May 2015 Highlights

ORNL Fuels, Engines, and Emissions Research Center

TECHNICAL HIGHLIGHTS

International Arctic Black Carbon (BC) Workshop Organized by Fuels, Engines, and Emissions Research Center (FEERC) Team in Milan, Italy

John Storey of FEERC organized an international workshop on Arctic BC in Milan, Italy. The workshop was held over two days immediately following the annual Task Force on Emissions Inventories and Projections (TFEIP) Workshop, and brought together more than 80 atmospheric pollution experts. Represented countries included the U.S., Canada, Europe, Eastern Europe and Central Asia (EECA), and the Russian Federation. BC, which originates almost exclusively from combustion, acts as a powerful short term climate forcer and can enhance snow and ice melting in the Arctic. BC Measurement and modeling methodologies, results of studies, and policy papers were presented at the Workshop. Of particular note was a first-of-its-kind presentation by the Russians describing BC pollution from ships in the Arctic Ocean.

Fueleconomy.gov Website Receives Significant Press

A CBS News story (reporter J. Edgerton) covered many of the fuel saving tips found on the "Driving More Efficiently," "Keeping Your Vehicle in Shape," and "Fuel Economy in Hot Weather" webpages on the fueleconomy.gov website. The site is maintained by the Oak Ridge National Laboratory (ORNL) and FEERC staff make regular technical contributions to the driving tips pages. Also the Detroit Free Press (M. Phelan) covered tips from the Fuel Economy in Hot Weather page. Numerous other media outlets, both web-based and print (including the local Knoxville newspaper), picked up the CBS and DFP stories. Staff member Shean Huff was interviewed and quoted about sensible use of the air-conditioner versus rolling down windows by Talk Radio 1190, Dallas News Talk. The dialog was also posted on the radio station's website.

ORNL Researcher Played a Key Role in Organizing a Top-Tier International Conference on Tribology

ORNL researcher Jun Qu served on the steering committee and as the poster chair for the 20th International Conference on Wear of Materials (WOM) in Toronto, Canada, April 12–16, 2015. WOM is a top-tier international conference on tribology and focuses on both the fundamental and applied aspects of tribology at the macro-, micro-, and nano-scale. It addresses the understanding of tribological phenomena; particularly the progress in recent decades and a special session will concentrate on modeling of wear. Organized every two years, WOM provides a unique international forum for researchers and practicing engineers from different disciplines to interact and exchange their latest results. In addition to serving on the organizing board, Jun also presented two technical papers at the conference, which are to be published in the next issue of the journal *WEAR*.

HIGH-LEVEL OR NOTEWORTHY VISITS

Contact

Robert M. Wagner, Ph.D.
Director, FEERC
Oak Ridge National Laboratory
865.946.1239
wagnerrm@ornl.gov

feerc.ornl.gov

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INVITED TALKS AND PRESENTATIONS

FEERC Deputy Director Invited to Hudson Institute Panel Discussion
Brian West delivered an invited presentation about High-Octane Ethanol Blends at a "Fueling the Future" conference at the Hudson Institute in Washington, D.C. Brian was on a panel with Reuben Sarkar, Deputy Assistant Secretary for Transportation at the Department of Energy (DOE), and Coleman Jones, Biofuels Implementation Manager at General Motors. Reuben described the Optima Initiative, an effort focused on co-optimization of fuels and engines planned to begin in FY2016, which aims to develop new fuels for new engines, with a parallel high-octane spark-ignition path and advanced compression ignition path. Coleman described the "regulatory incumbency" of traditional gasoline and diesel fuel and urged that researchers not underestimate the difficulty of overcoming this challenge. Brian described the benefits of high-octane fuel (HOF) in promoting improved vehicle efficiency, in particular HOF made with ethanol, one of the paths to be further explored in the Optima Initiative.

FEERC Staff Member Speaks at Chicago American Institute for Chemical Engineers (AIChE) Meeting
Jim Szybist delivered an invited presentation at a meeting of the Chicago chapter of the AIChE on May 12 entitled "Opportunities for Improved Efficiency in Spark Ignited Engines." In this well-received presentation, Jim presented an overview of fundamental engine thermodynamics and efficiency and showed how these were linked to several of ORNL's on-going state-of-the-art research projects.

ORNL Researcher gave Invited Presentation at Association for Unmanned Vehicle Systems International (AUVSI) Unmanned Systems 2015
ORNL research staff member Mike Kass gave an invited presentation at the Unmanned Systems 2015 Expo and Conference in Atlanta on May 4. Unmanned Systems is the annual meeting for the AUVSI and is the largest international gathering (over 8000 attendees from over 55 countries) devoted to unmanned vehicles, especially unmanned aerial systems. Dr. Kass' presentation was entitled "Summary of Small UAS Propulsion Needs and Opportunities" presented during the technical track session on Energy, Power, and Propulsion for UAS. This event was the first time that UAS propulsion was included as a session topic. Propulsion and power are gaining more attention from the UAS community as the needs for improved engine durability and efficiency are driving new advances and technologies for these systems.

ORNL Researcher gave Invited Presentation at the 2015 Society of Tribologists and Lubrication (STLE) Annual Meeting
Jun Qu gave an invited talk, "Low-Viscosity Lubricants Using Ionic Liquids as Base Stocks or Additives," at the Symposium on Molecular Chemistry and Lubricant Rheology, STLE 70th Annual Meeting in Dallas, May 17–21. This presentation was an overview of ORNL's decade-long research and development (R&D) on ionic liquids lubrication and provided insights of future direction for this research topic. The presentation was well received and led to follow-on discussions with multiple companies for potential collaborations including Valvoline/Ashland, Afton, Vanderbilt Chemicals, BASF, GS Caltex, etc.

AWARDS

Scott Curran receives the Society of Automotive Engineers (SAE) Foundation 2015 Stefan Pischinger Young Industry Leadership Award
Scott Curran of FEERC was presented with the 2015 Stefan Pischinger Young Industry Leadership Award at the 2015 SAE Foundation Annual Celebration in Detroit. This award highlights early career individuals who demonstrate leadership potential and promote science, technology, engineering, and mathematics (STEM)-based researched in their respective fields. The SAE Foundation is the charitable branch of the SAE International professional society.

OUTREACH

ORNL-Mentored High School Student Wins Chemistry Division in Recent Southern Appalachian Science and Engineering Fair, Places Third Overall
Oak Ridge High School (ORHS) student, Thomas Colburn, won the Chemistry Division at the recent Southern Appalachian Science and Engineering Fair (SASEF), and placed third overall with his project "Enhanced Decomposition of Household Plastics through Photocatalysis." Todd Toops of ORNL's FEERC served as his mentor and helped him perform his research throughout the school year at the National Transportation Research Center (NTRC)-2. Colburn also won four special awards

during the competition from the American Chemical Society, Leidos Corporation, American Institute of Chemical Engineers, and an opportunity to compete to travel to Arizona State's sustainability initiatives conference. The project will also be submitted to the Stockholm Junior Water Prize and the Google Science Fair.