



*NEW YORK CITY COLLEGE OF TECHNOLOGY*  
**Physics Department**  
**Seminar in Physics**

# **High Efficiency Quantum-well Quantum-dot Solar Cells**

*Presented by:*

*Dr. Sheng-kun Zhang*

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## **Abstract**

A new approach has been proposed to produce high efficiency semiconductor solar cells. The materials used for the cells are lattice-matched ZnCdSe quantum wells, CdSe quantum dots and InAs quantum dots. By changing the width of quantum wells and the size of quantum dots, the effective bandgaps of the absorbers can be adjusted. Taking advantage of the multiple bandgaps of these materials, the energy conversion efficiency will be greatly elevated since the combination of these materials can absorb sunlight from the whole solar spectrum. The coupling between the quantum wells and quantum dots will provide an efficient way to transport photogenerated carriers thus enhance power of these solar cells. These solar cells will be ideal power source in space due to their high efficiency and long lifetime.