

- CALL FOR PAPERS AND POSTERS - 12th Institute of Biological Engineering Meeting 2007 Annual Meeting of IBE



March 30 - April 1, 2007 in *St. Louis, Missouri*

About IBE

IBE was established in 1995 to promote broad inquiry in the fundamentals of engineering sciences based on biology and to examine these at all scale levels - from molecular to organism to landscape scales. It encourages inquiry, application and interest in biological engineering in the broadest and most liberal manner and promotes the professional development of its members.

IBE is striving to form a nexus of engineers and scientists, professional societies, and industries to inspire designs that capture remarkable features of living systems. IBE is bringing Engineering to Life through **Biology-Inspired™ Engineering**.

Who Should Attend

Engineers and scientists interested in creating new knowledge that provides greater understanding of engineering principles founded from the understanding of biology and that promote advances in design to capture remarkable features of living systems.

Special Features in 2007

Participation by scientists and engineers from multiple disciplines working at the interfaces and presenting on advanced topics in Biology-Inspired Engineering, a Bio-Business Nexus for industry to highlight new products and a short-course on the utilization of biomass for bioenergy and bioproducts.

Students Competition for students in engineering and science for cash awards in the Student Poster Competition and in the Bioethics Essay Competition. Additional information for both competitions can be found at www.ibeweb.org.

Special event opportunities will include industrial and sightseeing tours.

-Dr. Czarena Crofcheck
Chair, Program Committee

Session Topics for 2007:

Synthetic Biology

Contact: Jay Keasling, keasling@berkeley.edu & Tom Richard, trichard@psu.edu

Biology-Inspired™ Nanotechnology

Contact: Jeff Catchmark, JCatchmark@enr.psu.edu

Biology-Inspired™ Materials

Contact: Mark Haidekker, HaidekkerM@missouri.edu

Biology-Inspired™ Computation

Contact: Vijay Narayanan, vijay@cse.psu.edu

Biology-Inspired™ Modeling

Contact: Timothy S. Gardner, tgardner@bu.edu

Biology-Inspired™ Imaging

Contact: Mark Haidekker, HaidekkerM@missouri.edu

Biology-Inspired™ Sensors

Contact: Marshall Porterfield, porterf@purdue.edu

Biology-Inspired™ Tissue and Cellular Engineering

Contact: Agnes Ostafin, aostafin@nd.edu

Membrane Biophysics and Cellular Mechanics

Contact: James Lee, leejam@missouri.edu & Jin-Yu Shao, shao@biomed.wustl.edu

Reverse Engineering of Lignocellulosic Recalcitrance

Contact: Tom Richard, trichard@psu.edu

Engineering Biorefineries as Industrial Ecosystems

Contact: Robert P. Anex, rpanex@iastate.edu

Biofuels and Bioproducts

Contact: Sandun Fernando, sf99@abe.msstate.edu

Bioprocessing & Natural Products

Contact: Michael Montross, montross@bae.uky.edu

Separations of Bioproducts

Contact: Zivko L. Nikolov, znikolov@tamu.edu

Engineering Ecology

Contact: Marty Matlock, mmatlock@uark.edu & David Gattie, dgattie@enr.uga.edu

Innovative Paradigms in Biological Engineering

Education Contact: Jenna Rickus, rickus@ecn.purdue.edu

Biological Engineering Design

Contact: Czarena Crofcheck, ccrofche@bae.uky.edu

Bioethics

Contact: Jerry Gilbert, jgilbert@provost.msstate.edu & Praveen Kolar, pkolar@uga.edu

Biological Engineering Poster Session & Student Competition

Contact: Charles Kinoshita, kinoshi@wiliki.eng.hawaii.edu

Submit abstract through IBE Website

www.ibeweb.org

Abstract are due

December 1, 2006

The Institute of Biological Engineering, 3650 Annapolis Lane North, Suite 107, Minneapolis, MN 55447-5434

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2007 Session Details:

Synthetic Biology (Podium) This session will focus on recent advances in the design and construction of new and modified biological parts, devices, and systems for useful purposes. *Session organizer: Jay Keasling, keasling@berkeley.edu, Univ. California, Berkeley*

Biology-Inspired™ Nanotechnology (Podium) This session will include papers on nanoscale devices, methods, and approaches which have been inspired and derived from recent developments in our understanding of biology at smaller scales. *Session organizer: Jeff Catchmark, JCatchmark@engr.psu.edu, Penn. State Univ.*

Biology-Inspired Materials (Podium) This session will focus on the development of technologies that utilize biological materials or biological functions as a design element. Papers describing the use of these technologies in nanotechnology, medicine, agriculture, sensors, chemical processing, and other engineering and science problems are invited. *Session organizer: Mark Haidekker, HaidekkerM@missouri.edu, Univ. Missouri-Columbia.*

Biology-Inspired Computation (Podium) This session will include papers that address biological computing approaches that investigate the principles of computation found in biological systems, such as DNA computing, self-assembly of nanostructures, and bioinformatics. *Session organizer: Vijay Narayanan, vijay@cse.psu.edu, Penn State Univ.*

Biology-Inspired Modeling (Podium) This session will include papers that address biological modeling approaches that quantitatively characterize structure/function relationships in biological molecules and biological networks of molecules and populations, such as metabolic modeling, quantitative biology modeling, quantitative genomics, and proteomics. *Session organizer: Timothy S. Gardner, tgardner@bu.edu, Boston Univ.*

Biology-Inspired Imaging (Podium) Bioimaging is a process allowing one to obtain an object's structure or composition in a spatially resolved representation or picture, prominently used for medical diagnosis. The session on biologically inspired imaging will include papers on all aspects from advances in conventional clinical modalities over new technologies, such as optical tomography, to advanced imaging applications in the biomedical, bioenvironmental, and bioprocessing areas. *Session organizer: Mark Haidekker, HaidekkerM@missouri.edu, Univ. Missouri-Columbia.*

Biology-Inspired™ Sensors (Podium) This session will address the development and application of a broad range biological sensor technology for applications relating to agriculture, biological sciences, the environment, and medicine. *Session organizer: Marshall Porterfield, porterf@purdue.edu, Purdue Univ.*

Biology-Inspired™ Tissue and Cellular Engineering (Podium) Papers are invited on applications of engineering principles to the study and utilization of cellular systems spanning from genetic and molecular to tissue constructs. Example topics include gene and drug delivery, cell-substrate interactions, tissue engineering and biomaterials, and cell-based biosensors. *Session organizer: Agnes Ostafin, aostafin@nd.edu, Notre Dame Univ.*

Membrane Biophysics and Cellular Mechanics (Podium) This session will focus on the applications of engineering principles, including experimental and computational techniques and theories to studies of the role of membrane biophysics and cellular mechanics in biological functions, diseases, and bioprocesses. *Session organizer: James Lee, leejam@missouri.edu, Univ. Missouri-Columbia and Jin-Yu Shao, shao@biomed.wustl.edu, Washington University, St. Louis.*

Reverse Engineering of Lignocellulosic Recalcitrance (Podium) This session will focus on innovative pretreatment strategies for biomass conversion to chemicals and fuels, as well as fundamental advances in knowledge about the molecular nature of lignocellulosic recalcitrance. Of particular interest are novel uses of natural and synthetic biocatalysts to probe and deconstruct plant cell walls. *Session organizer: Tom Richard, trichard@psu.edu, Penn State Univ.*

Engineering Biorefineries as Industrial Ecosystems (Podium) Industrial ecosystems are engineered as technological “food webs” that facilitate recycling materials and the cascading of energy for increased resource use efficiency. Biorefineries are being designed as industrial ecosystems that interface with and become extensions of the natural ecosystem. Papers are invited on biorefinery design and integration with industrial and/or natural processes, loop-closing and recycling, energy integration, and nutrient cycling. *Session Organizer: Robert P. Anex, rpanex@iastate.edu, Iowa State University.*

Biofuels and Bioproducts (Podium) This session will address the processing of biobased raw materials for industrial and food applications and renewable energy production from biomass. *Session organizer: Sandun Fernando, sf99@abe.msstate.edu, Mississippi State Univ.*

Bioprocessing & Natural Products (Podium) Papers are invited on fermentation products and natural products used as pharmaceuticals, agrochemicals, additives, and biomaterials. *Session Organizer: Michael Montross, montross@bae.uky.edu, Univ. of Kentucky*

Separations of Bioproducts (Podium) This session is intended to share developments in separation technologies currently practiced or potential applicable to a variety of biological systems. Focus of the session will be on downstream processing of natural and transgenic tissues/fluids/extracts and products derived from plant or animal systems. Presentations describing basic and applied research in membrane filtration, chromatography, liquid-liquid or solid-liquid extraction, precipitation, crystallization, etc. are encouraged. *Session organizer: Zivko L. Nikolov, znikolov@tamu.edu, Texas A & M Univ.*

Engineering Ecology (Podium) This session will focus on advances in theory and principles from the fields of General Systems Science, Systems Ecology and Engineering as they apply to making complex, holistic systems tractable study units of nature. The session will include presentations on quantitative systems ecology, mathematical biology/ecology, network analysis, quantitative methods for analyzing and understanding ecological and biological complexity, integrated design methods at the nexus of ecology and engineering, landscape-level development strategies and related topics. *Session Organizer: Marty Matlock, mmatlock@uark.edu Univ. of Arkansas and David Gattie, dgattie@engr.uga.edu, Univ. of Georgia*

Innovative Paradigms in Biological Engineering Education (Podium) This session will present new and well developed methods in education of biological engineers with perspectives from teaching engineering to education of biological scientists and biological educators. *Session organizer: Jenna Rickus, rickus@ecn.purdue.edu, Purdue Univ.*

Biological Engineering Design (Podium) Participants in this session will present current research and case studies about design methodologies, optimization techniques and design validation for engineering problems in biological and ecological engineering. *Session Organizer: Czarena Crofcheck, ccrofche@bae.uky.edu, Univ. of Kentucky*

Bioethics (Podium) This session will feature the results of a student competition and selected presentations on bioethics as it relates to biological engineering topics. Check the IBE website (www.ibeweb.org) for information on the Bioethics Competition for students. *Session organizers: Jerry Gilbert, jgilbert@provost.msstate.edu Miss. State Univ. and Praveen Kolar, pkolar@uga.edu, Univ. Georgia*

Biological Engineering (Poster) Poster presentations covering any topic within biological engineering are invited. A special poster session for student research projects or engineering design projects will be included within the poster session. The top three Undergraduate Student Posters and top three Graduate Student Posters will receive cash awards and certificates of merit. Additional information about the Student Poster Competition can be found at www.ibeweb.org. *Session organizer: Charles Kinoshita, kinoshi@williki.eng.hawaii.edu, Univ. of Hawaii*