

High Efficiency Solar Cells and Quantum Cascade Lasers Using III-V Semiconductors

Speaker: James Piao, Epitaxial Laboratory Inc.

Date: Tuesday, February 17

Time: 2:00PM-3:00PM

Place: Room 202 ECEC

Abstract: Advances in semiconductor materials enable new device technologies and improve the properties of existing technologies. In this talk, I will present efforts within my company on the growth of new materials and devices by molecular beam epitaxy and the resulting advances in solar cells, and optoelectronics. Specifically, I will discuss: (1) ultra-high efficiency multi-junction solar cells (2) Quantum cascade lasers in the missing wavelength band (3) New dilute thallium semiconductors in which thallium is incorporated into III-V materials to reduce the bandgap significantly, with unique temperature insensitive bandgap that cannot be easily achieved in other materials. In these new materials, electronic, thermal, and optical properties can be quite different from those of conventional materials, with significant promise for applications in a variety of (opto)electronic devices.

About the speaker:



Dr. James (Jie) Piao is president of Epitaxial laboratory, Inc. He received his Ph.D. in Applied Physics at Columbia University. He was the principle investigator on over 17 funded R&D contracts, and served as principle investigator on the multi-phase joint programs with US Army and managed and run the Army ARDEC MBE program for 8 years