

The Department of
Mechanical Engineering
PRESENTS

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WCH Room 205/206
11:10-12:00PM

Light Transfer in Photobioreactors for CO₂ Capture and Biofuel Production

Abstract:

Industrial and developing nations face the formidable challenge to meet ever expanding energy needs without further impacting climate and the environment. These conditions call for much greater reliance on a combination of fossil fuel-free energy sources and on new technologies for capturing and converting CO₂.

This seminar will present how photosynthetic microalgae and cyanobacteria, grown in photobioreactors, can be used to mitigate CO₂ emissions and produce biofuels and other added-value products in a sustainable manner. It will emphasize the importance of light transfer in designing and controlling the photobiological process. It will also present experimental measurements of the spectral absorption and scattering cross-sections and scattering phase function of selected microalgae in the visible part of the electromagnetic spectrum. The seminar will also discuss experimental demonstrations on control incident light intensity and spectra to maximize microalgae CO₂ capture and biomass production in benchtop photobioreactors. Finally, it will propose design rules for scaling up the technology to efficient industrial-scale outdoor photobioreactors

About the Speaker:

Laurent Pilon received his PhD in Mechanical Engineering from Purdue University in 2002. He then joined the Mechanical and Aerospace Engineering Department at UCLA where he is now Full Professor. His research group is engaged in a wide range of interdisciplinary research projects at the intersection between interfacial and transport phenomena, material science, and biology for sustainable energy conversion, storage, and efficiency technologies. He is the recipient of the U.S. National Science Foundation CAREER Award, the 2008 Bergles-Rohsenow Young Investigator Award in Heat Transfer from the American Society of Mechanical Engineers, and the 2009 Young Scientist Award in Radiative Transfer from the Journal of Quantitative Spectroscopy and Radiative Transfer. He was elected Senior Member of SPIE in 2011. He also received several teaching awards from UCLA.