School of Materials Science and Engineering

Seminar Topic:
Emerging Guidelines for the Design of Organic Semiconductors

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Abstract

This presentation will initially focus on the impact of molecular structure on the organizational and functional properties of organic semiconductors. Special emphasis will be placed on understanding organizational principles under kinetically confined conditions as a result of non-covalent interactions; for instance, the diversity of conformational isomers, presence of solvent additives, and molecular reorganizations that may favor amorphous or crystalline phases. Examples will be provided that illustrate translation of morphological control into more efficient optoelectronic devices, including organic solar cells.

The second part of the seminar will center on the properties of narrow bandgap conjugated polyelectrolytes, and in particular how the electrostatic field of the adjacent charged groups can be used to modulate doping preferences of the electronically delocalized backbone. New emerging applications for these materials will be demonstrated, including the ability to dope other semiconductors, including carbon nanotubes and graphene, and to serve as relays for electron transport from living anaerobic microorganisms.

Biography

Professor Guillermo (Gui) Bazan received his B.Sc. (summa cum laude) from the University of Ottawa. His Ph.D. studies were carried out at the Massachusetts Institute of Technology under the guidance of Nobel Laureate Richard R. Schrock. He was a postdoctoral associate at the California Institute of Technology with Professor John E. Bercaw.

Professor Bazan began his independent academic career at the University of Rochester in 1992. He was recruited by the University of California, Santa Barbara in 1998, and currently holds appointments in the Departments of Materials and in Chemistry & Biochemistry. Relevant awards and recognitions include: Thomson Reuter “Most Influential Scientific Minds”, 2015; Fellow of the Royal Society of Chemistry, 2014; Top 50 Material Scientists by Citation and Impact, Thompson Reuters, 2011; Macromolecules Advisory Board, 2009; Professor of the Chang Jiang Scholars Professor, 2009; Advanced Materials Editorial Advisory Board, 2008; Fellow of the American Association for the Advancement of Science, 2007; American Chemical Society Cope Scholar Award, 2006; Bessel Award, Humboldt Foundation, 2005; NSF Special Creativity Award, 2003; Union Carbide Innovation Award, 1999; Union Carbide Innovation Award, 1998; Closs Lecturer, University of Chicago, 1997; Camille and Henry Dreyfus Teacher-Scholar Award, 1996-1998; Sloan Research Fellow Award, 1996-1998; NSF CAREER Award, 1995-1998; Dreyfus New Faculty Award, 1992-1993; NSERCC Postdoctoral Fellowship, November 1990-May 1992 and the NSERCC 1967 Science and Engineering Scholarship, September 1986-June 1990.

Three spin-off companies are associated with his laboratories and the students in his group. They include Sirigen (purchased by Becton Dickinson), NEXT Energy, and Apeel Technologies. Prof. Bazan holds approximately thirty patents. Thirty of his previous students and postdoctoral associates now lead successful academic positions.

Tuesday, 6 March 2018 || Time: 1:30 pm – 2:30 pm ||
Venue: MSE E-Studio (N4.1-B2-02)
Hosted by: Professor Chen Xiaodong