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charged exciton complexes trions in low dimensional structuresWhat is Excitons | Types of Excitons | Wannier-Mott | Frenkel Excitons in Hindi Kronig Penney Model Bands in Solids K P Model Controlling Coherent Light-Matter Interactions in Semiconductors | Hui Deng

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2018: Polaritons The Pursuit of Low dimensional Structures in High dimensional Data, Yi Ma , Microsoft Research, Asia Low Dimensional Semiconductor Devices| Lecture No 13.0| Quantum Well, Quantum Wire, Quantum Dots|| No. 8. Free electrons, effective masses in semiconductors, direct-gap absorption, excitons Introduction to electron-phonon interactions Philip Kim Materials in 2 dimension and beyond- platform for novel electronics and optoelectronics How Electron Delocalization Can Help to Turn Light into Electricity

Excitons In Low Dimensional Semiconductors

Low-dimensional semiconductors have become a vital part of today's semiconductor physics, and excitons in these systems are ideal objects that bring textbook quantum mechanics to life. Furthermore,...

Excitons in Low-Dimensional Semiconductors

Confinement of excitons in low-dimensional structures leads to a strong enhancement of excitonic effect. They have impact on optical properties of these structures up to room temperature even for materials with low excitonic binding in the bulk. We will start in this chapter with the properties of excitons in quasi-2D structures (quantum wells).

Excitons in Low-Dimensional Semiconductor Structures ...

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Excitons in Low-Dimensional Semiconductors: Theory ...

Information on the energy spectrum of excitons is obtained from low temperature photoluminescence excitation spectroscopy. The application of an external electric field tunes the energy of the excitons, and fine structure is observed as a result of the interaction of high-angular momentum states and the ground state of the first light-hole exciton.

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Excitons in Low-Dimensional Semiconductors: Theory ...

Low-dimensional semiconductors have become a vital part of today's semiconductor physics, and excitons in these systems are ideal objects that bring textbook quantum mechanics to life. Furthermore, their theoretical understanding is important for experiments and optoelectronic devices.

Excitons in Low-Dimensional Semiconductors - Theory ...

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Excitons in Low-Dimensional Semiconductors - Toc

Compared with the bulk counterparts, low-dimensional semiconductors possess notable Coulomb-interaction-mediated excitonic effects arising from the reduced dielectric screening. As a consequence, excitons or bound electron-hole pairs, together with charge carriers, serve as the primary photoinduced energetic species.

An Excitonic Perspective on Low-Dimensional Semiconductors ...

Excitonic properties of synthetic low-dimensional semiconductors based on Pbl units have been extensively studied, because excitons in these semiconductors have very large binding energy and various dimensions in the translational motion. The optical properties have been summarized by Ishihara in 1995 and by Papavassiliou in 1997.

Excitons in a single two-dimensional semiconductor crystal ...

phonons, and excitons, can be expected in low-dimensional semiconductors, which endow the systems with distinctive excited-state properties that are distinctly different from those in the bulk counterparts. Consequently, these interactions determine not only the mechanisms but also quantum yields of photosynthetic energy utilization.

Low-Dimensional Semiconductors in Artificial ...

Claudio Andreani L. (1995) Optical Transitions, Excitons, and Polaritons in Bulk and Low-Dimensional Semiconductor Structures. In: Burstein E., Weisbuch C. (eds) Confined Electrons and Photons. NATO ASI Series (Series B: Physics), vol 340.

Optical Transitions, Excitons, and Polaritons in Bulk and ...

Strongly-bound excitons and trions in anisotropic 2D semiconductors Sangho Yoon1,2†, Taeho Kim1,2†, Seung-Young Seo1,2, Seung-Hyun Shin3, Su-Beom Song1,2, B. J. Kim2,3, Kenji Watanabe4, Takashi Taniguchi5, Gil-Ho Lee3, Moon-Ho Jo1,2, Diana Y. Qiu6*, Jonghwan Kim1,2,3*

Strongly-bound excitons and trions in anisotropic 2D ...

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Excitons in Low-Dimensional Semiconductors: Theory ...

Multiple exciton generation (MEG) in low-dimensional semiconductors is the procedure by which multiple electron-hole pairs, or excitons, are created after the absorption of a single high-energy photon (larger than two times the bandgap energy) and is an encouraging research direction to maximize the solar energy conversion efficiencies in semiconductor solar cells at a possibly much diminished price [76, 77, 78].

Recent Advancement on the Excitonic and Biexcitonic ...

A significant feature of low dimensional electronic systems is the enhanced many body interactions due to reduced dimensions. 116 Many body scattering processes such as Auger recombination and exciton-exciton annihilation play a major role in non-radiative relaxation when the density of excitons is very high.

Physics of excitons and their transport in two dimensional ...

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Excitons in Low-Dimensional Semiconductors: Theory ...

As will become apparent, excitonic effects in low-dimensional semiconductors are hugely enhanced. The reason is that excitonic effects originate from the attractive interaction between electrons and holes. The stronger the attraction, the more pronounced the excitonic corrections to the response.

10. Excitons in Bulk and Two-dimensional Semiconductors

Some special features of polaritons, quasi-particles being normal modes of system of excitons interacting with photons in so called strong coupling regime, are theoretically and numerically analyze in low dimensional systems.

Exciton-polaritons in low dimensional structures ...

In low-dimensional structures, the binding energy increases owing to the localization of an electron and hole in one or several spatial directions and, correspondingly, to an increase in the Coulomb attraction of charge carriers [60, 61]. In the case of excitons in freely suspended crystalline monolayers, their binding energy can be even larger due to the absence of the electric field screening in a vacuum.