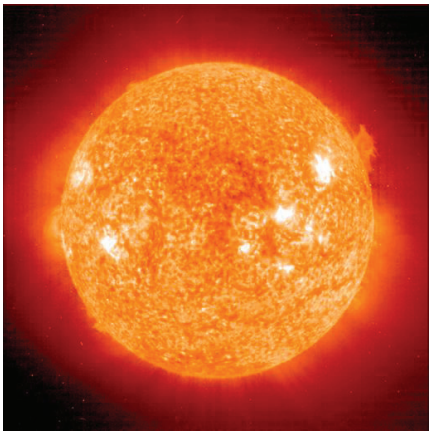
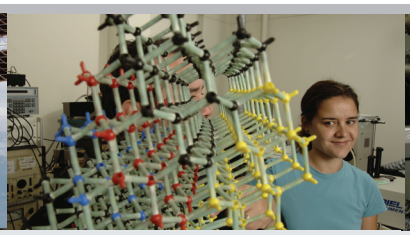
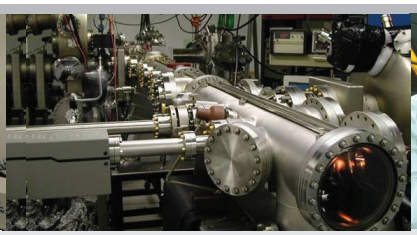
Ohio State Advanced Photovoltaics Group



The "Ohio State Advanced Photovoltaics Group" consists of collaborative faculty members performing research in virtually all areas of photovoltaics technology and basic science. With backgrounds that span disciplines including Electrical Engineering, Chemistry, Materials Science, Mechanical Engineering and Physics, this group is engaged in both exploratory and near-term solar photovoltaics research from spectrum-optimized approaches based on metamorphic III-V concepts, to hybrid organics and polymers, dye-sensitized approaches and application of tailored molecular design. The group is committed to interdisciplinary collaboration to explore basic science leading to translational advances in photovoltaics technology. The group is a core component of the state-funded, $18.6 million Wright Center for Photovoltaics Innovation and Commercialization (PVIC), which enables collaboration with the solar industry at both large-scale and start-up levels.


Recent Highlights

- First GaInP/GaAs/SiGe cells for space power and terrestrial concentrators
- New metallo-organic polymer shown to enhance solar photon harvesting
- First Zn_2Sn0_4-based dye-sensitized solar cells
- GaAs/SiGe cells tested on the International Space Station
- High efficiency P3HT : PCBM OPVs with oxidized Ag nanoparticles
- Created controlled oxide nanostructures for hybrid PV
- Correlated nanoscale interface diffusion and thin film CIGS cell performance
- First high performance GaAsP/Si solar cells by defect engineering

Selected Photovoltaics Facilities

- III-V MOCVD system for solar cell R&D
- III-V MBE systems for solar cell R&D
- Time resolved photoluminescence and fast spectroscopy labs
- High resolution x-ray diffraction
- Electronic transport characterization
- Electron microscopy and related methods
- Complete cell fabrication process line from materials to prototype assembly
- Light and dark I-V testing
- Deep level spectroscopy laboratories
- Close spectrum matched AM0 and AM1.5 solar simulator
- Spectral response testing
- Rooftop testbed

Ohio State Advanced Photovoltaics Researchers

Paul Berger, Electrical & Computer Engineering, berger.143@osu.edu
Advancing organic photovoltaic materials, processing, devices and hermetic sealing; plasmonics to extend spectral harvesting and the incorporation of new materials for tandem cells

Leonard Brillson, Electrical & Computer Engineering, brillson.1@osu.edu
CIGS heterostructures for terrestrial and space photovoltaics; nanoscale electronic, chemical, and structural characterization and correlation with full device solar cell performance metrics

John Carlin, Institute for Materials Research, carlin.9@osu.edu
III-V multi-junctions; heterogeneous integration and metamorphic designs; MOCVD growth and processing; material and device metrology

Malcolm Chisholm, Chemistry, chisholm.4@osu.edu
Design and synthesis of new metallo-organic polymeric materials for photon harvesting to improve polymer-based solar cell efficiency

Robert J. Davis, Institute for Materials Research and Nanotech West Laboratory, davis.2316@osu.edu
III-V and silicon device fabrication for photovoltaics, electronic and optical materials, advanced fabrication, metrology

Arthur Epstein, Physics, epstein.2@osu.edu
Synthesis and properties of organic compounds for photovoltaic applications

Terry Gustafson, Chemistry, gustafson.5@osu.edu
Optical characterization of photovoltaic materials

Joseph P. Heremans, Mechanical Engineering, heremans.1@osu.edu
High-efficiency bulk thermoelectric semiconductors for direct solar heat to electrical power conversion; resonant acceptors and donors; thermal conductivity minimization by anharmonic phonon scattering

Roberto C. Myers, Materials Science & Engineering, myers.1079@osu.edu
Molecular beam epitaxy growth of III-Nitride hetero-and nanostructures for photovoltaics; UV-Vis-NIR optical spectroscopy and recombination dynamics in solar cell materials

Nitin Padture, Materials Science & Engineering, padture.1@osu.edu
Nanostructured oxides in the form of nanocrystals, nanotubes, nanowires, and thin films, for low-cost photovoltaics

Siddharth Rajan, Electrical & Computer Engineering, rajan.21@osu.edu
III-Nitride based photovoltaics, integration of III-Nitrides on Si substrates, III-N/III-As multijunction photovoltaics

Steven A. Ringel, Electrical & Computer Engineering and Institute for Materials Research, ringel.5@osu.edu
III-V compound photovoltaics, terrestrial and aerospace applications, III-V/Si and heterogeneous integration; metamorphic multijunctions; defect engineering; radiation effects; characterization and simulation

Yiying Wu, Chemistry, wu.531@osu.edu
Dye-sensitized solar cells; synthesis of new oxide nanomaterials; photoelectrochemistry of complex oxides

Wright Center for Photovoltaics Innovation and Commercialization (PVIC)

PVIC was established in early 2007 through an $18.6 million award from the Ohio Department of Development, along with matching contributions of $30 million from universities, federal agencies, and industrial collaborators. PVIC is a scientific partnership of the University of Toledo, Bowling Green State University, and The Ohio State University. PVIC's goal is to accelerate the photovoltaic (PV) industry in Ohio by reducing solar costs, improving technologies, and transferring these new techniques from the laboratory to the production line. IMR Associate Director Dr. Robert J. Davis serves as the Principal Investigator of the OSU PVIC site. For more information, visit the website of the Wright Center for Photovoltaics Innovation and Commercialization (PVIC): http://pvic.org/

The Institute for Materials Research (IMR) is the gateway to materials-allied research at The Ohio State University. For more information on photovoltaics and all other materials research activities at The Ohio State University, visit the IMR's website at imr.osu.edu or contact IMR Program Manager Layla Manganaro at manganaro.4@osu.edu or (614) 247-4685