

Department of Chemistry Public Lecture

Bayer Lectureship in Sustainability

7 p.m. Tuesday, April 22, 100 Bell Museum

Renewable Plastics: Step One in Breaking Our Oil Addiction

Our challenge: Producing synthetic plastics from renewable resources.

*Professor George Huber, a leading scientist in the field of bioenergy,
examines this challenge at a Bayer Lectureship in Sustainability:*

7 p.m. Tuesday, April 22, Bell Museum Auditorium. Free and open to the public*.

With the advent of synthetic polymers (plastics), the field of materials was revolutionized. The challenge of the 20th century was how to tune the polymer properties and create new types of plastics that could be used in a wide range of applications. A challenge for the 21st century is how to sustainably produce synthetic plastics from renewable resources. Renewable plastics can be produced from abundant feedstocks that include carbon dioxide, carbohydrates, and waste/non-edible biomass. Moreover, life cycle assessments have shown that these renewable polymers reduce greenhouse gas emissions and displace petroleum. In this presentation, we will discuss the growth and the market drivers for the renewable plastics industry, and some of the current market successes and products that are near commercialization. Additionally, we will also discuss new technologies being developed in the Huber research group to make renewable polymer precursors from biomass through catalytic processes. To accomplish this, we use a wide range of modern chemical engineering tools to design and optimize these clean technologies including: heterogeneous catalysis, kinetic modeling, reaction engineering, spectroscopy, analytical chemistry, nanotechnology, catalyst synthesis, conceptual process design, and theoretical chemistry. By relying on very similar technologies that are used in the petrochemical industry, renewable plant biomass can be converted into liquid transportation fuels or renewable plastics. However, plastics are a higher value product and the first step in reducing our society's dependence on imported foreign oil.

George W. Huber is a professor of chemical and biological engineering at University of Wisconsin-Madison. He leads a research group focused on developing new processes for the production of renewable liquid fuels and chemicals (www.biofuels.che.wisc.edu).

He has written numerous peer-reviewed publications and patents. *Biofuels Digest* named him one of the top 100 people in bioenergy. He is one of the most highly cited young scholars in the chemical sciences. He is co-founder of Anellotech, a biochemical company focused on commercializing catalytic fast pyrolysis—a technology to produce renewable aromatics, polymer precursors from biomass. He serves on the editorial board of *Energy and Environmental Science*, *ChemCatChem*, and *The Catalyst Review*. He has received several awards, including the National Science Foundation CAREER award and the Dreyfus Teacher-Scholar award. Huber earned his doctorate in chemical engineering from the University of Wisconsin-Madison, and his master's and bachelor's degrees from Brigham Young University. He completed a post-doctoral appointment with the Technical Chemical Institute at the Polytechnical University of Valencia, Spain.



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Hosted by Chemistry Professor Marc Hillmyer,
director of the National Science Foundation Center for Sustainable Polymers.
Bell Museum of Natural History, 10 Church St. S.E., Minneapolis