

The University of New Mexico Student Chapter of the Optical Society of America presents

Semiconductor Lasers: From Homojunctions to Quantum Dots

Prof. Peter G. Eliseev

Center for High Technology Materials, University of New Mexico

Wednesday, November 17th, at 12:00 noon

Center for High Technology Materials, Room 101

A light lunch will be served starting at 11:45 am

A review is given on development of semiconductor lasers beginning from ideas and realization of first laser diodes to quantum-well and quantum-dot lasers. The progress in room-temperature threshold current density (improvement by 4-5 decades) is discussed. Role of electron and optical confinement is commented. A contemporary approach to the evolution of semiconductor laser devices is presented. Recent results on ultra-low current density laser structures on the base of quantum dots and quantum dashes are discussed. The energy spectra of QD ensembles are presented and analyzed from the point of view of influence of the confinement potential shape on the spectral peak positions. Data are given on anisotropy of quantum-dash structures, on gain cross-section and gain saturation in InAs/InGaAs quantum-dot lasers, on migration of carriers in structures with QDs. High overall efficiency of laser diodes (more than ~70%) is also discussed.

<http://www.unm.edu/osa>