

SEMINAR

Research Talks from the Resnick Fellows



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Nanophotonic Platforms for Light Harvesting

In this talk I will give an overview of our recent studies of light-material interaction in nanoscale photonic systems. Specifically, I will discuss 1) scenarios for enhancing nonlinear quantum light emission for prospective sources of entangled light and 2) near-unity light absorption in metallic and semiconductor nanostructures for photovoltaic and photoelectrochemistry applications.

Ultrathin van der Waals Photovoltaics

The isolation of stable atomically thin two-dimensional (2D) materials on arbitrary substrates has led to a revolution in solid state physics and semiconductor device research over the past decade. While, graphene is the poster child of the 2D materials family, a variety of other 2D materials (including semiconductors) with varying structures and opto-electronic properties have been isolated over the last few years raising the prospects for a new class of devices assembled by van der Waals forces. A fundamental challenge in using 2D materials for opto-electronic devices is enhancing their interaction with light, ultimately responsible for higher performance and efficiency in the devices.

In this seminar, I will show our recent work on photovoltaic devices from transition metal dichalcogenides of molybdenum and tungsten (MoS_2 , WSe_2 etc.). We have recently demonstrated significant developments in both light-absorption and charge collection. I will also present the scope for future work using just monolayers of materials to engineer near unity light absorption and collection.

3:00 to 4:00 pm | Wednesday, 12/7/16
Guggenheim 101, Lees-Kubota Lecture Hall
Caltech Campus | resnick.caltech.edu

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