Green Chemistry and Engineering 101 Workshop - November 3, 2015

greenUp

University of Michigan
North Campus Research Complex,
Ann Arbor, Michigan

PRELIMINARY AGENDA

1:00 pm	**Registration**
1:30 pm	**Welcome and Opening Remarks**
1:45 pm	**Principles of Green Chemistry and Engineering: Application of these Principles into Research, Teaching and Industry** - *Sudhakar Reddy, University of Michigan* Green Chemistry and Engineering, simply, is the design of Eco-friendly chemical and engineering processes that reduce or eliminate the use and generation of hazardous materials. The growing need for greener, more sustainable technologies leading economic development opened up opportunities to explore new methodologies in industry, public organizations and higher educational institutions. Basic principles of Green Chemistry and Engineering will be outlined. Examples of Green Chemistry and Engineering principles and their applications in the teaching and research laboratories will be discussed. Some award winning examples from the Presidential Green Chemistry Challenge Awards Program will be presented.
2:00 pm	**New Product Development and Green Chemistry** - *Clinton Boyd, Steelcase Inc.* *Design for Environment* (DfE) – the recognition that the environmental impacts of a product over its entire life cycle is largely determined at the *design phase* - is a key concept for product stewardship and sustainability. *Green Chemistry* is essentially the application of DfE at the molecular level; a central statement is that negative impacts on human health and the environment should be viewed as a design flaw. When viewed through the lens of design, Green Chemistry offers the opportunity to identify new design principles and strategies to both promote new innovations and reduce negative impacts of chemicals and materials on human health and the environmental. To fully realize the benefits, green chemistry should thus be integrated into the material innovation & exploration stage of new product development.
2:30 pm	**BREAK**
2:45 pm	**Driving Innovation though Life Cycle Thinking** - *Rich Helling, Dow Chemical Company* The concept of sustainability is critical for businesses and individuals to understand and apply. Although there are many ways to define sustainability, at Dow we say that sustainability requires making every decision with the future in mind. Sustainable innovation is driven by a clear corporate strategy, global accountability to goals, and a variety of tools that enable business performance. The ability to articulate aspirational goals for some areas and quantitative measurements for others is critical. Dow's "Sustainable Chemistry Index" and life cycle assessment (LCA) practices are instrumental in positioning sustainability as a target for innovation – and a source of business growth. These and other tools, their application and their impact will be described.
3:15 pm	**Alternative Assessments and the GreenScreen® for Safer Chemicals** - *Nancy Linde, NSF International* Learn how companies are moving towards safer chemistry with a tiered approach. This session will include a short presentation of the GreenScreen method, related tools, and best practices for supply chain disclosures, followed by a group discussion on how to choose a safer alternative.
4:15 pm	**Interactive session**
5:00 pm	**ADJOURN**

GREEN CHEMISTRY AND ENGINEERING 101 WORKSHOP
SPEAKER BIOGRAPHIES

Dr. Sudhakar Reddy obtained his Ph.D. in Analytical Chemistry in 1980 from National Chemical Lab, India and came to this country as a NASA Post-doctoral Fellow. After holding various positions in private companies he joined the University of Michigan in 1994. Dr. Reddy has developed many green methods in analytical chemistry to measure target chemicals. Based on a green method developed by Dr. Reddy's group, Dionex has re-designed their Accelerated Solvent Extractor to measure PCBs in air. As the Sustainability Coordinator he has developed several programs to benefit the University of Michigan community. Sustainable Lab Certification Program is one among them that received great attention across the campus and also in the state of Michigan. He received Governor Award in 2013, I2SL Go Beyond award in 2014. S-Lab recognized him with an award this year at their annual conference in Leeds, UK. His passion is to green the lab operations through sustainability and behavioral change. Dr. Reddy is currently sitting on many professional and charitable boards and committees including Michigan Green Chemistry Round Table. He has published about 30 papers and delivered many invited lectures on varied topics related to Lab Safety and Sustainability.

Clinton S. Boyd, PhD is the *Principal-Green Chemistry & Sustainability* for the Global Sustainability Initiatives team at Steelcase Inc. Clinton works specifically on material and chemistry aspects of products across their life cycle, including materials innovation and exploration, product development & launch, and regulatory compliance. Drawing on his expertise in green chemistry, industrial ecology and sustainability, Dr. Boyd works with cross-functional teams to innovate new materials and products that are sustainable and compliant to regulations on a global platform. Dr. Boyd has a PhD in Biochemistry from Rhodes University, South Africa. Before joining Steelcase, Clinton worked in academia as a research biochemist followed by ten years of experience as a consultant on green chemistry and sustainability.

Dr. Rich Helling is Director of Sustainable Chemistry for The Dow Chemical Company, located in Midland, Michigan. Rich advises Dow businesses on the use of LCA and related tools to identify opportunities for innovation, differentiate products in the marketplace and create sustainable value for Dow. Rich has been with Dow for 28 years, in a variety of technical and managerial roles in R&D, Manufacturing and Sustainability, and has been based in Michigan, California and France. Rich holds a bachelors' degree from Harvey Mudd College with majors in Engineering and History, a masters' degree in Chemical Engineering Practice from MIT, and a doctorate in Chemical Engineering, also from MIT. He is a LCA Certified Professional.

Nancy Linde is a toxicologist with 17 years of experience in chemical based hazard and risk assessment. Her current title is Managing Toxicologist for the Green Chemistry and Sustainability Programs at NSF International in Ann Arbor, Michigan. Nancy manages a team of toxicologists that perform hazard assessments for manufacturers seeking earn certification to NSF Sustainability standards and EPA's Safer Choice Program, and those using GreenScreen Benchmark scores, Health Product Declarations (HPDs), and other alternatives assessment paradigms to distinguish safer products. She has personally developed hazard and risk assessments for hundreds of organic and inorganic chemicals, including nanomaterials, for use in industrial cleaning products, personal care products, foods, drinking water treatment chemicals, paints, firefighting foams, deicers, lubricants and numerous consumer products. She has a keen interest in computational toxicology and modeling to fill data gaps. Nancy currently serves on the technical advisory committee for Clean Production Action's GreenScreen and the advisory board for the University of Toledo School of Green Chemistry and Engineering. She has conducted numerous trainings for the GreenScreen for Safer Chemicals™ program including the Introductory and Advanced Practitioner courses. She earned a Master of Science in environmental health from the University of Michigan in 1998, and is a member of the Society of Toxicology.