THE VORTEX

AMERICAN CHEMICAL SOCIETY **CALIFORNIA SECTION**
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California ACS Members visit Senator Boxer's Office on Capitol Hill
Dr. Julia Lyubovitsky (UC Riverside), Mitch Andre Garcia (UC Berkeley), Dr. James Postma (CalACS), Dr. Sonja Strah-Pleynet (San Diego Section), Dr. Marinda Wu (CalACS), Dr. Sheila Kanodia (CalACS). (back row left to right) Dr. Don Maclean (CalACS), Dr. Bryan Balazs (CalACS). Photo by Dr. John Palmer (UC San Diego).

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REPORT FROM THE ACS NATIONAL MEETING

Highlights from the Washington, DC meeting August 15-20, 2009:

Surprisingly, with the continuing down economy, the Fall National ACS meeting in DC had the highest attendance of any National meeting in DC, with 14,319 registrants.

The overall theme of the meeting was "Chemistry and Global Security: Challenges and Opportunities," with a secondary theme of "Chemical Education at a Crossroads." A Sunday evening key note address was followed by a reception and an early opening to the exhibit area, that once again conflicted with the Town Hall meeting for candidates for regional Directors and the Councilor caucuses.

Abstracts of the over 8000 papers and posters presented at the meeting are still archived at www.acs.org. One hundred and sixty eight of the plenary and symposium presentations were recorded and will be available with sequenced slides on the website to anyone after September 18th including meeting registrants. They can be accessed by meeting badge registration number from September 4th through 18th.

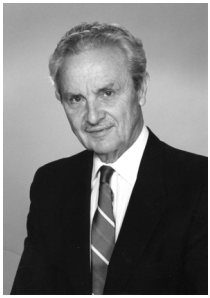
The inaugural event recognizing the first class of 162 members to be honored as ACS Fellows for the combination of their professional accomplishments, ACS involvement, and contributions to society, was held and presided over by immediate Past ACS President, Bruce Bursten, who had initiated this program as one of his presidential objectives.

The Grady-Stack Award for Science Writing was presented to Nobel Laureate, Roald Hoffman, at a reception at the National Press Club.

Data from the ACS Career Fair at the DC meeting suggests that the employment situation is still very challenging, and tempered further by comments from job applicants that some companies appeared to be interviewing but did not have any actual positions available.

Report from Society governance activities: California Local Section Councilors, our Board member, and our former ACS President were very active in Washington, DC in representing the section at numerous governance functions including the Board (Wu) and the ACS Society Committee on Education (Balazs - Chair), Local Section Activities (Latimer - appointed chair for 2010), Community Activities (Kanodia), Economic and Professional Affairs (Pavlath), and Membership Affairs (Frishberg). Lee Latimer also completed his year as Chair of the Western Councilors Caucus.

(Continued on page 6)



MODERATION AND COMMON SENSE XVI.

A. Pavlath

In nuclear fission, the energy released equals the change of the total mass based on $E=mc^2$. The energy can be in the form of heat and high-energy particles. Generally, the resulting mixture also has some radioactivity, which results in disposal problems as described in the previous article.

In fission, when atoms fuse into a higher atomic weight atom with a weight loss, the mass difference will show up as energy. A unstable atom may break up into smaller pieces. Can two atoms fuse with a favorable (stable) change in the total mass? The answer is yes, but with some difficulty!

In the nucleus of an atom, the neutrons reduce the repulsion between the protons, that increases with the atomic weight. This is one of the factors which may make an element of high atomic number, such as uranium, unstable enough to undergo fission. On the other hand, the fusion of two nuclei into one has to overcome the repulsion between them, which decreases with the number of protons in the nucleus. Consequently, elements at the low end of the periodic table, i.e., hydrogen, helium and lithium are the most likely candidates for fusion. For practical purposes, there are two possible reactions, both are based on hydrogen isotopes: deuterium (D) and tritium (T)

$$2D+3T = 4\,He + n$$
$$2D+2D = 3\,He + n$$

The latter reaction can also provide hydrogen instead of a neutron. Actually, the fusion of deuterium and tritium was accomplished more than fifty years ago in the form of the H-Bomb. The fusion does occur in a high temperature plasma where the electrons are removed from 2D and 3T, and then the two bare nuclei may be forced to fuse. The problem is that this will occur at 2 million degrees Kelvin. In the H-bomb this chain reaction resulted in the instant release of a tremendous energy. Without going in more technical details, there is no way to build a "nano" H-bomb where the rate of energy formation can be safely regulated. However, by building a reactor where one could maintain such high temperature, these two hydrogen isotopes could react without the fear of explosion by regulating the reaction by controlling their flow. There would be no chain reaction. While there is no structural material which could withstand such temperature, a space within a structure could be isolated and a high temperature zone could possibly be delimited using magnetic fields. The fusion of deuterium and tritium was achieved within such a "magnetic bottle".

Is there a problem? Yes, the energy required to maintain such magnetic confinement is more than the resulting energy. Initially, the energy return was only in the 2-4% range, which has increased to 32%, but until it goes over 100%, it is still only a promising interesting scientific experiment. However, 34 nations have faith that it can be realized. They put their money where their mouth is. The union of 28 European nations, China, India, Japan, Korea, Russia and the United States are providing 10 billion euros for the building of an experimental reactor (ITER) in Southern France to solve the problem.The plans for ITER calls for a plasma volume of 840 m^3 with a temperature of 150 million degrees Kelvin, ten times the core temperature of our Sun. The projected energy return is also ten times: output is 500MW versus an input of 50MW.

Will fusion be the ultimate solution to our energy problem? Deuterium as D_2O, can be separated through distillation. It represents only 0.015% of the total amount of water supply. It can provide enough energy for the whole word with increasing population for 100,000 years. While tritium appears in nature only in very small quantities, it can be obtained from lithium:

$$7Li + n = 3T + 4\,He + n.$$

Our planet has enough lithium for a million years. There is no environmental and very little safety problem. The opponents of fu-

(Continued on page 5)

California Section
American Chemical Society
October Meeting

Title:"Health Benefits of Wine as Part Of Your Evening Meal" By Valery Uhl, MD
Date: Wednesday, October 28, 2009
Time: 6:00 pm Social Hour, 7:00 pm Dinner, 8:00 pm Talk
Place: Buttercup Grill, 229 Broadway, Oakland, CA (near Jack London Square)
Cost: $24 (Students $12)
Dinner choices: Fresh Red Snapper, or Lemon Pepper Chicken, or Top Sirloin Steak
Reservations: RSVP by Wednesday, October 21, 2009 to the Section office by e-mail office@calacs.org or call (510) 351-9955

Abstract:

As chemists we know that simple alcohols are poisonous compounds. Ethanol is just the least toxic to humans. Many "toxic" compounds, however, are beneficial to humans in small doses. After defining "moderate alcohol consumption" and explaining the "French Paradox", Dr. Uhl will go into the health benefits of moderate alcohol consumption. She will balance the benefits against the known hazards of over-consumption of alcohol. The talk will cover the health benefits of wine and contrast consumption with and without being part of a meal. Some of the components of wine that might be responsible for its beneficial nature will be discussed. Dr. Uhl will bring some wines for tasting.

Biography:

Dr. Valery Uhl is a radiation oncologist practicing in Oakland. She received her MD degree from UC San Francisco. She is Chief Judge and Director of the "North of the Gate" Wine Competition in Petaluma and is an internationally recognized wine judge. While working on her B.S. degree in Wildlife and Fisheries Biology at UC Davis, she was a taster for the departments of Enology and Food Science. Her family owns TnT Vineyards in Sebastopol.

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(Continued from page 5)

sion research claim that economic fusion is impossible. However history taught us to be very cautious to state that something is impossible. As an ecample in 1884, the gathering of the world best physicists came to the solemn conclusion that a heavier than air flying machine is impossible, mankind will never fly! Tune in next month for the continuing saga of our search to solve our energy problem.

(continued from page 3)

Other California section Councilors or substituting Alternate Councilors present at the Council Meeting were Eileen Nottoli, Don MacLean, Rollie Myers, and Jim Postma.

The controversial issue of whether the ACS Constitution and Bylaws should be amended such that petition candidates for ACS President would be vetted and voted on by Council, along with the nominees brought forward by the Committee on Nominations and Elections, prior to being put on the fall election ballot for full member voting, was the subject of two conflicting petitions and the primary topic of a heated debate at the Council meeting. A normal bylaws petition initiated by the Committee on Nominations and Elections offered such an amendment, as well as a shortening of the timeline for the presidential campaign. An opposing petition for urgent action was also presented that proposed a Constitutional amendment insuring the right of a petition candidate to go directly to the full membership election ballot. While the urgent action petition did not receive the 75% vote needed to move it onto the DC Council agenda, it did show that Council was split fairly evenly on this subject and this petition will remain under consideration for normal action at the next Council meeting in San Francisco in March 2010. The normal bylaws petition was then debated with similar energy and the extended emotional discussion was defused by a motion to recommit the petition on the grounds that it attempted to combine two unrelated themes, the change in the petition process, which was very controversial, and the proposed shortening of the campaign period, which was not. Revisiting these issues should make the next Council meeting a lively affair.

In other Council action of note, the Division of Chemical Technicians (TECH) was dissolved upon the recommendation of that Division and concurrence from the Committee on Technician Affairs.

The Board of Directors accepted a recommendation of the Task Force on Education and provided funding for three years for a Science Coaches initiative to provide support for high school teachers.

The Local Section Activities Committee has funded 19 new innovative program grants worth $45,000. A new grant program, named "Bridging the Gap" was initiated to provide up to $250 for supporting local section events to help attract more student members.

Looking ahead to San Francisco - March 21-25, 2010, the overall meeting theme will be "Chemistry for a Sustainable World" with symposia on energy sustainability and alternative energy, along with secondary themes and symposia on "Frontiers of Material Science" and "Global Skills for the Global Marketplace."

News you might use:

In addition to the usual employment information, the ACS Careers website (www.acs.org/careers) now includes retirement planning resources and services for unemployed ACS members. Another website up and running to present an overview of member benefits and help in professional career planning is www.acs.org/now and contains links to various resources organized under the four headings of Advance, Collaborate, Learn, and Lead.

The Office of Public Affairs has launched a new program called Chemistry Ambassadors to assist ACS members who are interested in public outreach. Information can be found at www.acs.org/chemistryambassadors.

Efforts continue to prepare for the United Nations designated International Year of Chemistry in 2011. To keep tabs of the many ACS activities that will be developed in coordination with this event, go to IYC2011@acs.org.

The theme for NCW to be held Oct. 18-24 is "Chemistry - It's Elemental" and the theme selected for 2010 is "Behind the Scenes Chemistry."

All requests for the 10,000 donated copies of the Merck Index have been filled and 2000 extra copies remain that can be claimed through a request to the Local Section Activities Committee. Delivery of the Indexes is expected in September.

Mark Frishberg,
CAL ACS Councilor

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- http://www.calacs.org/page.asp?id=22

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