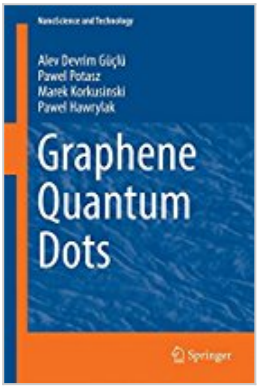




# Graphene Quantum Dots (NanoScience and Technology)

*By Alev Devrim Güçlü, Pawel Potasz, Marek Korkusinski, Pawel Hawrylak*



**Graphene Quantum Dots (NanoScience and Technology)** By Alev Devrim Güçlü, Pawel Potasz, Marek Korkusinski, Pawel Hawrylak

This book reflects the current status of theoretical and experimental research of graphene based nanostructures, in particular quantum dots, at a level accessible to young researchers, graduate students, experimentalists and theorists. It presents the current state of research of graphene quantum dots, a single or few monolayer thick islands of graphene. It introduces the reader to the electronic and optical properties of graphite, intercalated graphite and graphene, including Dirac fermions, Berry's phase associated with sublattices and valley degeneracy, covers single particle properties of graphene quantum dots, electron-electron interaction, magnetic properties and optical properties of gated graphene nanostructures. The electronic, optical and magnetic properties of the graphene quantum dots as a function of size, shape, type of edge and carrier density are considered. Special attention is paid to the understanding of edges and the emergence of edge states for zigzag edges. Atomistic tight binding and effective mass approaches to single particle calculations are performed. Furthermore, the theoretical and numerical treatment of electron-electron interactions at the mean-field, HF, DFT and configuration-interaction level is described in detail.

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## Editorial Review

From the Back Cover
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