

Welcome to the American Chemical Society (ACS) Division of Energy & Fuels (ENFL) Spring 2020 Newsletter! With the first cancellation in the history of ACS National Meetings due to COVID-19, most of us have been isolated to work from home in the last few weeks for social distancing. More than ever, we realized how important our family and colleagues are to us and how much we are connected as a community. In the first newsletter in 2020 from the ACS Energy & Fuels (ENFL) Division, we wish our members to be safe and healthy, and stay optimistic while we stand strong at this unprecedented difficult time. In this newsletter, you will find a letter from the division chair, award announcements to some of our members, and new officers elected. The Award symposia planned for Spring 2020 has been rescheduled to fall 2020. If you submitted abstracts to other symposia for Spring 2020, you are welcome to submit your posters or presentations to SciMeetings, https://www.morressier.com/acs-scimeetings or consider to resubmit for future 2021 ACS meetings. Contact the ENFL Program Chair, Asanga Padmaperuma, at asanga.padmaperuma@pnl.gov if you have any question or concerns.

Letter from the Chair

Dear ENFL Colleagues,

It is a pleasant surprise for me to serve the *Energy and Fuels Division* (ENFL) as the 2020 Division Chair. Since 2006, I have been the ENFL member and had opportunities to work with the executive committee as the District IV representative. The precious opportunities for participating in ENFL activities allow me to grow academically.

Our officers, committee members, and volunteers have been contributing to the Division and ACS community for the betterment of Science, Technology and Engineering, with a focus on chemical sciences. The precious time and gracious support from all are the cornerstones for the division to move forward.



Finally, the members, especially the younger generations are critical for our division's further development. The ENFL will continue to organize the **Student Poster Award Competition** (**SPAC**). All students on undergraduate and graduate (master and Ph.D.) levels are encouraged to participate in **SPAC** at each National Meeting. The award is \$500 cash, a certificate and a Division dinner ticket.

I'm looking forward to another productive and joyful year of 2020! I am also eager to see you at one of our events in the future!

Respectfully,

Jingbo Louise Liu Professor, Department of Chemistry, Texas A&M University-Kingsville

Check us out on our social media sites!











Spring 2020 Newsletter **ENFL Awards**

We are pleased to announce that the <u>Henry H. Storch Award in Energy Chemistry</u> has just become an <u>ACS National Award</u> (effective 2020). Several of our members are being recognized for National and Division Awards as outlined below.

2020 George Andrew Olah Awardee (National): Dr. Harold H. Kung



Dr. Harold H. Kung is Walter P. Murphy Professor of Chemical and Biological Engineering at Northwestern University. He received his B.S. from the University of Wisconsin and a Ph.D. from Northwestern University.

His research interest focuses on heterogeneous catalysis but includes energy materials, synthesis of nanostructured materials, global energy supply and consumption, and sustainability. Throughout his career, he has been fascinated by the chemistry of selective oxidation of hydrocarbons and worked to understand and manipulate the catalyst property-selectivity relationship. He is the author of "Transition Metal Oxides: Surface Chemistry and Catalysis," (1989, Elsevier Science Pub.),

co-inventor of 6 patents, an editor of 5 monographs, and has published over 280 journal articles. A Fellow of the American Institute of Chemical Engineers (AIChE) and the American Association for the Advancement of Science (AAAS), he received the W.H. Wilhelm Award in Chemical Reaction Engineering (AIChE), *Gabor A. Somorjai* Award in Creative Research on Heterogeneous Catalysis (The American Chemical Society, ACS), *Ernest Thiele* Award (AIChE Chicago section), Robert Burwell Lectureship and *Paul H. Emmett* Award of the North American Catalysis Society, and most recently the *George A. Olah* Award in Hydrocarbon and Petroleum Chemistry (ACS). Presently, he is the Editor-in-Chief of *Applied Catalysis A:* General is a peer-reviewed scientific journal covering catalytic science and its applications published by Elsevier.

2020 Henry H. Storch Awardee (National): Dr. Saiful Islam

Dr. Saiful Islam is a Professor of Materials Chemistry at the University of Bath, UK. He grew up in London and obtained his Chemistry degree and Ph.D. from University College London (with Richard Catlow, Fellow of the Royal Society, FRS); this was followed by a Postdoctoral Fellowship at the Eastman Kodak Labs in Rochester, New York, the USA working on oxide superconductors. He returned to the UK to the University of Surrey, before joining the University of Bath in 2006.

His current research interests encompass computational studies of fundamental atomistic processes in the new electrode and solid electrolyte materials for lithium- and sodium-ion batteries, and perovskite materials for solar cells. He has more than 220



publications (h=73) and presented around 85 invited conference talks. A Fellow of the Royal



Society of Chemistry (FRSC), he has received several awards including the 2017 RSC *Peter Day* Award in Materials Chemistry and the 2013 Royal Society Wolfson Research Merit Award.

Saiful presented the 2016 Royal Institution Christmas Lectures for BBC TV on the theme of energy. He is a Patron of Humanists UK, and when not exploring energy materials, he enjoys family breaks (as a dad of two), indie music, films, and the chemicals gin and tonic.

R. A. Glenn Awardee for Best Paper in an ENFL Symposium: Dr. Estrella Rogel



Dr. Estrella Rogel received her doctoral degree in Chemistry in 1998 from Simón Bolívar University, Caracas, Venezuela. She has extensive experience in designing and conducting applied and basic research projects for the petroleum industry. She joined Chevron Energy Technology Co. in 2007. Nowadays, she occupies the position of Consulting Scientist.

Her research interests are focused on petroleum characterization, wax and asphaltene behavior and the understanding of deposition and fouling in refinery facilities.

Dr. Rogel has more than seventy publications in refereed scientific journals, seven book chapters, and fifteen patents/patent applications.

R. A. Glenn Awardee for Best Paper in an ENFL Symposium: Dr. Yunlong Zhang

Dr. Yunlong Zhang joined ExxonMobil Research Engineering Company as a staff scientist in 2014 after obtaining a Ph.D. in Physical Organic Chemistry from The Ohio State University in 2010 and completing a postdoctoral fellowship at the Massachusetts Institute of Technology.

His research in hydrocarbon science and petroleum chemistry focuses on upgrading heavy oils and asphaltenes, and synthesis of carbonaceous materials, with emphasis on a theoretical understanding of reaction mechanisms and structures at the molecular level. He is currently applying molecular imaging noncontact Atomic Force Microscopy to study molecular structure



and chemical reactivities of heavy petroleum molecules. His research has led to over 75 publications, conference presentations and invited keynote lectures, patents, a book chapter, and a book (as co-editor). He has served on the committees of ACS Energy and Fuels Division (ENFL) and Tri-state Chinese American Chemical Society (CACS) and organized many symposia. He is also currently serving as the chair of a technical committee to organize the 21st International Conference of Petroleum Phase Behavior and Fouling (PetroPhase 2020) in Jersey City.



2020 ENFL Distinguished Researcher Award in Petroleum Chemistry: Dr. James F. Brazdil



Dr. James F. Brazdil most recently holds the position of Group Research Director, Process Chemistry and Catalysis with Archer Daniels Midland Company (ADM) in Decatur, Illinois. He is responsible for the leadership of ADM's research programs in catalysis, chemical processes, and enzyme chemistry. This includes the direction of internal and external laboratory programs in the renewables and sustainable materials field. In this role, he has directed research programs in new process and catalyst development, high throughput catalyst screening, and technology demonstration through the pilot phase and commercial scale-up. Dr. Brazdil previously held the position of Research and Development (R&D) Manager and Head of Nitriles Catalyst R&D with *INEOS* and its predecessor company, BP (British Petroleum) Petrochemicals, in Naperville, Illinois. In that role, he was responsible for all the catalyst development efforts for the

acrylonitrile business and was tasked to support the business in maintaining its worldwide leadership position in catalyst technology, manufacturing, and sales. He and his R&D team were responsible for commercializing several new generations of novel and proprietary catalysts that currently provide best-in-class performance and operation in the acrylonitrile production industry worldwide. Dr. Brazdil began his career in catalysis research with SOHIO (Standard Oil of Ohio) where he conducted both fundamental and applied research in the areas of hydrocarbon ammoxidation and oxidation catalysis, surface spectroscopy, solid-state chemistry, and inorganic synthesis. He has contributed to the fundamental understanding of selective heterogeneous catalytic oxidation and ammoxidation, including insights into commercial catalyst design strategies, through numerous publications over the past 40 years in peer review journals, invited review articles, book chapters, and lectures. He is an inventor on 98 US patents along with their numerous global equivalents and has several other pending U.S. patent applications in the field of ammoxidation catalysis and bio-based chemical processes.

Dr. Brazdil has received several awards for his technical and leadership accomplishments including the 1989 Technical Achievement Award of the Cleveland Technical Societies Council, the 1990 Pittsburgh-Cleveland Catalysis Society Award in *Catalysis*, The Catalysis Society of Metropolitan New York 2001 Excellence in Catalysis Award, and the 2002 *Herman Pines* Award in Catalysis from the Catalysis Club of Chicago. He was selected as an American Chemical Society Fellow in 2014. He is a member of the American Chemical Society since 1975 and has held numerous leadership positions including secretary, treasurer, and chairman of the Petroleum Division (now the Energy and Fuels Division), and secretary, treasurer, and chairman of the Cleveland Section. He has also served as secretary, treasurer, and chairman of the Pittsburgh-Cleveland Catalysis Society, served on the Editorial Board of *Applied Catalysis* and as Director of the Catalysis Club of Chicago.



Spring 2020 Newsletter Call for Nominations

- ACS Henry H. Storch Award: This award is given annually to an individual who has made
 an outstanding contribution or contributions to fundamental or engineering energy
 related research & development and education that address the world's energy and
 chemical challenges. Areas of interest include hydrocarbon fuels, energy storage,
 renewable energy sources, and production of energy via such methods as fuel cells and
 solar photovoltaics. 2021 Deadline November 1, 2020
- **ENFL Distinguished Researcher Award:** This award is given annually for excellence in basic or applied research in broadly defined area of petroleum chemistry, as evidenced by publications or patents, invention or commercialization of new technologies, and leadership in the research area. 2021 Deadline September 15, 2020
- **ENFL Emerging Researcher Award:** This award recognizes sustained and distinguished contributions to the field of fuel chemistry recognizes for scientists who are early or midway into their careers, and normally with no more than 15 years after his/her last degree. The award is based both on the research record and service to the division/profession of the nominee. 2020 Deadline May 1, 2020
- ENFL and Energy & Fuels Joint Award for Excellence in Publication: This award is a
 collaboration between ENFL and the ACS journal Energy & Fuels, to recognize a notable
 article that has been published in Energy & Fuels during the previous 5 years (Dec 2016Dec 2021). 2021 Deadline December 15, 2020

New ENFL 2020 Officers

2020 ENFL Division Chair: Dr. Jingbo Louise Liu



Dr. Jingbo (Louise) Liu received her Ph.D. in Materials Science and Engineering from the University of Science and Technology Beijing in 2001. She is a Full Professor at Texas A&M University-Kingsville (TAMUK) and focused on materials preparation, characterization, and applications. She is the Chattered Chemist, Chartered Scientist and Fellow of Royal Society of Chemistry and DEBI faculty fellow at the US Air Force Research Laboratory. She has authored and co-authored, books, book chapters, and peer-reviewed journal articles (>115). During her services in TAMUK, she taught >10,700 students and

trained ~200 students and scholars to conduct leading-edge research. She directed and/or participated in the projects (>40) supported by the NSF (US and China), NSERC (CANADA), American Chemical Society (ACS) Petroleum Research Funds, and Department of Education as PI, Co-PI and senior personnel. She serves as alternative councilor of South Texas Chapter and Secretary/Historian of Texas A&M University Chapter, Sigma Xi, the Scientific Research Honor Society.

Her research interests are nanostructured materials preparation, characterization, understanding of their fundamental physical and chemical properties, and applications of engineered nanomaterials in alternative energy and biological science. She established the highest power density to advance the performance of proton exchange membrane fuel cells (2009) and directed a new paradigm to apply metal-organic frameworks in disinfection science.



2021 Division Chair-Elect: Dr. Alan Chaffee



Dr. Alan Chaffee works in the School of Chemistry at Monash University as a Professor. Before becoming an academic, he worked for a number of years in Australia's national research laboratory (CSIRO) and in private industry (BHP). His group undertakes applied chemistry research on topics that are related to biomass and fossil fuel utilization. For example, new approaches to the preparation of industrial chemicals, specialty liquid fuels, road bitumen, coke for steel making, carbon fibers and specialist (monolithic) high surface area active carbons are being developed that utilize low cost precursors and minimize energy losses (and, hence, CO₂ emissions). The group also investigates the capture of CO₂ emissions by adsorption and,

once captured, its transformation back into useful products by heterogeneous catalysis. In doing so, innovative new materials such as mesoporous silica, metal-organic frameworks (MOFs) and ionic liquids (ILs) are employed as adsorbents, catalysts and/or solvents. These novel materials are often sourced from other research groups within the School. Molecular modeling tools are also frequently applied, so that experiment and theory inform each other. In addition to journal contributions, he holds a number of patents and, with his team, is endeavoring to commercialize some of these opportunities.

2020 ENFL Program Chair: Dr. Asanga B Padmaperuma



Dr. Asanga Padmaperuma completed his B.Sc. in Chemistry at the University of Colombo (Sri Lanka) and obtained his Ph.D. in Organic Polymer Chemistry at the University of Southern California's Loker Hydrocarbon Research Institute. He is a named inventor on several granted patents as well as an author of more than 50 journal articles, book chapters, and public technical reports. He is a Senior Research Chemist in the Energy Processes and

Materials Division at Pacific Northwest National Laboratory. He serves as the Laboratory Relationship Manager for the Department of Energy's Bioenergy Technologies Office, which has oversight of research in the sustainable use of marine, terrestrial, and waste biomass for fuels and chemicals via thermal, biological, and electrocatalytic conversion. He also serves as the Technical Leader for the Chemical Conversion team in PNNL's Chemical and Biological Processing Group. Prior to his current assignment, his research focus was on thermochemical, low-temperature catalytic, and electrochemical production of value-added chemicals and fuels from bio-based and waste sources. He also conducted research on the design and development of functional molecules for organic electronics and liquid scintillators for radiation detection.



2021 ENFL Program Chairs



Dr. Yuyan Shao is a Senior Scientist and Team Lead for Fundamental Battery Research at the US Department of Energy (DOE) Pacific Northwest National Laboratory (PNNL). He received his B.S. (2001) and Ph.D. (2006) in Applied Chemistry from Harbin Institute of Technology. His research focus has been on fundamental materials chemistry, electrochemical energy materials, and devices, including fuel cells, batteries, hydrogen production. He has authored some 150 scientific papers (H-Index=60). He is also an inventor of about 50 patents/patent applications. He has been selected as Thomson Reuters/Clarivate Analytics "Highly Cited Researcher" (2014, 2017-2019). He has served

as a Guest Editor for the journals Advanced Materials (Special Issue: Materials Electrochemistry for Chemical Transformation - 2019) and Nano Energy (Special Issue: Electrocatalysis - 2016).



Dr. Jun Lu is a Chemist at Argonne National Laboratory. His research interests focus on the electrochemical energy storage and conversion technology, with focus on beyond Li-ion battery technology. Dr. Lu earned his bachelor's degree in chemistry physics from University of Science and Technology of China (USTC) in 2000. He completed his Ph.D. from the Department of Metallurgical Engineering at University of Utah in 2009 with a major research on metal hydrides for reversible hydrogen storage application. He is the awardee of the first DOE-EERE postdoctoral fellow under Vehicles Technology Program from 2011-2013. He serves as the associate editor of ACS Applied Materials and Interfaces. He was elected as associate president and board committee member of the

International Academy of Electrochemical Energy Science (IAOEES). He is also the first awardee of IAOEES Award for Research Excellence in Electrochemistry Energy in 2016. Dr. Lu has authored/co-authored more than 300 peer-reviewed research articles, including Nature; Nature Energy, Nature Nanotechnology; Chem. Rev.; Nature Commun.; JACS; and has filed over 20 patents and patent applications.

Volunteer opportunities

ENFL is looking for volunteers to help with Division activities and business. These will only take 5-10 hours/month and will provide leadership and functional skills as well as excellent networking opportunities with Division leaders and members. We particularly need help with the following but also have opening on all committees. Email us at enfldivision@gmail.com to engage.

- Area Representatives
 - Canada
 - O SE Asia
 - O Pacific Rim
- Communications & Technology Committee



Spring 2020 Newsletter Memorial



Dr. Henrik Topsøe (1944-2019)

[Adapted from Advances in Catalysis, Volume 65, 2019, Pages xiii-xx by Chunshan Song]

It was with great sadness, that we learned of Dr. Henrik Topsøe's passing on Friday, August 9, 2019, just 1 day before his 75th birthday. His passing is a massive loss to his family, friends, colleagues, and the global catalysis community. Dr. Henrik Topsøe was an outstanding scientist, internationally recognized for his research on catalysis at Haldor Topsøe A/S in Denmark. He was also a member of the Advisory Board for Advances in Catalysis.

Henrik was born on August 10, 1944, the son of Inger and Haldor Topsøe. He became a Chemical Engineer from Danish Engineering Academy in 1967, received his Ph.D. in 1972 and further conducted a postdoctoral research in catalysis from 1972 to 1973 with Professor Michel Boudart at Stanford University in the United States.

In 1974, he joined the company Haldor Topsøe A/S, which was founded by his father, Haldor Topsøe, in 1940. He worked for over 45 years in the company and made important contributions to both the fundamental catalysis research and catalyst business in the company. When his father Haldor Topsøe passed away in 2013, Henrik assumed the post of Chairman of the company's board of directors, which he held until 2016. He decided to resign from the chairman position in 2016 because of his cancer but he stayed on as a member of the board's Innovation Committee newly established in 2016.

During his career, Henrik served on the board of directors of the University of Copenhagen as well as in several scientific organizations, and in 2015 he became Knight of Dannebrog. He was a member of several scientific associations such as the Chemical Society, the Danish Physical Society, the Engineers' Association, the American Institute of Chemical Engineers, the American Association for the Advancement of Science, and the American Chemical Society. He was elected a Foreign Associate in the National Academy of Engineering in the United States. He was awarded the Division of Petroleum Chemistry Distinguished Award in 2010.



Spring 2020 Newsletter ACS DIVISION OF ENERGY & FUELS 2020 OFFICERS

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