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## **Seminar**

# **Strategies to Boost Efficiencies of Quantum Dot Solar Cells**

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The most abundant source of renewable energy is the sun, which can be converted directly to useful forms of energy such as electricity by photovoltaics. One device structure that has attracted much recent interest is that of the quantum dot solar cell, which has the potential for achieving low cost, high efficiency conversion of solar energy to electricity. However, quantum dot solar cells are currently limited by the recombination of excited electrons and holes inside the solar cell resulting in low fill factors and photovoltages.

In the first half of my talk, I will be discussing a strategy to boost photovoltaic performances of quantum dot solar cells by doping  $Mn^{2+}$  into the quantum dots, which helps in reducing recombination due to long lived spin and orbital forbidden d-d transitions in  $Mn^{2+}$ . In the second part, I will explain how band engineering of quantum dots can be employed to enhance the directionality and charge carrier collection and overall photovoltaic performances of these types of devices.

***Thursday, Sep 25th 2014***

***11:30 AM (Tea/Coffee at 11:15 AM)***

***Seminar Hall, TCIS***