



Seminarankündigung

Dienstag, 29. September 2015

13:00 Uhr

ZNN, Seminarraum EG 0.001

“Bose-Einstein condensation of excitons: Any light at the end of the tunnel?”

Predicted in the 1960's, Bose-Einstein condensation (BEC) of semiconductor excitons remains an open question both theoretically and experimentally. This situation was not foreseen since excitons are light mass quasi-particles made by a Coulomb bound electron-hole pair. BEC is thus expected to occur below a few Kelvins, i.e. directly accessible with standard cryogeny. Nevertheless, it has so far not been signalled by the long expected strong photoluminescence emitted by a condensed population of low energy bright excitons. Indeed, recent theoretical works have pointed out that the excitons ground-state being optically inactive, i.e. dark, BEC has then to be signalled by a macroscopic population of dark excitons. These can naturally not be directly resolved optically. Here, I will report recent experiments that indicate a dark state condensation of excitons. These are performed in a microscopic trap where the overall exciton density is kept constant while the bath temperature is varied. Thus, quantum statistical signatures are resolved and the quantum phase transition is mapped accurately.

Prof. Francois Dubin
Pierre and Marie Curie University Paris
France