Quantum dots, also called artificial atoms, are man-made nanostructures: they have many properties similar to an atom, such as addition energy, shell structure and spin configurations. Moreover, due to their experimental accessibility, quantum dots offer very rich physics which cannot be studied in real atoms. In this work, we investigate electronic and transport properties of planar quantum dots in magnetic fields by using and combining several quantum many-body techniques such as exact diagonalization, variational and diffusion Monte Carlo, Keldysh Green's function formalism, Hartree-Fock, and composite fermions.

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