates, long time head of the LSU chemistry department.

The officers of the Brazosport ACS Section are as follows: Chairman, J. M. Leathers; Chairman-Elect, Dr. G. E. Ham; Secretary, E. A. Mayerle; Treasurer, B. H. Miles; and Councilor, Dr. R. P. Langner. Dr. Max Blumer from Woods Hole was the speaker for a joint meeting of the Brazosport ACS Section and the Texas Dow Institute. Section speakers during the spring were Dr. W. W. Wendlandt from Texas Tech, Dr. Lewis Hatch from UT-Austin, and Dr. Harry Sisler from the University of Florida. Thirty-eight papers were presented at the Sixth Annual Texas Dow Institute Scientific Meeting in May.

The officers for the Dallas-Fort Worth ACS Section are as follows: Chairman, Dr. Russell Bowman; Chairman-Elect, Dr. William R. Foster; Secretary, Russell Walker; Treasurer, Dr. William R. Glaze; and Councilors, Drs. John Banewicz and Morton Prager.

Ph.D. programs in chemistry, physics, and biology will begin this fall at North Texas State University (now UNT). These three programs plus a doctorate in business administration to start in 1965 have been ap-

proved by the Texas Commission on Higher Education. In chemistry the Ph.D.s will be given in biochemistry, inorganic chemistry, organic chemistry, and physical chemistry. The state commission further said that North Texas is to be regarded as the institution whose role it will be to develop doctoral programs in mathematics, the sciences other than engineering and medicine, the fine arts, humanities, and social sciences, as the needs develop.

At Humble Oil & Refining Co. in Baytown, seminars were recently presented by Dr. M. J. S. Dewar of UT-Austin, Dr. Peter Debye of Cornell, Dr. F. G. Bordwell of Northwestern, Dr. A. W. Worthram of Texas A&M, and Dr. T. H. Schulman of Columbia. Dr. Richard B. Turner of Rice has been elected to the National Academy of Sciences. Dr. Turner becomes the eleventh member of the Academy from the state of Texas.

Dr. Arthur Fry has been named Chairman of the University of Arkansas chemistry department. Dr. Samuel Siegel is back on campus after spending a year at the Queen's University in Belfast, Northern Ireland. Dr. Paul Kuroda has returned after spending the summer months at the High Energy Accelerator Laboratory at the University of Tokyo.

Contributed by  
E. Thomas Strom

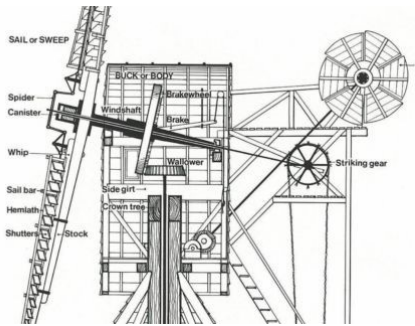


# Electricity from Wind Power: Technology and Economics by John E. Spessard, PhD



Wind-generated electricity is a growing industry with continuing growth expected. I am going to look at both the technology and the economics. I am only considering land-based wind farms. Off-shore wind farms have a different set of issues.

## Technology



A wind turbine capable of generating two megawatts will stand about 60 meters

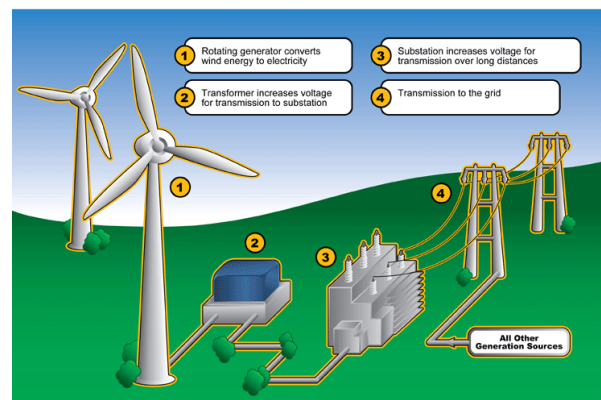
high. The blades will be about 15 meters long. The concrete base will occupy about 0.75 acres. The separation between turbines will be from 5 to 10 blade diameters (30 to 75 meters). Exelon Wind's leases require two to three acres per turbine. Positioning of a turbine is critical in that a difference of 30 meters can double the power output. Land will also have to be available for access roads and possibly energy storage facilities, buildings and backup generating capability to provide needed electricity when the wind does not blow.

The access roads are mandatory. Climbing up to a turbine will involve either a potentially dangerous climb (particularly in bad weather or at night) or using a crane. The crane will be mandatory for replacing a turbine or blade. Renting a crane and getting it

to and from the wind farm can result in significant down time and expense.

A wind farm allows the unused part of the land to be available for ranching and farming. The turbines don't seem to bother cows. In inhabited areas, some separation is required. The Ontario Ministry of the Environment requires a 550 meter separation from inhabited areas for five relatively quiet turbines. For 11 to 25 large turbines the required separation from inhabited areas can be up to 1,500 meters.

The wind is strongest at night. Unfortunately, this is when the demand for electricity is lowest and conventional fossil fuel generators already have available, unused capacity. Wind velocities during the day are both lower and more variable. The average potential



electricity generation is about 1/3 of the rated power. Thus three two-megawatt turbines on an average will provide two megawatts of electricity (sometimes more, sometimes less).



There are three levels of conventional electric power plants. The first are the newest, most efficient plants. The utility will make a point of having them available as much as is possible and during peak demand times such as a warm summer afternoon. Scheduled maintenance will be during low demand times such as spring and fall. Next are the older conventional power plants that are less efficient. They will operate when more electricity is needed than can be supplied by the newer plants. Third are the peaking power plants that provide electricity for short times at peak demand such as a few hours on a hot summer afternoon. It is unlikely that wind-generated electricity can replace main-line fossil-fuel-fired plants. This is because a utility is required to meet ANY foreseeable demand for electricity. This would be late afternoon on a hot, humid summer day. This is not the time when wind power is at its most dependable.

There is the tyranny of the Second Law. Maximum efficiency is achieved when the difference between the operating temperature and the discharge temperature is highest. This is the role of the main-line plants. But these plants require several hours to reach operating temperatures from a cold start. For example, an EPA study shows that it takes about six hours for a main-line plant to reach 60% operating levels. Peaking units can operate from a cold start in about ten minutes. But they are less efficient and require more fuel.



A reason is that for main-line units the fire-box is steel for strength with a ceramic or fire brick liner to withstand the higher temperatures. But the steel shell and the inner liners have different rates of thermal expansion or cooling. Thus, too quick a temperature change could cause separation of the liner from the shell. The peaking units have only a steel shell so fast heating is not an issue. However, the operating efficiency is lower, and more fuel is required to generate electricity. For example, a California Energy Commission report showed that the average energy needed to generate a kilowatt hour of electricity was 7855 Btu (British thermal units) for a main-line gas-powered generator and 10,705 Btu for a gas powered peak load plant. It is a 36% difference.

If the wind farm is generating electricity

that is required and is being depended on, only peaking units can meet the demand. It is also possible that additional transmission facilities may be needed to transport wind-generated electricity to the customers.

There are technical publications that are intended for people interested in a field. They are free. Their income comes from ads placed by firms wanting to sell to the industry. Having a PE license gets you on a lot of lists. I have been receiving one such publication, *Wind Systems*. I have found it very informative. *Wind Systems* is an industry voice.



An article in the May 2014 issue discussed the need for energy storage systems to avoid needing a plethora of fossil-fuel-fired peaking units. One of the more promising cures was lead-acid storage batteries. This is uneconomical.

There are discussions of even large wind turbines rated at six megawatts. The technology and maintenance may be very different. The turbines will be farther off the ground and the blades will be longer. Longer blades will exert more torque on the turbines. This and the added height may increase turbine maintenance costs. The greater height may require increased use of more expensive cranes with increased labor costs. The larger turbines may be in the realm of unproven technology.

### **Economics**

The capital cost of a wind-powered facility is greater than that of a natural-gas-fired or coal-fired power plant. In millions of dollars per kilowatt in 2010 dollars is wind, 1.57, conventional coal, 1.92 and natural gas, 0.88. However, the wind turbine averages about 35% of rated capacity and the fossil-fuel-fired plants average about 85% of rated capacity. But wind power has no fuel costs. Coal-fired plants have the disadvantage of dealing with emissions of SO<sub>2</sub>, nitrogen oxides, particulate matter and CO<sub>2</sub>. Gas-fired plants must deal with emissions of nitrogen oxides and CO<sub>2</sub>. Wind power would be a clear winner if it could reliably provide power at peak demand times with 85% reliability. However, wind power is most efficient at night when the demand for electricity is at its lowest.

If there were a satisfactory method of storing the wind farms' output where it could be released at high demand times, wind and solar power would become much more feasible. At the present time, wind-generated electricity is

put on the grid even if now unneeded fossil-fuel-generated electricity has to be dumped. Or the wind-generated electricity can be dumped while still collecting the 2.2 cents per kilowatt federal subsidy. A possible additional cost is a need to build additional transmission lines from a wind farm to customers.

Sizing existing models of natural-gas-fired peaking plants to a wind farm may provide issues. The smallest peaking plant I saw mentioned was rated at 40 megawatts at a cost of \$1.227 million per megawatt. A 20 turbine wind farm rated at two megawatts per turbine would have a listed output of 40 megawatts. A 35% actual output or 14 megawatts would be more realistic. In my travels through West Texas and Eastern Colorado, I have seen no wind farm with more than 20 turbines with ten turbines being more common. Using the 0.6 rule, a ten megawatt gas peaking turbine would cost about \$2.6 million a megawatt.

Costs associated with a gas-fired peaking plant include the capital cost, O&M on the plant, the cost of natural gas, the cost of getting natural gas to the site and at least one on-site employee. Natural gas is flammable and an on-site employee would be needed to start and shut down the plant at least for safety concerns.

I found some cost figures for an oil-fired peaking plant. Since the oil cost was presented at \$42 a barrel, I did not pursue this data any further. Natural gas per BTU is now cheaper than any form of oil.

Utilities routinely buy and sell power from each other. Buying power for a short time may be more economic than starting up an additional plant. Rather than having on-site gas-fired peaking units, a wind farm could buy electricity from a fossil-fuel-fired unit.

With peak performance at night when electricity demand is low, the wind farm would be a net buyer of electricity from other utilities. This might require constructing additional power transmission lines and would not reduce the need for conventional power plants.

This is why *Wind Systems* published the article on electricity storage. If such technology were available at a reasonable cost, this would do much for the feasibility of wind and solar electricity.

Operations and maintenance (O&M) cost of wind turbines are initially covered by manufacturer's warranties. The warranty period is negotiable. After the warranty period, O&M can be done, either by the turbine owner or firms specializing in turbine O&M. I have seen two articles in *Wind Systems* that express concern about increasing O&M costs for out of warranty turbines. The article also states that O&M costs increase as the units age. (This would be expected.)

I have the greatest respect for German and Danish competence in the areas of science, technology and engineering. Both nations are heavily committed to renewable energy and they have the highest electricity rates in the developed world. In 2011, the average cost of electricity in cents per kilowatt hour was Denmark 41, Germany 35 and the United States 12. Since then Germany has increased the renewable energy surcharge per kilowatt hour from 5.3 cents to between 6.2 and 6.5 cents. This is the real world.

Also from the real world, T. Boone Pickens invested heavily in wind power and he was an advocate. Since then, Mr. Pickens has

bailed out for the reason that wind energy has no prospect of becoming economic. If you wish to disagree with Mr. Pickens's business judgment, be my guest.



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# CLIMATE CHANGE: ANOTHER VIEWPOINT

By David Birney, PhD

*In the April issue of the Southwest Retort, Dr. John Spessard expressed his views on the current phenomenon of climate change. Dr. David Birney has submitted another viewpoint on the topic:*

Climate change just might be the defining issue of our times. Sea level rise alone could displace millions of people – think Miami, New York, London or Bangladesh. Droughts and the ensuing famines could disrupt entire countries – think Nigeria or Syria. Any attempt to address such global issues is far beyond the scope of the Southwest Retort, but it is appropriate to consider the science of greenhouse gases here.

As chemists, what do we know about carbon dioxide as a greenhouse gas? In 1859, John Tyndall measured the transmittance of infrared (IR) radiation through gases, including dry air, water vapor, and carbon dioxide, although he did not use quite that vocabulary. From a quantum physics perspective, an infrared photon can be absorbed by a molecule if it excites a vibration that changes the dipole moment of the molecule. So while the major atmospheric gases, N<sub>2</sub>, O<sub>2</sub> and Ar do not absorb IR, other atmospheric molecules including water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>) do. In 1896 Arrhenius calculated what the effect of increasing carbon dioxide would be on the earth's temperature and current climate models are in qualitative agreement with Arrhenius' results.

So how does a greenhouse gas work? Be-

ing transparent in the visible and ultraviolet, N<sub>2</sub>, O<sub>2</sub>, Ar, H<sub>2</sub>O and CO<sub>2</sub> allow light from the sun to pass through the atmosphere and to reach the earth's surface, where photons can be absorbed and heat the earth. The earth can only cool by radiating heat (IR) into space. But greenhouse gases absorb some of that IR and thereby keep the earth warmer. The reduction in IR emitted at the wavelengths of water and carbon dioxide has been observed by satellite.

But does the greenhouse effect pass the "reasonableness test"? Does it fit with daily experiences? When the sun shines, it gets hot and the longer it shines (summer time) the hotter it gets. But in a dry climate (e.g., Lubbock, Texas, where I live), as soon as the sun sets, it cools off quickly and it can be lovely to sit outside in the evening. In a more humid place, it doesn't cool off nearly as much or as quickly at night. Therefore, the greenhouse effect of water vapor fits our everyday experience, affirming the effect of carbon dioxide as well.

What about carbon dioxide? CO<sub>2</sub> is not removed from the atmosphere as readily as water, but instead tends to accumulate. This means it is more evenly distributed globally than water vapor, and so local variations are not observed. But the same greenhouse effect is operative, reducing cooling of the earth.

Are carbon dioxide levels increasing? Yes,

beginning in 1958, atmospheric carbon dioxide has been carefully measured at Mauna Loa, Hawaii (and elsewhere), and CO<sub>2</sub> levels have increased from around 300 to 400 ppm. This is a dramatic increase in the blink of a geological eye.

What caused this measured increase in carbon dioxide? After all, volcanoes, rotting plants, even breathing produce CO<sub>2</sub> while plants use it for photosynthesis and the oceans absorb it. These natural processes would still be in balance, were it not for burning fossil fuels, which loads CO<sub>2</sub> into the atmosphere. Indeed atmospheric carbon isotopic signatures match fossil fuels and not plant material from more recent photosynthesis.

To recap so far: carbon dioxide is undoubtedly a greenhouse gas. Daily experiences with humidity, along with more than a century of science, agree. Burning fossil fuels puts more carbon dioxide into the atmosphere than plants and the ocean can absorb. Measurements show that the atmospheric levels of carbon dioxide are increasing. And therefore the temperature of the earth is expected to continue to increase.

As with any noisy trend, there are ups and downs, but appropriate statistical analysis of the measured global atmospheric and ocean temperatures show that global air temperatures have been increasing since the start of the industrial revolution and that this trend is continuing. The 10 hottest years on record are all from 1998 and later. One may sometimes read “the temperature has not risen since 1998”. Even if 1998 was the hottest year on record (it’s not; 2010 was the hottest) this is not statistical-

ly valid, as this year was much warmer than the trend, because there happened to be an exceptionally strong El Nino in 1998. If a strong El Nino develops in 2014, then this may be an exceptionally and record-breaking hot year as well. The spring of 2014 was globally the hottest on record and May 2014 was as well.

Is all of this an intellectual exercise in physics? Not at all! As the earth warms, ice will melt and water will expand. The sea level (from melting land ice and expansion of water) will rise and inundate major cities like Miami and New York, as well as much of Bangladesh. Ice is melting in the Arctic, in Greenland, in glaciers around the world, and in Antarctica. Indeed melting of land ice in Antarctica is more extensive than the small increases in sea ice extending around Antarctica.

Warmer temperatures also mean more evaporation and more rain. Unfortunately, that rain may not fall where and when it is needed. The predictions are that some parts of the world will see more drought while others see more flooding. Droughts mean famine and famine can lead to civil unrest.

Is it not most prudent to accept the abundant scientific evidence that burning fossil fuels (natural gas, petroleum and especially coal) increases the concentration of carbon dioxide, a well-understood greenhouse gas? Should not our society have a sober and level-headed discussion of how to address the immense challenges that climate change presents?

***Disclaimer: my views are my own and do not represent Texas Tech University, the ACS or any other institution. But they are in accord with 97% of climate scientists.***



# *...And Another Thing...*

**by Denise L. Merkle, PhD**

## **Entropy and Me**

2014 is shaping up to be a wicked year. Wicked. The positives in 2014 are very often offset by pessimism. Recent reports of promising, if unapproved, treatments for diseases such as Ebola thrill the scientists (who doesn't want to bask in the reflected glory of effective RNA therapies?), and leave the humans wary if not terrified. Positive science. Wicked infection. And it appears that for every peaceful resolution to a conflict, another crisis fomented by wild-eyed militants arises. Positive diplomacy. Wicked ideology. Maybe an unprecedented pay-it-forward campaign springs up at a coffee shop—and ends when someone doesn't participate because “I'm from out of town.” Positive caffeination. Wicked something. Wicked? Hmmm. Well, maybe not wicked... maybe just unaware of the effect on the cosmos. Anyway. All this focus on interrelatedness has been the aftermath of a fairly recent sudden bereavement, the effects of which have entered into nearly every thought and every conversation I've had since February.

It is not unusual to lose a parent; in fact, one can argue that the passing of the older genetic distributors is the natural scheme of things - but that doesn't make the situation any easier, or make the mourners any less inconsolable. While thinking about the (alleged) healing processes that accompany the passing of time, I wondered if the old-fashioned custom of mourning might be

helpful. The idea that an entire year should be devoted to spreading balm on one's own raw pain is quite comforting: Leave the demands of the world to those whose lives have not been upended by the frailties of physiology. Use the solitude to contemplate the future—and life as it now is. An attempt to wallow in this traditionally black-swathed ritual led to disconcerting results.

The problem with this withdrawal into the rarified acknowledgement of emotional fragility is that the IRS does not actually care why one's attention was diverted from quarterly filings, nor does the water department's website have a button for “too distracted to send payment.” Mourning is an amazingly effective entropy generator (not that a generator is actually required). Perhaps entropy enhancer is a better term. 2014 is shaping up to be a wicked year, with greatly enhanced entropy. What is the point of all this maudlin meandering, you may ask. The point is that, physical principles are physical principles. We all knew that already, but we don't often have a chance to prove it in our own lives. Everything tends to disorder - and the disorder doesn't ease up when the system inverts. Entropy exists- but can it attack? The answer to this questions is left as an exercise for the reader.

***RIP Eileen May Merkle August 22, 1937-February 23, 2014. The world is a better place because you were in it.***

# FAREWELL TO THE QUEEN OF CHEMISTRY!

by E. Thomas Strom

Editor Emeritus, The Southwest **RETORT**

## MY FINAL INTERVIEW WITH ACS EXECUTIVE DIRECTOR MADELEINE JACOBS

You readers are probably thinking that the first line of my title is over the top, but in my first interview with Madeleine Jacobs, I used the title Queen of Chemistry. At that time, Madeleine was Editor-in-Chief of C&EN, but she later became the first woman CEO of ACS. Perhaps Empress of Chemistry would be a better title now, but I will stick with Queen of Chemistry.

My first interview with Madeleine came about when she was visiting TCU as the Ruth Evelyn Sanders lecturer. That was in September of 2001, and my interview appeared in the October 2001, issue of *The Southwest Retort*, pp. 5-7. My second interview with Madeleine was in the fall of 2004, shortly after she had become ACS CEO in January, 2004. This interview appeared in the November and December, 2004, issues of *The Southwest Retort* (Nov. pp. 5-7, 9; Dec. pp. 5-7, 10-15). In both interviews, I reviewed Madeleine's early career and in the second interview she discussed the strengths and weaknesses of ACS. I won't repeat that material here.



My last sentence might pose a problem to you. If you wanted to read that material, how would you get it? The same way I did, which was NOT by thumbing through my many issues of *The Retort*. Instead I linked to

(<http://digital.library.unt.edu/explore/collections/DFWCS/browse/>) and I

typed in the key words Madeleine Jacobs. The needed issues came right up. Thanks are due to Jim Marshall and Hannah Tarver of UNT for getting all the issues of *The Southwest Retort* and its predecessor *The Activator* available online at UNT.

I'm sure you readers are aware that Madeleine will retire as CEO at the end of this year. I thought one final interview would 'book end'

*The Retort's* treatment of her ACS career. Madeleine graciously took time from her busy schedule for our interview on Aug. 13 at the ACS national meeting in San Francisco.

Madeleine writes poetry on occasion, and it is very good poetry. Right now she has no time to write poetry, but in retirement she hopes to write more poetry and possibly publish some of it. In one poem she mentioned that her mother named her after a movie star. I guessed

it was the British actress Madeleine Carroll, and Madeleine confirmed that my guess was right. (For you film buffs, Madeleine Carroll starred opposite Robert Donat in Hitchcock's classic *The Thirty-Nine Steps* and also played opposite Ronald Colman in the first sound version of *The Prisoner of Zenda*.) In 1991, Madeleine was visiting a friend in Chile and met a friend of this friend who asked her about the origin of her name. She told him he wouldn't know this actress (after all, he was Chilean), but that she was named after Madeleine Carroll. The man lit up and told Madeleine that Madeleine Carroll was one of his best friends. He had met Madeleine Carroll in Hollywood, and they also had houses next to each other in Spain, where Madeleine Carroll had retired. He went on to say that Madeleine Carroll was truly a kind, lovely person.

I started out asking her why she was retiring right now. She re-

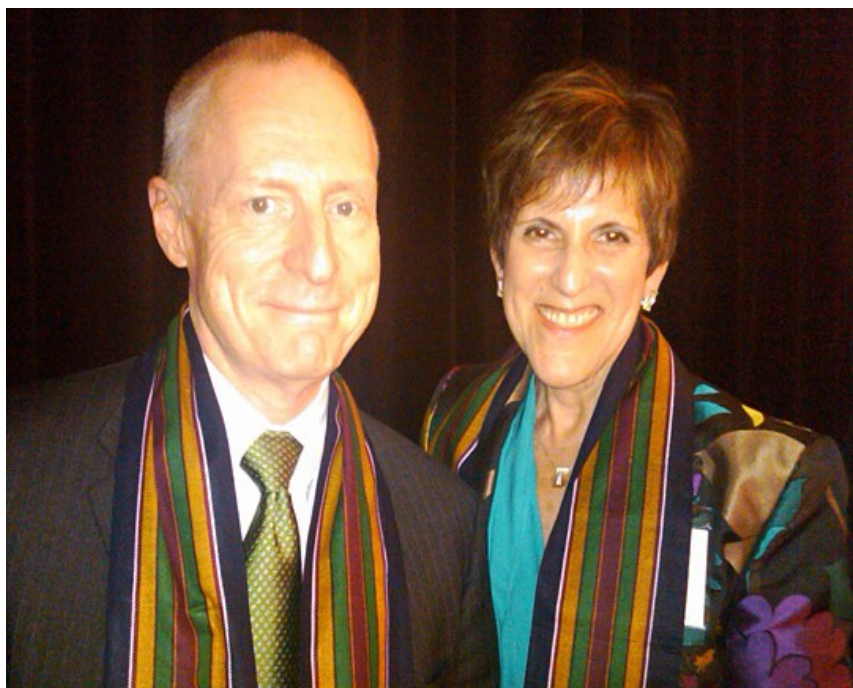
sponded that she had had forty-five years of a highly successful career and that she had accomplished all the things that were on her original list as ACS CEO, although it took almost eleven years to do that. This is a very good time to let a new person come in to take ACS to the next level. She believes she has

left a very strong foundation. Madeleine does have some other things she wants to do, so there is a very busy future ahead. She also felt it is a good thing to leave when you are at the top of your game. The Board of Directors is happy with what she has done, and the ACS Council seems to appreciate her. (Note, at the morning Council meeting, Madeleine received not one but two standing ovations.) However, she is going to be sixty-eight in November; she has worked non-stop for forty-five years; and she has a husband who is 90. She would like to be able to have breakfast with him eve-

ry morning. Retirement will also give her the opportunity to do some of the volunteer activities she has always wanted to do.

I followed up by asking what she considered were some of her most significant accomplishments. She stated that providing accurate scientific information is the number one goal, and she has worked to ensure

that the governing boards for the various ACS publications are top notch. ACS publications provide 92% of ACS income and ACS journals are considered by the chemistry enterprise the premiere chemistry journals with SciFinder the gold standard for information retrieval. Also, the publications involve 2/3 of ACS em-



**William F. Carroll Jr. (left), master of ceremonies for NOBCChE's science bowl final this year and a past-president of ACS, poses with Madeleine Jacobs, who attended and judged the science fair**



ployees. She spent a lot of her time on ACS communications, and she is proud of the results.

She is also pleased that we now have a much better set of career resources for our members. Over the past eleven and a half years chemistry has undergone an upheaval in industrial employment, so ACS has had to rethink everything they have been doing. We are still in a state of evolution as to what we need to provide for our members. Madeleine is also proud that

Kitty Hach in 2009 transferred the assets of the Hach Scientific Foundation, which funds research to improve high school chemistry education, to ACS. At that time the Hach Foundation assets were worth \$35 million. Now they are worth \$45 million. The Hach Foundation will

be complementary to the American Association of Chemistry Teachers, which ACS is setting up. Madeleine is also pleased with improvements to the ACS website, although that is always a work in progress.

In 2004, she also undertook the process of surveying and evaluating the portfolio of ACS programs (Membership & Scientific Ad-

vancement, Education, and the Office of Public Affairs). That task took a long time with the help of a lot of people, but late last year the ACS Boards of Directors adopted a Society Program Portfolio Management (SPPM) process. The process is a first in ACS history and will provide ACS with a way of strategically adding new programs as well as reviewing, updating, and sun-setting current programs.

I asked her if there were things she didn't get done that she

wished she had. She said really not, because a foundation has been built to handle future difficulties. Of course, there will be a whole new set of big challenges ahead. In one sense the job is never done, because the external environment is always changing. The next director will have a new set of



**Madeleine Jacobs with students from the Department of Chemistry and Biochemistry, University of Massachusetts Dartmouth**

challenges, but Madeleine feels very happy about what she has done; and this reinforces her belief that now is a good time to retire. She does not feel that she left some important task undone.

Before this interview, I had asked several people what questions I should ask Madeleine. One interesting suggestion was that I ask,



“Who would you like to take a baseball bat to?” She said seriously that there was no one she wanted to clobber. With her years at C&EN and as CEO, she had worked with 25 different presidents. There was never an ACS member that she couldn’t get along with and have constructive conversations with. She said that members always felt that she would hear them out, even if she couldn’t fix their problem. ACS to her was like a family, and you love them even if you occasionally disagree with them.

Last year ACS membership was 161,000. I asked her if there were prospects for further growth or if ACS has reached a steady state. She responded that there was room for further growth, both domestically and internationally, but she felt the larger growth would come internationally. We have 25,000 international members, and they want to be part of us because ACS represents quality. Even in countries with strong chemical societies, we will continue to see growth.

At this point I pushed back, citing a past interview I had had with Norman Hackerman, former president of UT-Austin and Rice. Norman felt that there was absolutely no need to increase the number of chemists, save to replace those who died or retired. Norman’s view, an unpopular one with his fellow chemistry faculty, was that the astounding growth and improvement in instrumentation meant that the present day chemist was five or ten times more productive than their predecessors. Madeleine respectfully disagreed. She did say that there was currently a mismatch between the jobs people were trained for and the jobs avail-

able. For example, she said we were training too many synthetic organic chemists at the graduate level who are going to find it difficult to get jobs in the pharmaceutical industry. However, if you look at the global challenges facing this planet--- providing clean water, providing enough food, providing new materials, providing sustainable energy, combating diseases, combating climate change, protecting the environment



With Mary Good and Judith Benham

there is no way we are going to be able to solve these problems without the contributions of chemically-trained scientists. She thinks there may be a mismatch between where chemists are needed and what we are producing, but this will self-correct. New challenges come up all the time. Chemists are very versatile, and they work at the interfaces of all these other fields. It is only if you define a chemist very narrowly that you could say we have enough of them. She pointed out that ACS President Tom Barton said in his talk to the ACS Council today that there is still a bright future for chemists and chemistry, because of all the important problems that chemists can help solve.

I asked Madeleine what she hoped to do in

retirement. She said first of all she can't wait to be an active ACS member. She is an ACS member, but she has been unable to serve on committees. She is looking forward to coming to ACS meetings and attending technical sessions instead of going to committee meetings. She particularly wants to work on celebrating the 20th anniversary of the ACS Scholars Program. Second, she is on the Board of Trustees for her alma mater, George Washington University. She has been appointed chair of the Academic Affairs Committee. This university is on the move. A new 500,000 square foot science and engineering hall will open in a few months. Also George Washington University Museum has just merged with the Textile Museum, a well-known Washington-based museum. She is also co-chair of the \$100 million portion of a \$1 billion capital campaign for George Washington University. Finally, she also hopes to be active in the Hartswell Foundation in Cambodia, started by a good friend of hers. The work of this foundation involves providing secure dormitories for young women, where they can stay while attending college on scholarships. She has been an active donor and also hopes to go to Cambodia sometime in the future. To sum up, Madeleine doesn't want a relaxing retirement, where you just sit around and read books. She wants to be flexible but actively engaged.

Madeleine has been married 42 years to the artist Joe Jacobs. She has a stepson and two grandsons. She works out with a trainer and would like to lose the 20 lbs she has gained with the ACS job. She

loves to cook, and when she is in town, she cooks every night for her husband. During the summer swimming is an important pastime. During the first 25 years of her marriage, she and her husband took many foreign vacations, so she feels no need for further travel. She did note that they had taken a road trip this summer, which they enjoyed very much. They have tickets to the Washington Performing Arts Series and to the Baltimore Symphony Orchestra. On Sept. 29 Madeleine is looking forward to seeing Cher in concert in Washington.

Madeleine Jacobs has served ACS these many years with grace and competence. She certainly deserves time during retirement to enjoy herself, although it is clear she will have an active retirement. As the first female executive director of ACS, she set a high standard for any successor, whether male or female. Personally, I have been grateful for her willingness through the years to give me those interviews designed to inform *Retort* readers about the important issues in ACS. Let's hope that the ACS Board of Directors chooses another winner like Madeleine as our new CEO.



## 2014 Doherty Award Winner

### Angela Wilson

#### University of North Texas

Dr. Angela Wilson of the University of North Texas is the 2014 Doherty Award Winner. She earned her B.S. in Chemistry at Eastern Washington University, in Cheney, WA. After completing her Ph.D. at the University of Minnesota, she spent a little over two years at Pacific Northwest National Laboratory as both a postdoctoral researcher and a visiting scientist. Following a few more years in various research capacities, Dr. Wilson began her professorship at the University of North Texas in 2000, eventually rising to the rank of Regents Professor in 2011. Dr. Wilson was the first UNT faculty member to be awarded the prestigious NSF CAREER Award in 2003. Additionally, she received a 2003



Wiley International Journal of Quantum Chemistry Young Investigator Award. In 2010, Dr. Wilson was named a Fellow of the American Chemical Society. Further, she was also recognized as a Fellow of the AAAS in 2012. In 2015, Dr. Wilson will be honored with the Francis P. Garvan-John M. Olin Medal awarded by the American Chemical Society for her service to chemistry as a female chemist. Research in the Wilson lab focuses on the understanding and application of quantum mechanical methodologies to explore interesting challenges within environmental chemistry, transition-metal chemistry, and material science.

At the DFW Section September meeting on September 9, Dr. Wilson presented a lecture entitled *Energetic and Spectroscopic Properties Across the Periodic Table*.

## DFW Section October Meeting

October 27th, 2014, 6-9pm

### Werner Schulz Award Winner

### Mrs. Karen Compton, Plano East HS

Plano East Senior High School, 3000 Los Rios Blvd, Plano TX 75074. A BBQ buffet will be served (Smoked Turkey, Pulled Pork, Smoked Brisket, Mashed Potatoes, Coleslaw, Baked Beans, Sourdough Rolls, and Apple Cobbler)

**Watch your email for meeting registration and details**

# *CALL FOR NOMINATIONS*

## *THE GUSTAVUS JOHN ESSELEN AWARD*

**TO:** Section and Division Chairs, Editors of Newsletters, Research Directors, and Chairs of Academic Departments

**FROM:** Mukund Chorghade, 2015 Chair of the Esselen Award Committee

**SUBJECT:** Request for Nominations for the 2015 Esselen Award for Chemistry in the Public Interest

The Northeastern Section of the American Chemical Society is pleased to invite nominations of worthy candidates for the Gustavus John Esselen Award for Chemistry in the Public Interest. This award recognizes a chemist for outstanding achievement in scientific and technical work that contributes to the public well-being. The award consists of a \$5000 prize and a medal of recognition. The presentation takes place at an award ceremony in April at Harvard University, followed by a formal address by the awardee.

The award was established in 1987 to honor the memory of Gustavus John Esselen, a distinguished member of the Northeastern Section. The first awardees were F. Sherwood Rowland and Mario J. Molina, who subsequently received the Nobel Prize. Several other recipients of the Esselen Award have also been Nobel awardees. Any field of chemistry or affiliation is appropriate as long as the scientific work has been an important contribution to the public well-being and its significant value to society has become apparent within the last five years.

The announcement details the nature of the award and the criteria and procedure for nominations. Further information is available at [www.nesacs.org/awards\\_esselen.html](http://www.nesacs.org/awards_esselen.html). This letter is to seek nominations of colleagues whose work meets the criteria and purpose of the award. The deadline for nominations is October 15, 2014.



**NORTHEASTERN SECTION**  
**AMERICAN CHEMICAL SOCIETY, INC.**  
**THE GUSTAVUS JOHN ESSELEN AWARD COMMITTEE**  
**19 MILL ROAD HARVARD, MA 01451**  
**PHONE (978) 456-8622**  
**FAX (978)456-8949**  
**EMAIL [piper281@verizon.net](mailto:piper281@verizon.net)**





**Sign Up Now for October 4-5, 2014**

**REGISTRATION, SPEAKER LIST, AND SCHEDULE**

**[EARTHWINDFIRESUMMIT.ORG](http://EARTHWINDFIRESUMMIT.ORG)**

**Speakers on Traditional, Renewable, & Emerging Fuel Sources**

Energy is in the news everywhere today and these sources are having impacts across the state and in our region. Although the conference features professionals and academics that work in the energy arena, the plenaries and breakout sessions promise to address energy issues in a clear and nontechnical way.

The Dallas Sierra Club and other nonprofit organizations are hosting the first “Earth, Wind & Fire Energy Summit,” an exciting educational event, at the Addison Conference Centre the weekend of October 4-5, 2014.

This conference is unique in that it not only covers many traditional sources of energy including natural gas, coal, oil, and nuclear, but also discusses renewables and emerging forms of energy such as waste-to-energy generation.

The conference also features a two-part Communications workshop with print/TV/radio journalists, including Jeff Crilley on how to get “Free Media with No Money.” Journalists Randy Lee Loftis, Shelley Kofler, and Paul Adrian will also give their perspectives of media today in a digital world in a second media workshop discussion.

Space is limited for this event. Early registration is \$55 through Sept. 2 and \$75 thereafter. For more information or to learn about exhibitor opportunities, contact Rita Beving at [rita.beving@gmail.com](mailto:rita.beving@gmail.com).

Co-sponsors and exhibitors to date include Public Citizen, Earthworks, Texas Campaign for the Environment Fund, League of Women Voters of Dallas, GreenSource DFW, Seed Coalition, Texas League of Conservation Voters, and Clean Water Fund.

# NATIONAL CHEMISTRY WEEK 2014

It is time to start planning for National Chemistry Week 2014! For the past 3 years, DFW Chemistry organizations have come together to serve the DFW community through a collaborative effort at the Fort Worth Museum of Science and History (FWMSH). Last year we reached over 5,750 museum visitors and had over 130 volunteers from universities. We were supported by the addition of three amazing high-school groups! We would love to continue on with this tradition but need YOU!

The theme set by the ACS is **Sweet Side of Chemistry**. It is important to note that the museum is hosting the **Myth Busters** exhibit during NCW as well. I have met with Cathy, Anne and Rebecca at the FWMSH, and we think it would be appropriate to incorporate both themes into our work! How fun, right!? We are excited to get started for this year's event and I hope that you all can plan on participating again. [www.SignUpGenius.com/go/409044BA5A92CA75-national](http://www.SignUpGenius.com/go/409044BA5A92CA75-national)

## Important Dates:

**September 6**, 9:30 a.m., Fort Worth Museum of Science and History – **Organization and Planning Meeting**. All groups planning to participate need to have 1+ representative present, so that we can be as organized and cohesive as possible. If you can't make it, please communicate with me about your plans. We'd like for as many people to participate as possible, so please spread the



word with your colleagues.

**October 21-25:** National Chemistry Week at the Fort Worth Museum of Science and History

## National Chemistry Week 2014:

October 21-25 at the Fort Worth Museum of Science and History- Tuesday, October 21, 10 am-2 pm

Tuesday, October 21, 6 pm-8 pm

*NEW\* Museum Night. The museum is hosting two local schools (~1200 visitors expected) for a private night at the museum featuring our volunteers.*

Wednesday, October 22, 10 am-2 pm

Thursday, October 23, 1:30-4 pm: Home School Afternoon

Friday, October 24, 10 am-2pm

Saturday, October 25, 10 am-4 pm

## ACS Site for NCW 2014:

<http://www.acs.org/content/acs/en/education/outreach/new.html>

We hope to see you there!

Kayla N. Green, Ph.D.

Faculty Sponsor, Student Affiliates of the ACS

Assistant Professor, Chemistry

TCU, Ft. Worth, TX



Dr. Kayla Green, TCU

# SOUTHWEST REGIONAL MEETING 2014



Fort Worth, TX | November 19-22, 2014

## CONTACTS

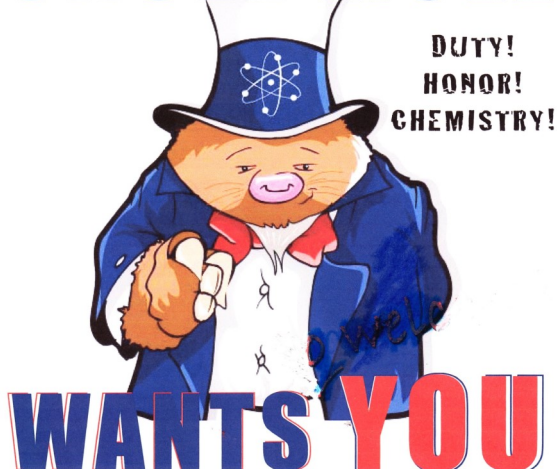
Kirby Drake, General Chair: [kirby.drake@kk-llp.com](mailto:kirby.drake@kk-llp.com)  
Danny Dunn, Program Chair: [dannyldunn@sbcglobal.net](mailto:dannyldunn@sbcglobal.net)  
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Denise Merkle, Exhibits Chair: [dmerkle@sciconsult.com](mailto:dmerkle@sciconsult.com)  
General SWRM mailbox: [swrm@acsdfw.org](mailto:swrm@acsdfw.org)



Information and registration at

**SWRM2014.org**

## UNCLE MOLE



To volunteer for the 2014  
Southwest Regional ACS  
Meeting! SWRM 2014  
will be held at the Fort  
Worth Renaissance  
Worthington Hotel,  
November 19-22, 2014.



# NOW SOLICITING for SWRM 2014 Sustainability Symposium Presentations for Climate Science, Water Purification, and General Sessions

The DFW/ACS Section has received a mini-grant from the National ACS to support a Sustainability Symposium for the 2014 Southwest Regional Meeting (SWRM), November 19-22. Submission of abstracts is sought for ORAL PRESENTATIONS, for each of three sub-sessions: *Climate Science With and Beyond the ACS Toolkit*, organized by Bob Landolt ([rlandolt@txwes.edu](mailto:rlandolt@txwes.edu)); *New Processes for Water Purification*, organized by Connie Hendrickson ([ch@arkonconsultants.com](mailto:ch@arkonconsultants.com)); and “General Topics in Chemical Sustainability,” organized by Landolt and Hendrickson. The specific time/date for the symposium components will be announced as soon as possible.

Supported by Climate Science Challenge Grants, the DFW and other ACS Local Sections have conducted a variety of activities in 2013-14 designed to provide insights to Climate Change issues through use of an online *Toolkit* (<http://www.acs.org/content/acs/en/climatescience/about.html>). Abstracts are sought describing use of the toolkit and other approaches to understanding climate

issues, with emphasis on resources readily available and suitable for chemists and other scientists as well as a more general public.

Perhaps the most crucial short and long term Sustainability issue relates to availability of suitable water resources, both for communities and agriculture. Abstracts are sought focusing on effective procedures to provide Recycling/Reuse of quantities of water of sufficient purity for a broad range of applications as well as improving the efficiency of use of aquatic resources.

Abstracts suitable for a General Session on sustainability topics of concern and interest

to chemists are also solicited. At least one presentation employing a panel discussion is anticipated, and interest in participating in such a discussion may be explored with session organizers. The procedure for abstract submission to Sustainability

Sessions may be found under the *Program* link at [www.swrm2014.org](http://www.swrm2014.org).





## Nature inspires a greener way to make colorful plastics

### Plasmonic Metasurfaces for Coloration of Plastic Consumer Products

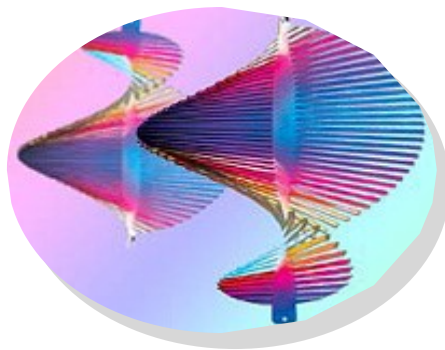
#### *Nano Letters*

Long before humans figured out how to create colors, nature had already perfected the process — think stunning, bright butterfly wings of many different hues, for example. Now scientists are tapping into those secrets to develop a more environmentally friendly way to make colored plastics. Their paper on using structure — or the shapes and architectures of materials — rather than dyes, to produce color appears in the ACS journal *Nano Letters*.

N. Asger Mortensen, Anders Kristensen and colleagues point out that currently, plastic manufacturers add pigments to their products. That gives them the range of colors customers have come to expect in everything from toys to tools. But these additional ingredients add to the growing waste stream of plastics manufacturing and make it difficult to recycle products. To come up with a more eco-friendly alternative, Mortensen's team turned to highly advanced materials that can be made to appear in different colors — purely by designing their surface structures at the nanoscopic level.

They layered materials, including ultrathin, nano-sized aluminum disks, in a way that manipulates light and creates a new kind of colored surface. To protect it from damage, the scientists topped it off with a scratch-resistant film. Using this method, they created a wide spectrum of colors that could be added to plastics.

The authors acknowledge funding from the Danish National Advanced Technology Foundation, the Danish Agency for Science, Technology and Innovation and the European Commission.



## DFW Section Notes



Dear Colleagues,  
I hope that this summer has been filled with wonderful activities and restful times! I look forward to our upcoming year and activities!

The August social at the Rosemeade Rainforest Party Deck in Carrollton was a great time to network and socialize. For this event, chips and soft-drinks were graciously donated by PepsiCo.

The September local meeting honored our Doherty Award winner, Dr. Angela Wilson. The meeting was held at the Oakmont Country Club. Following a social hour, we enjoyed an Italian buffet of beef lasagna and chicken alfredo. After dinner, Dr. Wilson gave a talk entitled *Energetic and Spectroscopic Properties Across the Periodic Table*.

Our October meeting will be held this year at Plano East Senior High School on October 27 from 6 – 9 pm. At this meeting, we will honor Mrs. Karen Compton with the Werner Schulz Award. Our dinner will include a BBQ buffet with a cobbler dessert. Please watch your emails for the RSVP link that will be sent out in the coming weeks.

Planning is underway for a November meeting in Fort Worth during SWRM. Although all details have not been finalized just yet, we will enjoy a food science lecture from Principal Scientist, Siva Kaliappan of PepsiCo.

I am looking forward to serving our community this year with great activities! As always, feel free to contact me with any questions or concerns.

All the best,

Shana Santos

DFW Section Chair-Elect 2014

### Summary/Updates from the Fall 2014 ACS National Meeting

Mary Anderson, Councilor

Greetings ACS DFW Section Friends!

Below are a few short notes from Division IV meeting and Councilors meetings at the ACS National meeting held in San Francisco.

There were a total of 14,578 in attendance!

Advanced registration fees will go up from \$380 to \$390, but we are about average costs of other Societies.

Total ACS members are 158,357 (down 1%) from last year. There is an ongoing

program announced by MAC (Membership Committee) that ends Dec 31, 2014, the Presidents Challenge, to increase membership in Divisions and Local Sections (ask me if you would like details).

The CEO search to replace retiring Madeline Jacobs is underway by Korn-Ferry; they hope to have the position filled early next year.

I attended the ChemLuminary Awards that honor efforts of volunteer members in Local Sections, Divisions, Committees and Regional meeting efforts. DFW was nominated for but did not win (this year) "Best Student Member National Chemistry Week Event." The many wonderful activities by ACS volunteers was amazing!

The Women's Chemistry Committee urges members to nominate women for awards.

Community activities noted the Perot Museum activity at the Spring National Meeting in Dallas.

The Senior Committee awarded 22 mini-grants (\$300) to encourage senior involvement in ACS; this is likely to be an ongoing opportunity.

Young Chemist Committee has another out of the box Webinar on October 7 entitled: "Speaking Simply: Communicating Your Science."

National encourages ACS members to sponsor memberships for teachers in

their newest venture: American Association of Chemistry Teachers (AACT); it is only \$50 ([www.teachchemistry.org](http://www.teachchemistry.org)). There are many benefits to membership, including lesson plans, etc. This new group has grown out of the need to better serve our teachers.

Next meeting is in Denver: March 22-26, 2015!



PHOTOS from SF Meeting August 2014



## From the ACS Press Room

### Toward a home test for detecting potentially dangerous levels of caffeine

#### Validation of Caffeine Dehydrogenase from *Pseudomonas* sp. Strain CBB1 as a Suitable Enzyme for a Rapid Caffeine Detection and Potential Diagnostic Test

*Journal of Agricultural and Food Chemistry*

The shocking news of an Ohio teen who died of a caffeine overdose in May highlighted the potential dangers of the normally well-tolerated and mass-consumed substance. To help prevent serious health

problems that can arise from consuming too much caffeine, scientists are reporting progress toward a rapid, at-home test to detect even low levels of the stimulant in most beverages

and even breast milk. Their report appears in ACS' *Journal of Agricultural and Food Chemistry*.

Mani Subramanian and colleagues note that caffeine's popularity as a "pick-me-up" has led to it being added to more than 570 beverages and 150 food products, including gums and jelly beans. It also comes in a pure powder form that consumers can use themselves to spike drinks and food. In small amounts, most people can handle caffeine without a problem. But excessive doses can lead to serious health problems, including insomnia, hal-

lucinations, vitamin deficiency, several types of cancer and, in rare cases, death. Subramanian's team wanted to develop a quick and easy way for consumers to determine whether the caffeine levels in their foods and drinks fall within a safe range.

They tested an enzyme called caffeine dehydrogenase and found that it could detect caffeine in a variety of drinks — with the exception of teas — within one minute. Also, it was sensitive enough to pick up on caffeine's presence at concentrations as low as 1 to 5 parts per million, the maximum limit the Food and Drug Administration advises for nursing mothers. They say that their method could be integrated into a dip-stick type of test, like over-the-counter pregnancy tests, that could be used at home.

The authors acknowledge funding from the University of Iowa Research Funds.





# Around the Area

## University of Arkansas

### Publications

Woods, S.D., R.D. Skinner, A.M. Ricca, A.T. Brown, J.D. Lowery, M.J. Borrelli, **J.O. Lay**, W.C. Culp. *Progress in Dodecafluoropentane Emulsion as a Neuroprotective Agent in a Rabbit Stroke Model*.

**Molecular Neurobiology**, 48:2, 363-367 (2014).

Shinn, S., **R. Liyanage**, **J. Lay**, A.

Proctor. *Improved fatty acid analysis of conjugated linoleic acid-rich egg yolk triacylglyceride and phospholipid species*. **J. Ag. Food Chem.** 62, 6608-6615, (2014).

Sivakumar, G., K. Jeong, **J. O. Lay**. *Bioprocessing of *Stichococcus bacillaris* strain siva2011*. **Biotechnology for Biofuels**, accepted 7:62 (2014) doi:10.1186/1754-6834-7-62.

Packialakshmi, B., **R. Liyanage**, K.S. Rasputra, **J.O. Lay, Jr.**, N.C. Rath. *Isolation and characterization of chicken bile matrix metalloproteinase*. **Poultry Science**, accepted (2014).

### On the Go

**Sakon, J., R. Bauer, K. Janowska**, J. Sanders, D. Weir, M. Tucker, et al. *Collagenolysis mechanism of bacterial collagenases*. Gordon Research Conference, Microbial Toxin and Pathogenicity, Waterville Valley, NH, July 20-25, 2014.

**Josh Sakon** presented a talk **Entrepreneurship** at the Gordon Research Conference Lunch & Learn meeting in Waterville Valley, NH, July

21, 2014.

**Chen, Jingyi**. *Site-Selective Seeded Growth of Bimetallic Nanostructures and their Catalytic Applications*. Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY, August 1, 2014.

**Kola Ayinuola** presented a poster *Recent advances in azolebased Claisen rearrangements* at the national ACS meeting in San Francisco, CA, August 11-14, 2014. It is coauthored by **Lin Chin** and **Matt McIntosh**.

**Matt McIntosh** gave a talk *Rearrangement Pathways of the Breslow Intermediate*, July 30, 2014, at the 4th annual Telluride Conference on Accelerating Reaction Discovery in Telluride, CO, coauthored by **Sefat Alwarsh** and **Kola Ayinuola**.

**Feng Wang's** laboratory group presented three posters at the American Conference on Theoretical Chemistry, July 20-25, 2014, in Telluride, Colorado: *Pairwise-additive Force Field for Ions from Adaptive Force Matching*, Jicun Li and Feng Wang;

*A Polarizable Water Model Developed with the Adaptive Force Matching Method*, Saieswari Amaran, Tomasz Janowski, Peter Pulay, Revati Kumar, Tom Keyes, and Feng Wang; and

*On the Transferability of Three Water Models Developed by Adaptive Force Matching (AFM)*, Hongyi Hu, Zhonghua Ma, and Feng Wang.

**Tomasz Janowski** gave an oral presentation at the 248th ACS National Meeting in San Francisco: **T. Janowski and P. Pulay**, *Localized Laplace Transformed Coupled Cluster Laplace Transformed Perturbative Triples Correction in Quasiatomic Orbitals*. At the same meeting, **Peter Pulay** gave an invited oral presentation: **P. Pulay, T. Janowski, K. Wolinski**, *Generalized Multipole Polarizabilities and their use in Ultrafast AM/MM Simulations*.

## Recognition

**Paul Adams** received notification from the Arkansas Science & Technology Authority (ASTA) that his project *Characterization of the Novel Features of Interactions Involving the Ras-Related Protein, Rheb, and Tuberous Sclerosis Complex 2*, was funded for a period of one year. He also was invited to speak on a diversity panel during the 4th Annual Arkansas ASSET Initiative Project Meeting to be held September 5, 2014. Arkansas ASSET Initiative is a National Science Foundation EPSCoR project composed of 3 research themes: Biotechnology, Solar Energy and Grid-Integration for Renewable Energy.

## UT Dallas

Two recent graduates from the Department of Chemistry earned honors at the annual national meeting of the North American



Membranes Society held in Houston. Dr. **Nimanka Pathum Panapitiya** received an award from the Journal of Applied Polymer Science for the contributions of his research toward development of polymer sci-

ences. Dr. **Sumudu Nelukshi Wijenayake** won second place in a poster competition for her work involving mixed-matrix membranes for hydrogen and carbon dioxide separations.



Three chemistry faculty earned university recognition; Dr. **Claudia Taenzler** received this year's President's Teaching Excellence Award for Non-Tenure Track Faculty.



Dr. **Mihaela Stefan** received the President's Outstanding Teaching Award.



Dr. **Paul Pantano** received the Provost's Award for Faculty Excellence in Undergraduate Research Mentoring and the School of Natural Sciences & Mathematics' Outstanding Teaching Award.



*Below are some URLs with more photos:*

[UT D Chemistry Alums Earn Accolades President's Teaching Award Award-Winning Chemistry Teacher Provost's Award for Undergrad Mentor Teachers and Advisors' Awards](#)

## UT Arlington

The 2014 Marcel Golay Award was presented to UT-Arlington Welch Professor **Daniel Armstrong** at the 38th International Symposium on Capillary Chromatography held in Riva del Garda, Italy, in May, 2014. Dr.



Armstrong was selected by the Award Committee, chaired by Professor Milos Novotny of Indiana University, for his pioneering work in the development of capillary chromatography. The award was presented by Andrew Tipler on behalf of Perkin-Elmer, who sponsored the award. Dr. Marcel Golay worked as a senior scientist at Perkin-Elmer up until his death in 1989. Dr. Armstrong gave plenary lectures on the following dates: May 29 at the 17th Cyclodextrin Symposium in Saarbrücken, Germany; June 30 at ILSEPT-2 in Toronto, Canada; July 28 at Chirality, 2014 in Prague; and Aug. 6 at the August Land O'Lake Conference, in Madison, WI.



Professor **Kenneth Schug** received a \$25,000 UT System Regents Outstanding Teaching Award. He was one of four winners from UT-Arlington and one of 95 winners system wide. As a special honor, he was asked to present his teaching philosophy to the UT System Board of Regents during their meeting on Aug. 20. He gave an invited talk at the Conference on Small Molecules in Science in Williamsburg, VA, in mid-August. His post-doc Dr. **Hui Fan** gave both an oral and a poster presentation at the San Francisco ACS meeting.

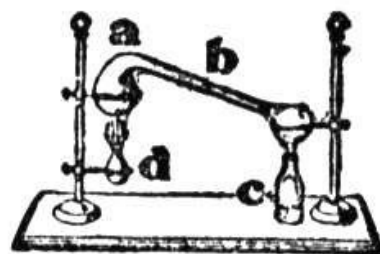


Dr. **Brad Pierce** gave a poster presentation in July at the Gordon Research Conference on *Enzymatic Catalysis in Health and Disease*. His coauthor was **Bishnu P. Subedi**.

Dr. **Alejandro Bugarin** participated in two workshops this summer. One was an NIH workshop held in Dallas Aug. 5-7. The other was a week-long conference at Stanford, July 14-18. Dr. **Xiaojun Huang** has recently joined Dr. Bugarin's group.



Dr. **E. Thomas Strom** gave an oral presentation to the ACS History Division at the San Francisco ACS Meeting in August with the title *Charles Hampton Research Chemist. Did this Book Attract Young Adults to Careers in Chemistry?*



**Retort.**

*a, retort; b, adapter; c, flask; d, lamp.*



Department of Chemistry and Biochemistry  
P.O. Box 425859, Denton, TX 76204-5859

### **Fall 2014 Seminar Series**

**September 26**

Dr. Smith T Powell

Berea College (Retired)

*"Lives of stars and the evolution of the elements"*

**October 3**

Dr. William E. Acree

University of North Texas

*"TBD"*

**October 10**

Dr. Susan Pedigo

University of Mississippi

*"TBD"*

**October 17**

Dr. Kayunta Johnson-Winters

University of Texas at Arlington

*"TBD"*

**October 24**

Dr. John J. Correia

University of Mississippi

*"Hydrodynamic, Thermodynamic and Structural Characterization of Elastin-Like Peptides"*

**November 14**

Dr. Matthew Auton

Mayo Clinic Division of Hematology Research

*"TBD"*

**December 5**

Dr. Joseph P. Emerson

Mississippi State University

*"TBD"*

All seminars will be presented in 251 Ann Stuart Science  
Complex (ASSC) at 12:00 PM



## IN MEMORIUM

### Virginia Louise Marshall



Virginia (Jenny) Louise Marshall nee Rankin, 68 years, passed away on September 8, 2014, suffering from a heart attack four days earlier. She was born in Wichita Falls on November 20, 1945. Her father, James Leon Rankin, was a multi-talented Texan who was a teacher, preacher, cow puncher, horse breaker, and oilman; and her artistic mother, Lucile nee Barton, a homemaker, restaurant manager, and a nurse. Virginia gained her secondary school education in various schools across Texas as her father traveled about; they eventually settled in Big Spring where she gained her high school education, graduating in 1963. From Texas Woman's University she gained a B.S. magna cum laude in 1980 and a M.Ed. with specialty in computer science in 1983. She was a Mortar Board member, Pi Sigma Alpha, 1980. She taught at Jefferson Davis School in Denton from 1980 to 1985, and then Calhoun Junior High and Middle School in Denton from 1986 to 2003, where she taught computer classes and photography. She married Dr. James L. Marshall, Professor of Chemistry at the University of North Texas, in 1998, and the pair had been active ever since as a team in the international "Rediscovery of the Chemical Elements" project, covering over twenty countries which has culminated in over 60 publications, a 15-year span of American Chemical Society lecture tours, and a DVD used in classrooms across the country. Virginia was a member of Delta Kappa Gamma International, Iota Iota Chapter (1987), and was initiated as a proud member of the Daughters of the Republic of Texas in 2013.

Virginia is survived by two sons, Robert Edgar Lumpkin, 45 years, San Diego, CA, and James Everett Lumpkin, 40 years, Austin, TX, who with Ashley Brook nee Bailey has three children Kinsley (8), Evangeline (Evie, 3), and Anderson (2); by nephews John David Harris (51) of Austin and Michael Raymond Harris (53); and by a sister Annie Margaret Warner (74) of Durham, NC; and by her husband James (Jim) Marshall.

Full of brilliance and visionary goals, Jenny was an impressive harmony of beauty and professionalism. With a winning smile and a gracious heart, Virginia was loved by all, winning over the hearts of everyone she met. Jenny was an amazing person, always so cheerful and upbeat, and enthusiastic about everything she did. Her positive perspective, enthusiasm, and love of learning will always serve as a role model for others. Heaven is now graced with her wonderful spirit, and we shall miss her deeply.

Memorials may be made to: Marshall Education Fund, P.O. Box 6, Denton, TX 76202.

## Exploring 3-D printing to make organs for transplants

### *Study of Droplet Formation Process during Drop-on-Demand Inkjetting of Living Cell-Laden Bioink*

*Langmuir*

Printing whole new organs for transplants sounds like something out of a sci-fi movie, but the real-life budding technology could one day make actual kidneys, livers, hearts and other organs for patients who desperately need them. In the ACS journal *Langmuir*, scientists are reporting new understanding about the dynamics of 3-D bioprinting that takes them a step closer to realizing their goal of making working tissues and organs on-demand.

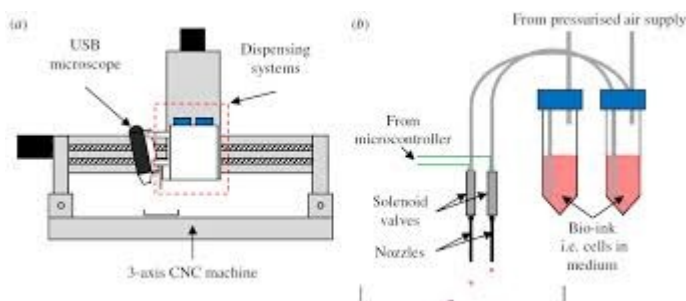
Yong Huang and colleagues note that this idea of producing tissues and organs, or biofabricating, has the potential to address the shortage of organ donations. And biofabricated ones could even someday be made with a patient's own cells, lowering the risk of rejection. Today, more than 120,000 people are on waiting lists for donated organs, with most needing kidney transplants. But between January and April of this year, just short of 10,000 people received the transplant they needed. There are a few different biofabricating methods, but inkjet printing has emerged as a frontrunner. It's

been used to print live cells, from hamster ovary cells to human fibroblasts, which are a common type of cell in the body. But no studies had been done to really understand how biological inks behave when they're dispensed through printer nozzles. Huang's team set out to fill that gap.

They tested bioinks with different concentrations of mouse fibroblasts plus a hydrogel made out of sodium alginate. They discovered, among other findings, that adding more cells in the material reduces both the droplet size and the rate at which it gets dispensed. The new results will help scientists move forward with this promising technology.



The authors acknowledge funding from the National Science Foundation.



## FIVE QUESTIONS FOR...

**Beatriz Rios-McKee**, PhD, has graciously agreed to be the interviewee for the 2014-2015 '5 Questions' Season. In addition to working diligently on SWRM 2014

([www.swrm2014.org](http://www.swrm2014.org))

and other ACS opportunities, Dr. Rios-McKee uses her diverse background to promote Entrepreneurial ventures, and as a STEM Evangelist. She is currently pursuing a Professional Masters of Business Administration (PMBA) at the Cox School of Business. Among Dr. Rios-McKee's intense ACS activities are Chair, ACSDFW Younger Chemist Committee (2013 – Present); Program Co-chair, Division of Chemical Education, 250th ACS National meeting, Boston, MA (2014-2015); Contributing Member, ACS Presidential Task Force on Supply & Demand of U.S. Chemists and Jobs: “Vision 2025: Helping ACS Members Thrive in the Global Chemistry Enterprise” (2013 – 2014); Program Co-chair, Division of Chemical Education, 247th ACS National meeting, Dallas, TX (2013 – 2014); Member-at-Large, Graduate Education Advisory Board to the Graduate and Postdoctoral Scholars Office ACS (2013 – 2014); Symposium Organizer, “Chemistry by Design: building at the molecular level”, Graduate Student Symposium Planning Committee, 242nd ACS National meeting, Denver, CO (2010 – 2011); Organizer, Chemistry Summer Camp for High School Students, Southern Methodist University (2010);



Graduate Student Member, Graduate Education Advisory Board to the Graduate and Postdoctoral Scholars Office, National ACS (2009 – 2012) and Graduate Education Advisory Board liaison to the Younger Chemists Committee, National ACS (2009 – 2012)

### 1. *How old were you when you realized you wanted to be a scientist?*

24 years old. In high school I was bad at math and science; it was only after getting my first undergraduate degree that I wondered why I never tried to conquer those subjects. I didn't want to look back on my life asking "what if?" and to regret not having tried. I went back to school and in Ed Biehl's organic chemistry class (at SMU), I realized I loved O-chem (organic) and signed up to do undergraduate research. One thing led to another and I ended up with a PhD in chemistry.

### 2. *Did your chemistry education prepare you for your career? If not, what training have you added to your skills?*

My education did not, but I had a very supportive PhD advisor, Dr. Mike Lattman. I was able to participate in leadership activities and volunteer for ACS. With support from the division of chemical education and the ACS graduate and postdoctoral scholars office, we formed a group of graduate students to organize a symposium at a national meeting. The skills I gained from that experience (fundraising, grant writing, report preparation, etc.) are the skills I have found most valuable.

3. *ACS benefits greatly from member volunteerism, including your considerable donations. What would you say to chemists who are considering adding an ACS volunteer activity to their already busy lives, especially if they're not sure the added expenditure of effort is worthwhile?*

The "soft skills" you gain and opportunities for professional development are worth your time, especially if you are a student, an early career chemist or considering a career change. I'll be frank, more PhDs are graduating each year than there are academic positions to be filled. It is important to not get tunnel vision and to keep an active interest in career paths. ACS has a wealth of resources for graduate students and postdocs...and you are paying for your membership – get your money's worth!

4. *Your education and areas of expertise are diverse. How would you most like to apply your knowledge and skills in the future (i.e., What is Your Dream Job)?*

My dream job is to be on the President's Council of Advisors on Science and Technology (Yes, the President of the United States – I like telling people what I think they should do!).

5. *Who is your Science Hero? and why?*

"The Great Explainer" Richard Feynman, for his unique and multi-faceted personality and his commitment to making scientific topics accessible. In case you didn't know, this month Caltech released a free online edition of The Feynman Lectures on Physics:

[www.feynmanlectures.caltech.edu](http://www.feynmanlectures.caltech.edu)



*Yes, he's playing the drums!*  
[youtube.com \(Feynman drums\)](http://youtube.com/FeynmanDrums)

You can also watch seven classic lectures by Richard Feynman:

<http://io9.com/watch-a-series-of-seven-brilliant-lectures-by-richard-f-5894600>

*Editor's note:*

In the May **RETORT**, Tom Strom did an interview with the ACS president-elect, Dr. Marinda Wu. On page 12, Tom asks about chemistry jobs, and she mentions the task force on which Dr. Rios-McKee served (supply and demand of chemists). Dr. Wu is publishing that report as a book chapter in an ACS Symposium Book this fall.

Thank you, Dr. Rios-McKee, for participating in '5Q'!

To sign up to be interviewed for 5Q, contact: [retort@acsdfw.org](mailto:retort@acsdfw.org).



# From the editor

As is usual for the first **RETORT** of the year, it's a packed issue. In the next few months, we have two major ACS event coming up: SWRM 2014 and National Chemistry Week, so be sure to volunteer and attend. The EarthWindFire Summit in early October looks like a great event for everyone involved in any aspect of climate change.

Bob Landolt and I are soliciting papers for our Sustainability/Climate Change/Water symposium at SWRM. So, rather than writing an editorial, I cut-and-pasted for you a cartoonish expression of the global warming crisis and some of the current state of affairs. Hopefully, if we have any duking it out in the symposium, Bob can control the fracas.

*Best regards,  
Connie*

