



**Advancing Renewable Fuel, Chemical, and Materials Technologies**

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**Abstract**

The development of commercially viable technologies to produce renewable alternatives to fossil-derived transportation fuels, chemicals and materials will diversify the economy, reduce society's carbon emissions, and extend the timeline for non-renewable fossil resources. In this talk the speaker will review some of the research and development areas conducted in the SUNRISE Research and Education Program that may contribute to this objective. These include: 1) the comprehensive development of technologies to convert fatty acid-based oils into transportation fuels, chemicals and carbon fibers, 2) reactions to convert sugars into higher value building block chemicals, and 3) technologies to overcome current barriers associated with the use of microalgae as a source of renewable oils and sugars.

**Bio**

Wayne Seames is a Chester Fritz Distinguished Professor of Chemical at the University of North Dakota (UND), USA. An Arizona, Seames received his BS in Chemical Engineering at the University of Arizona, USA in 1979. After a 16 year Industrial career as a Process Engineer, Supervisor, and Project Manager, he returned to Arizona and earned his Doctorate in Chemical Engineering in July, 2000.

Professor Seames is an internationally recognized expert in renewable energy/chemicals technologies and in the environmental impacts of coal utilization. He is the Director of the Sustainable Energy Research Initiative and Supporting Education Program (SUNRISE), a multi-university, multi-disciplinary research and outreach center. He is a named inventor on eight UND U.S. patents and has received over \$21 million in research funding during his 19 year academic career. He was inducted into the National Academy of Inventors in April, 2017. He was also the 2014/15 Fulbright Distinguished Chair and a Visiting Professor at the University of Leeds, UK.

Dr. Seames is also an accomplished Engineering Educator. His first textbook, "Designing Controls for the Process Industries" was published by CRC Press/Taylor & Francis this September. He has delivered over a dozen active teaching workshops over the past four years, helping over 260 academic instructors to acquire the skills and knowledge they need to advance student learning in engineering and the sciences. A book chapter related to this material was published by Elsevier in 2018.

Among his academic awards are: the 2018 UND Foundation/Lydia and Arthur Saiki Faculty Award for Individual Excellence in Teaching, the 2013 UND Faculty Scholar Award for Excellence in Scholarship, Teaching, and Service (the University's Professor of the Year award); the 2012 UND Award for Interdisciplinary Collaboration in Research or Creative Work; the 2012 UND Faculty Spirit of Achievement Award; the 2011 UND Chester Fritz Distinguished Professor for sustained excellence as a tenured faculty member (UND's highest faculty award); the 2007 UND Foundation/Thomas Clifford Faculty Achievement Award for Individual Excellence in Research; the 2006 "Professor of the Year" award from UND School of Engineering and Mines; the 2004 UND School of Engineering and Mines Olson Professorship for Outstanding Individual Accomplishments in Research; and the 1999 "Award for Excellence at the Student Interface", University of Arizona College of Engineering and Mines, (Professor of the Year) recognizing his teaching and advising contributions to the Chemical Engineering Department.

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