Making use of the educational potential of nanoscale energy production and conservation

George L. Linnion

Howard College
University of Petroleum Matthew SBURC

Crystalline Silicon Solar Cells

Advantages:
- Raw material is abundant, durable, environmentally benign
- 22% efficiency (incoming light to electricity)

Disadvantages:
- Producing high purity silicon is expensive
- Low absorptivity (100 μm thick is heavy and rigid)
- High demand for computer chips raises price ($100/kg)
- $3-$5/ watt

Mars Sojourner Rover

Solar Cells

Solar Cell Efficiency

Ga_xAl_yGa_zP/GaAs/Ge Solar Cell

Culn_xGa_1-xSe_2 Solar Cells

Culn_xGa_1-xSe_2 Solar Cells

TiO_2 Dye Solar Cell

TiO_2 Dye Solar Cell

TiO_2 Dye Solar Cell

CdSe Emission and Absorption

Quantum Dot Solar Cells

Multiple Exciton Generation

Organic Solar Cells

Organic Solar Cells

Thermoelectric Coolers

Thermoelectric Module

Thermoelectric Module

Pellicier/Seebeck Effect

Energy Harvesting

Purifying Silicon

GaN, GaP, GaAs/Ge Solar Cell

NANOSOLAR CELL FACTOR SANJOSE, CA

POWERHOUSE

The future of mobile energy by organic solar panels

Energy Harvesting

Solar Panel

Thermal Energy

Wind Energy

Bio Energy