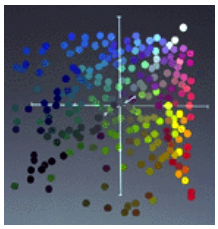

The Rowland Institute at Harvard

Prof. Ted Sargent
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Nanoscale design of materials for the capture and storage of renewable energy

Abstract: Tremendous progress in the cost-effective conversion of solar and wind energy into electrical power brings about a new challenge: the massive (seasonal-scale) storage of energy. We focus on using computational materials science, spectroscopies including ultrafast and synchrotron, and advances in materials chemistry, to create new catalysts for CO2 reduction and oxygen evolution. I will discuss recent advances including a new high-activity OER catalyst [1] and a low-overpotential CO2 reduction catalyst based on field-induced reagent concentration [2]. I will also touch on related materials design problems in optoelectronics, including the design of composite organic-inorganic materials for photon-to-electron [3, 4] and electron-to-photon [5, 6] conversion.

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[3] C. R. Kagan, Efrat Lifshitz, E. H. Sargent, D. V. Talapin, "Building devices from colloidal quantum dots," Science, 10.1126/science.aac5523, 2016.
[4] Hairen Tan, … E. H. Sargent, "Efficient and stable solution-processed planar perovskite solar cells via contact passivation," 10.1126/science.aai9081, 2017.
[5] Z. Ning, … E. H. Sargent, "Quantum-dot-in-perovskite solids," Nature, doi:10.1038/nature14563, 2015.
[6] V. Adinolfi, E. H. Sargent, "Photovoltage field-effect transistors," Nature, DOI:10.1038/nature21050, Feb 2017

Wednesday, March 22, 2016 at 4:00 PM
Auditorium, First Floor

Host: Haotian Wang