



Next Generation Laser Diodes: Aluminum Free

If research at Northwestern University is successful, aluminum-free laser diodes may be on the shelves in the next several years. Manijeh Razeghi, director of Northwestern's Center for Quantum Devices, leads a team investigating InGaAsP/InGaP/GaAs double heterostructure laser diodes grown using metalorganic chemical vapor deposition (MOCVD).

This new generation of laser diodes emitting in the 0.8 μm region offers minimal facet damage and provides increased reliability because of the presence of quaternary materials. The Northwestern group has achieved nearly 70% efficiency of radiative recombination in the active region and threshold current densities approaching the theoretical limits for InGaAsP/InGaP/GaAs lasers. Razeghi's says her MOCVD fabrication technique produces diodes in two weeks.

Applications include 2- μm laser radar, pumping of solid state lasers, optical computing, and high-definition television. The work has been submitted to *Applied Physics Letters* and is supported by the Defense Department's Advanced Research Projects Agency.