

electron near the band edge can be proved, to all orders of the electron-electron interaction in a static lattice, to be a well-defined quasiparticle with a renormalized mass and a dielectric-screened interaction with other band-edge electrons and holes. Then, in chapters 3 and 6, the Hartree-Fock approximation for the electron is unnecessary; in that approximation, one must, ad hoc, add the dielectric screening to the exciton equation. That difficulty is avoidable, because the standard effective-mass equation for the exciton has been shown to be exact in the Wannier limit.

It would be churlish to dwell on the few flaws (or perhaps merely disagreements between us) in such a large undertaking. I mention them here only for consideration in the next edition. It may lead to errors to assign damping rates (for example, on page 90) without basing them on a microscopic theory. The recombination rate of electrons and holes would give the same decay rate for each species, but some mechanisms that affect the lifetime of only one species contribute to pure dephasing. The statement on page 110 that the semiclassical treatment of the electric field is valid when the field is quantized neglects the correlation between the field and the exciton. The current count in the photodetector, equation 4.79, should be either the electron or the hole contribution.

I believe (with perhaps the excessive fervor of a convert) that interdisciplinary knowledge in coherent optics, in strong-interaction physics, and in mesoscopic physics will play an expanding role in semiconductor and metal physics and thus help physicists to understand nanosystems that are far from equilibrium. The traditional semiconductor physics curriculum—electrons, phonons, transport, and a bit on optical properties (but not coherent dynamics)—is insufficient to prepare a student for the increasingly quantum world. I recommend Schäfer and Wegener's timely and pioneering text for a cohesive presentation of modern semiconductor physics.

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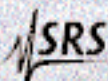
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