Special Issue

Optical Gain in Semiconductors

Message from the Guest Editor

Optical gain in semiconductors is the phenomenon that reveals light amplification in monolithic electron devices. Despite the apparent narrow linewidth of this, if compared with optical gain in arbitrary systems or with the general properties and performances of semiconductor materials and devices, it is vast indeed. Here, optical gain transforms from a physical phenomenon into a measurable key quantity for optoelectronic device engineering. Its balance with optical losses determines the capability of any light-emitting device becoming a laser. Terms such as threshold current, so crucial even in a technical datasheet of commercial laser diodes, are intimately linked to optical gain. Moreover, spatial gain modulation also allows for local optical confinement and waveguiding, another mandatory step in optoelectronic device technology. The pervasive employment of photonic and optoelectronic devices in ICT brought about mass production and the additional involvement of many different and complementary skills in the field of material science, optics, electronics, process engineering, reliability.

Guest Editor

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