CORE-CM SEMINAR
Michigan State University

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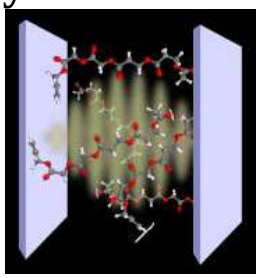
University of California at San Diego

Chemistry and physics of molecules in cavities



Organic molecules interact strongly with confined electromagnetic fields in plasmonic arrays or optical microcavities owing to their bright transition dipole moments. This interaction gives rise to molecular polaritons, hybrid light-matter quasiparticles. Molecular polaritonics opens new room-temperature opportunities for the nontrivial control of physico-chemical properties of molecular assemblies [1]. In this talk, I'll showcase some of these opportunities that we have been theoretically (and, together with our experimental collaborators) exploring in the past few years. I will discuss the relevant time and energy scales associated with molecular polaritons [1,2] and strategies to exploit them to control photoexcited processes including singlet fission [3], triplet harvesting, and long-range energy transfer [4], and anomalous nonlinear optical effects [5,6]. I'll conclude by highlighting some exotic possibilities of harnessing polaritons to recreate topologically protected excitations [7,8] or even carry out remote control of chemical reactions.

REFERENCES

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[2] L. A. Martínez-Martínez, R. F. Ribeiro, J. A. Campos-González-Angulo, and J. Yuen-Zhou, Can ultrastrong coupling change ground-state chemical reactions?, ACS Photonics 5, 167 (2018).
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Thursday, September 20, 2018
12:00 NOON
Room 1400 – Biomedical & Physical Sciences
Professor Ben Levine - Host