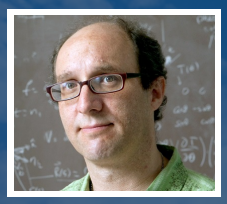
Harnessing Efficient Solar Cells with Quantum Mechanics



Eric Bittner
John and Rebecca Moores Professor, Chemistry

CURRENT RESEARCH

Exploring quantum coherence in condensed state systems

If it could be properly harnessed, there's enough sunlight that falls on the earth in just one hour to meet the world's energy demands for a whole year! Therefore, our whole energy problem could be solved if we could somehow find a way to harness solar energy more efficiently. Dr. Eric Bittner, of the University of Houston, is motivated by the dream that all households will one day have affordable solar power that they can use to power their devices. Dr. Bittner's research works to find these microscopic fundamental interactions in order to create new light-weight and highly efficient solar cells which will greatly impact our energy source and technologies. Moreover, his research can help experimentalists understand theoretically the ways that quantum phenomena play important roles in very diverse systems with the utmost precision. His research ties state-of-the-art theory to state-of-the-art laser experiments on state-of-the-art devices.

Dr. Bittner's belief is that by understanding how molecules work at the level of quantum mechanics, scientists can understand and possibly manipulate how molecular-scale properties are manifest in larger-scale systems. If scientists understand the microscopic fundamental interactions between mixed polymers, they can learn how that influences the ultimate behavior and therefore craft innovative and powerful technologies. The details of his work involve coupling high-level quantum theory with novel approaches to treat the time-dependent many-body quantum dynamics of mesoscale systems. Through the collaboration of the top experimental groups in the world, including those at Cambridge University, Imperial College, London, Princeton, and the University of Montreal, he can connect...

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AFFILIATION

University of Houston

EDUCATION

- Ph.D., in Chemistry, 1994 , University of Chicago
- B.S., in Chemistry & Physics, 1988 , Valparaiso University

AWARDS

- Fulbright Scholar, Canada
- Visiting Scholar, Stanford University, 1996-1997
- NSF Postdoctoral Fellow, UT Austin, 1994-1996

RESEARCH AREAS

Environment, Clean Energy, Clean Energy, Space

FUNDING REQUEST

Your contributions will support the research of Dr. Eric Bittner as he continues to investigate ways to harness solar energy more efficiently. Your support will fund the necessary costs of Dr. Bittner's personnel that go on to careers in both industry and academia. Your donations will have a direct impact on creating solar powered renewable energy sources!