

CRSP 2009 Shared Research Thrust Areas

(Examples listed under each of the five areas are illustrative only.)

Photoconversion into Electricity

1. Inorganic Materials and Novel Device Architectures for Advanced Solar Cells
Thin-film Si, new low-cost Si substrates, nanocrystalline semiconductors, CdTe and CIGS solar cells, new polycrystalline thin films, new transparent conductors, new multijunction and other novel device concepts, plasmonics.
2. Novel Organic/Polymeric/Hybrid Inorganic-Organic Solar Cells
Molecular semiconductor and polymeric solar cells, nanocrystalline dye-sensitized solar cells.
3. Third-Generation PV
Quantum-confined structures for solar cells (quantum dots, quantum films/wells, quantum wires/rods) intermediate-band solar cells, up- and down-conversion of incident photons, thermophotonics.

Photoconversion into Fuels

4. New Materials and Approaches for Efficient Solar Water Splitting
Bioinspired materials, novel thermal chemical processes (lower temperature; less corrosive chemicals), novel photoelectrochemical processes (coupling light harvesting with efficient catalysts; improved water oxidation component durability).
5. Photoreduction of CO₂ with Water to Fuel (artificial photosynthesis)
New catalysts for CO₂ reduction and water oxidation based on abundant elements, increased catalyst durability, light-harvesting units with catalytic site, biological assemblies; system integration and analysis.