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RENEWABLE AND SUSTAINABLE ENERGY INSTITUTE

BIG energy seminar series

Addressing global energy challenges in scale and complexity.

Energy and Charge-Transfer in Molecular Materials: The Role of Quantum Coherence

Dr. Obadiah Reid

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University of Colorado -Boulder

Date: Tuesday, May 1 at 12:30pm

Location: ECEE 1B32

Abstract:

Molecular semiconductors possess unique features that make them useful for a wide range of applications: energy harvesting, light emission, lasing, sensing, and bioelectronics, to name a few. However, because of their "soft" character, they also present unique challenges to the engineer that are rooted in difficult scientific questions. In this talk, I focus on the energy and charge-transfer processes crucial to the function of both molecular solar cells and natural photosynthesis. I will present evidence for the role that quantum phenomena play in enabling the unexpected efficiency of molecular solar cells, and show how classical energy transfer can be harnessed to rationally design better photovoltaic devices. Finally, I suggest ways coherent energy transfer might be used to simplify optimal light harvesting structures.

Bio:

Dr. Reid has spent his career to-date studying photovoltaic energy conversion in molecular materials and developing instrumentation for this purpose. He obtained a PhD in Chemistry from the University of Washington in 2010, followed by a three-year postdoctoral appointment at the National Renewable Energy Laboratory. He is currently an Assistant Research Professor in the Renewable and Sustainable Energy Institute, University of Colorado Boulder.

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