

Abstract Submitted
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Observation of Optical Gain in InAs Nanocrystals GANG CHEN, RONEN RAPAPORT, DAN FUCHS, SAHAR VILAN, Bell Labs, Lucent Technologies, ASSAF AHARONI, URI BANIN, Hebrew University — We developed processes that enable the inclusion of InAs nanocrystals, emitting at 1.55 microns, into a transparent polymer matrix while preserving their optical properties. This provides a flexible platform for integrating the functionality of the nanocrystals into the current photonic circuit technologies. Using three-beam, time-resolved pump-probe measurements, we observed strong evidence of optical gain in a polymer film containing InAs nanocrystals for the first time. We measure the gain dynamics in that system, extracting the gain lifetime and the gain recovery time. These processes and measurements are the first step towards incorporating semiconductor nanocrystals into active devices, such as lasers and amplifiers, on an integrated photonic circuit.

Gang Chen
Bell Labs, Lucent Technologies

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