



Graduate Physics Seminar  
Monday, 16 April 2012 from 4 PM  
University of Nova Gorica  
Vipavska 13, Rozna dolina, Nova Gorica  
SP-1 Lecture room

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## **Solar photovoltaics in Malawi**

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### **Quantum dot solar cells**

#### **Abstract**

All solar photovoltaic systems in Malawi are stand-alone systems, because electrification rate of Malawi is 7%. There are three types of solar photovoltaic systems installed, namely solar lighting, solar refrigerators and solar water pumps. These solar photovoltaic systems are indispensable in health facilities located in rural areas without electricity, and should be upgraded by newly introduced technology in the near future.

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Silicon solar cells are the current mainstream with theoretical upper limit for the conversion efficiency of light into electricity of about 30%. By using the quantum dots solar cells, theoretically, 75% conversion efficiency can be achieved. Quantum dots solar cells introduce intermediate bands in the normal semiconductor band gap. These intermediate bands increase the number of electrons in the conduction band, so that more electricity can be retrieved.