

Energy Colloquium

Indirect Excitons: From the Physics of Cold Bosons to Devices and Back

Prof. Leonid Butov

University of California, San Diego

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Skolkovo Innovation Center

**Technopark, Building 3, Multifunctional Area,
3rd floor (Note unusual place)**



ABSTRACT:

An indirect exciton is a bound pair of an electron and a hole confined in spatially separated quantum wells. Due to their long lifetimes, indirect excitons can cool down below the temperature of quantum degeneracy. This gives an opportunity to study cold excitons – cold composite bosons in materials. We will present spontaneous coherence and condensation, spin currents and spin textures, and spatial ordering in cold excitons.

Indirect excitons are dipoles and their energy can be controlled by voltage. This gives an opportunity to build devices, which operate with excitons in place of electrons. We will present a proof of principle demonstration of excitonic circuit devices.

The energy control by voltage also gives an opportunity to create a variety of potential landscapes for indirect excitons and use them as a tool for studying basic properties of cold bosons. We will present spontaneous coherence and condensation of excitons in a trap and localization-delocalization transition of excitons in a lattice.

Non-Skoltech attendees should request access to the building in advance by sending their passport details to energy.colloquium@skoltech.ru

Colloquium schedule and information on how to get to the colloquium can be found at <http://www.skoltech.ru/research/en/events/energy-colloquium/>