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Autore	Kalt Heinz
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Altri autori (Persone)	KlingshirnClaus F
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Sommario/riassunto	This book provides an introduction to and an overview of the multifaceted area of dynamics and nonlinearities related to optical excitations in semiconductors. It is a revised and significantly extended edition of the well-established book by C. Klingshirn split into two volumes and restructured to make it more concise. Inserts on important experimental techniques, reference to topical research and

novel materials, as well as consideration of photonic applications support research-oriented teaching and learning. This book reviews nonlinear optical properties and many-body phenomena evoked by high densities of quasi-particles in semiconductors. Coherent dynamics and relaxation of optical excitations (carriers, excitons, electron–hole plasmas, etc.) as well as condensation phenomena are elucidated in these materials. A broad overview is provided of seminal research results augmented by detailed descriptions of the relevant experimental techniques, e.g., ultrafast spectroscopy, four-wave mixing, and the Hanbury-Brown and Twiss experiment. Offering a comprehensive introduction to hot topics in current research — polariton condensates, valley coherence, and single photons, to name a few, it also discusses applications of the described physical concepts in topical areas, such as quantum information, photonics, spintronics, and optoelectronics. Covering subjects ranging from physics to materials science and optoelectronics, the book provides a lively and comprehensive introduction to semiconductor optics beyond the linear regime, and with many problems, chapter introductions, schematic depictions of physical phenomena, as well as boxed inserts and a detailed index, it is suitable for use in graduate courses in physics and neighboring sciences like material science and optical communication. It is also a valuable reference resource for doctoral and advanced researchers.