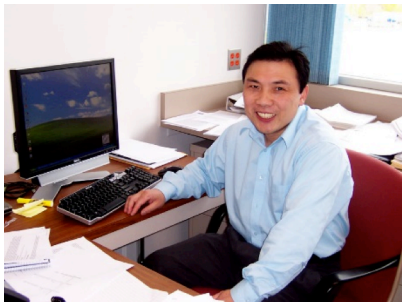
ACS Division of Energy & Fuels

2015 Spring Newsletter

http://web.anl.gov/PCS/ENFL/

Letter from the Chair:

Yun Hang Hu



Welcome to the 2015 Spring ENFL Newsletter. It is my distinct honor to serve as the Chair of the ACS Division of Energy and Fuels (ENFL). Time goes by so fast; three years have passed since the Fuel Chemistry and Petroleum Chemistry divisions merged form the Energy and Fuels division in 2012. I would like to take this opportunity to thank all officers and members who have made contributions to the successful transition period of our division.

Without doubt, one of the most important benefits of ENFL membership is the opportunity to be directly connected to such an outstanding community of professionals, and the primary goal of the ENFL leadership is to be responsive to the needs of our membership. You are highly encouraged to present your research in the ENFL symposia at ACS national meetings and to provide comments and suggestions that will guide our future activities. Furthermore, I hope you will consider joining our team of volunteers as ENFL officers.

One of the important services that ENFL provides is its scientific programming at ACS national meetings. Thanks to the outstanding efforts by Alissa Park, our 2015 program chair. In 2015 ENFL Spring program (at the 249th ACS National Meeting in Denver during March 22-26, 2015), 416 papers were presented in 49 oral sessions and 1 poster session. This program covers a broad range of energy topics, including "Materials and interfaces in lithium batteries and beyond", "Hybrid functional porous materials for sustainable energy", "Nanomaterials for Solar Energy Conversion and Storage", "Negative Carbon Emission Technologies", "Heavy Oil Upgrading, Production & Characterization", "Enhanced Extraction and Utilization of Unconventional Energy Sources", "C1 chemistry", "Catalysis for Un-conventional Energy", "Two-Dimensional materials for energy and fuels", "Chemistry of Energy & Fuels", and

"Advances in Chemistry of Energy and Fuels". There was also an Award Symposium to honor Dr. James Burrington (the Lubrizol Corporation), winner of the 2015 Distinguished Researcher Award, in the ENFL program. It consisted of 22 presentations from Lubrizol Corporation, Fram Filtration, University of Delaware, University of California at Berkeley, INEOS, California Institute of Technology, and Louisiana State University, respectively.

Congratulations to Ripu, Philip, Andy and Jin. Every year, ENFL division recognizes excellent scientists and engineers in energy areas by division awards. Dr. Ripu Malhotra (SRI International) won the 2015 Henry Storch Award. An award symposium to honor Dr. Malhotra will be held in the 2015 ENFL fall program (at the 250th ACS national meeting at Boston).

The ACS ENFL division and ACS "*Energy & Fuels*" journal have established "Energy & Fuels Joint Award for Excellence in Publication". Dr. Phillip E. Savage (Penn State University) has been selected as the first winner of the award. Dr. Savage will be honored by a symposium in the 2015 ENFL fall program at Boston.

Dr. Andy Herring (Colorado School of Mines) has been selected as the winner of 2015 Energy and Fuels Division Distinguished Service Award and Dr. Jin Zhang (University of California at Santa Cruz) for the Glenn Best Paper Award presented at the ACS Fall 2014 conference.

Finally, I would like to thank the program chairs, program secretaries, preprint editors, and symposia organizers as well as program committee members for their great efforts in developing excellent ENFL programs. Thank you as well to the secretary, treasurer, councilors, trustees, award chair, newsletter editor, past chairs, and chair-elects for their great contributions to the successful operation of the ENFL Division.

Yun Hang Hu

2015 Chair, ACS Energy and Fuels Division

2015 Storch Award.

Ripu Malhotra

The Division of Energy & Fuels of the American Chemical Society has selected Ripudaman (Ripu) Malhotra as recipient of the 2015 Henry H. Storch Award. Chosen for contributions to the field of fuel science and energy technology in a broad range of areas, he has focused in his laboratory work on the mechanisms of coal liquefaction and gasification, the formation of retrograde products during such "upgrading," the structure of coal liquefaction products, heavy petroleum fractions, and tar-sands upgrading products.

Ripu received his Ph.D. in organic chemistry in 1979 from the University of Southern California under Nobel Laureate George Olah. He is the author or co-author of four books and over 90 articles in scientific journals. He currently serves as the Associate Director of the Chemical Sciences and Technology Laboratory at SRI International in Menlo Park CA, and as associate editor for the Journal of Sustainable Energy Engineering.

In his laboratory work, he and his co-workers have clarified the multiple roles of hydrogen transfer in fossil fuel conversions, identifying a new pathway for hydrogen transfer. This work was facilitated by the use of field-ionization mass spectrometry (FIMS) coupled with liquid- and gas-chromatography to track many of the complex products, and elucidated the chemistry of retrograde reactions that often accompany "upgrading" and lead to deposit formation in the use of diesel and jet fuels as well as in coal liquefaction and heavy-oil upgrading. This work led to the development of a group additivity relationship helping to quantify the correlation between functional groups and the sooting tendency of fuels.

His early experience in the mechanisms of nitro compound formation enabled him to identify the surface-catalyzed hydrolysis of chlorine nitrate as the key reaction in formation of the Antarctic ozone hole. Similarly, his familiarity with FIMS analyses of heavy fossil fuels – and the occasional unexplained appearance of mass spectral peaks at the unusual mass of C60 and related compounds – led to the development of processes for producing fullerenes, nanotubes, and related materials.

During the last several years he co-authored the book A Cubic Mile of Oil: Realities and Options for Averting the Looming Global Energy Crisis. This book frames the discussion of energy sources in terms of an easily understandable common volumetric unit (a "CMO") that avoids the need for repeated inter-conversion between units of energy differing by many orders of magnitude. It has been followed by Ripu's recent application of learning curve methodology to compare likely time frames for large-scale introduction of new/modified energy production technologies to the market place.

He has most recently led a team that developed a laboratory-scale, radiatively-heated high-pressure, high-temperature flow apparatus, which allowed elucidation of the effect of pressure and temperature on the simultaneous gasification of coals and reforming of natural gas to H_2 and CO. The observed stoichiometry would allow production of liquid fuels via methanol in a process that produces no CO_2 and consumes no water, and is estimated to have capital outlays of roughly half those of conventional Fischer-Tropsch approaches.

The Henry H. Storch award is given to recognize distinguished contributions to fundamental or engineering research on the chemistry and utilization of all hydrocarbon fuels. It is sponsored by the ACS Division of Energy & Fuels. Ripu Malhotra will be honored at the Storch Award Symposium at the Boston ACS National Meeting.

Energy & Fuels Joint Award for Excellence in Publication 2015

Phillip E. Savage

Phillip E. Savage is the Head of the Chemical Engineering Department at Penn State and the Walter L. Robb Family Chair. Phil is also Arthur F. Thurnau Professor Emeritus at the University of Michigan. Phil is a Fellow of both the AIChE and ACS and Editor-in-Chief of I&EC Research. He is past-chair of the Industrial & Engineering Chemistry Division of ACS and a past-chair of the AIChE Catalysis and Reaction Engineering Division. Phil's professional service also includes membership on NRC committees dealing with treatment of stockpile munitions and chemical agents and being an expert reviewer for the U.S. EPA Report to Congress entitled "Biofuels and the Environment: First Triennial Report to Congress".

Phil has published about 200 research articles in archival journals and given nearly 90 invited lectures at other universities and international symposia. He holds three U.S. patents, two of which have been licensed and put into practice commercially. He has two additional patent applications pending related to his work on algae biofuels. Phil's research deals broadly with reaction kinetics, pathways, and mechanisms and his recent work focuses on hydrothermal conversion of biomass to fuels. He is widely recognized as a leader in applying catalysis to reactions in near- and supercritical water. Phil has mentored 41 PhD students, nine of whom have been NSF and/or EPA STAR graduate fellows. He received the 2014 Research Excellence Award from the AIChE Sustainable Engineering Forum, the Inaugural (2009) Michigan Governor's Award for Green Chemistry, and the 2001 National Catalyst Award from the American Chemistry Council in recognition of his outstanding teaching and contributions to chemical education.

2015 ENFL Distinguished Service Award

Andy Herring has been selected as the winner of 2015 ENFL Distinguished Service Award. Andy made distinguished contributions to the ENFL (and former FUEL division, including; organizer for 16 symposia, Programming Committee Member (2009–present), Program Secretary (2010–2014), Division Chair (Fuel Chemistry, 2011), Program Secretary (Fuel chemistry, 2010 – 2012), MPPG Representative (2010-2011), Program Chair (Fuel chemistry, 2009) and so on.

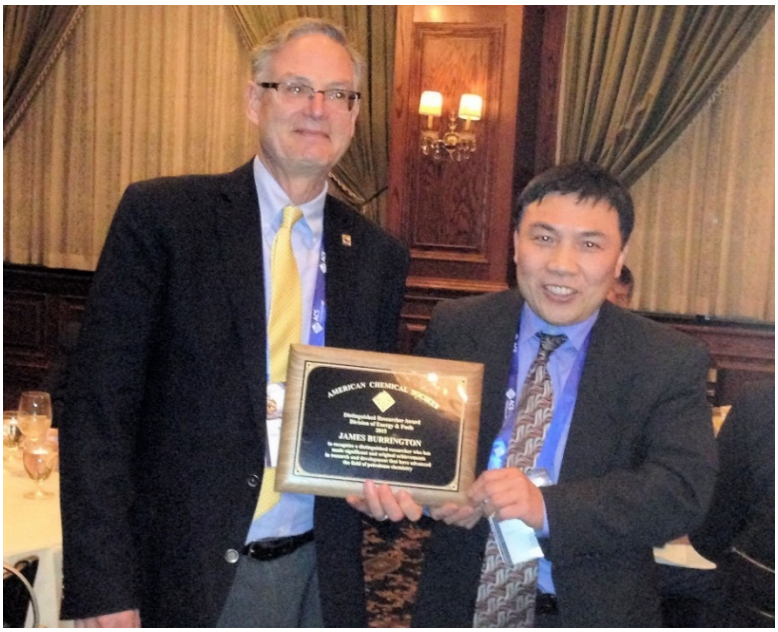
The Distinguished Service award is limited to individuals who have been members of the division for at least ten years and who have had a significant and continued impact on the advancement of energy and fuels chemistry through research, teaching, service or a combination of the three over an extended period of time.

ENFL Glenn Award for Best Paper

Dr. Jin Zhang, a professor at University of California at Santa Cruz, has been selected for The Richard A. Glenn award from his outstanding paper and presentation at the Fall 2014 ACS meeting, "Effect of co-doping with trivalent cations on the primary dopant properties in Cu(I)-doped ZnSe quantum dots" presented at the 248th ACS National Meeting.

This award, for the most innovative and interesting paper presented at each ACS national meeting, was established in 1956, by the Division of Fuel Chemistry, in cooperation with Bituminous Coal Research, Inc. In 1972, the award was named in honor of Richard A. Glenn, who served as Assistant Director of Research at Bituminous Coal Research, Inc. and as Chairman of the Fuel Chemistry Division in 1960.

ACS Spring 2015, Denver, CO, Energy and Fuels Division Dinner.



(left to right) James Burrington (2015 Distinguished Researcher Award Recipient)

and Yun Hang Hu (ENFL Chair)

(left to right) Jin Zhang (Glenn Award Recipient)

and Yun Hang Hu (ENFL Chair)

2015 Fall ENFL program (250th ACS National Meeting, August 16-20, 2015, Boston)

Program Chair: Ah-Hyung (Alissa) Park

Program co-chair: Xianqin Wang

1. Innovative extraction and utilization pathways of unconventional hydrocarbon sources
2. Advances in petroleum engineering from discovery, analysis to applications sources
3. Innovative chemistry and electrocatalysis for low-carbon energy and fuels: discovery to application
4. Advances in Ceria based catalysis: Structure, electronic and chemical properties tailored for chemical conversion
5. Chemical looping innovation for low-carbon energy sources
6. Innovative electrochemical energy storage and conversion sources
7. Biofuels for Powering the World: discovery to application sources
8. Porous materials for Energy and Sustainability from discovery to application sources
9. Carbon Management: Recent Advances in Carbon Capture, Conversion, Utilization and Storage
10. 3rd International Symposium on Mesoporous Zeolites
11. Solar Energy and Solar Cells
12. Energy and Fuels Storch Award in Fuel Science: Symposium in Honor of Ripudaman Malhotra
13. Energy & Fuels Joint Award for Excellence in Publication: Symposium in Honor of Phillip E. Savage
14. Poster Session on Advances in Chemistry of Energy and Fuels sources
15. Sci-Mix

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