SEMINAR

Research Talks from the Resnick Fellows

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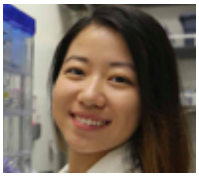

Jinglin Huang

Resnick Grad Research Fellow

Carbon Nanotubes for Seawater Desalination Applications

A vertically aligned carbon nanotube (CNT) is an open tip single hollow structure with the appearance of a latticework fence. It has fantastic salt and pollutant repellency, as well as antifouling and self-cleaning features. When immersed in water, its superhydrophobic surface can be used to induce an air layer between the solid surface and water, which is helpful in facilitating an anti-scale formation process. However, the air layer on the superhydrophobic surface can be quickly swept away by the fast-moving flow as the forces on the protruding bubble overwhelm the surface tension forces holding the bubble to the wall. This talk will cover: 1) CNT as a superior material due to its salt-repellent property, 2) the potential of using a simple electrolysis setup to reasonably restore the air layer. Overall, we hope to show the potential of using CNTs for building corrosion-resistant surfaces in the solar desalination channel.

Carlos Read

Resnick Postdoctoral Scholar

Growth and Characterization of Single-Crystalline Photocatalytic Materials for the Production of Solar Fuels

A complete photoelectrochemical device (PEC) requires many components, all working together at optimal efficiencies for prolonged periods of time. Unfortunately, the stability and efficiency of many of the available materials is less than desired, especially under the extreme alkaline or acidic environments required for a commercially viable PEC solar fuels platform. Recent reports have identified transition metal oxynitrides as one of the few classes of semiconductor materials capable of direct water splitting under visible-light irradiation. However, poor materials quality, low performances (<1%) and modest stabilities have hindered their in-depth study. Here, we present our recent work on the development of new synthetic methods for the production of high-quality single-crystals of a series of perovskite-type oxynitrides. These approaches will allow for careful examination of the semiconductor-catalyst interface and the effects that various integration strategies and surface protection layers might have on the electronic band structure, efficiency, and stability of these systems.

11:00 am - NOON | Thursday, NOV. 2, 2017

Guggenheim 133 Lees-Kubota Lecture Hall

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