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SEMINAR

Ted Sargent PhD

Optoelectronic Devices Based on Colloidal Quantum Dot Solids

Solution-processed photovoltaics offer a cost-effective path to harvesting the abundant resource that is solar energy. The organic and polymer semiconductors at the heart of these devices generally absorb visible light; however, half of the Sun's power reaching the Earth's surface lies in the infrared.

Flexible solar cells that harvest wavelengths beyond 1 μm were first reported in 2005, and were based on the application of quantum-size-effect-tuned infrared-bandgap colloidal quantum dots. Since then, we have reported certified solar power conversion efficiencies exceeding 7%. Recent advances of interest include all-quantum-tuned tandem solar cells; and the emergence of all-inorganic colloidal quantum dot materials that use halide anions, instead of conventional organic ligands, for passivation.

I will summarize advances in the materials chemistry, fabrication, physical understanding, and performance-oriented engineering of colloidal quantum dot solar cells and light sensors.

Biography

Ted Sargent holds the Canada Research Chair in Nanotechnology at the University of Toronto, where he also serves as Vice Dean for Research for the Faculty of Applied Science and Engineering. He is Fellow of the AAAS "...for distinguished contributions to the development of solar cells and light sensors based on solution-processed semiconductors" and is Fellow of the IEEE "... for contributions to colloidal quantum dot optoelectronic devices." He is a KAUST Investigator; and is CTO of InVisage Technologies of Menlo Park, CA.

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Thursday, JAN. 17, 2013 • 3PM to 4PM
101 Guggenheim • Lees-Kubota Lecture Hall
Refreshments Before Seminar at 2:45PM