

Friday, September 8th
4:10 – 5:00 PM
Barnard Hall 103

Two Dimensional Quantum Fluids in a Semiconductor

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Abstract:

Quantum fluids are macroscopic manifestation of a quantum behavior often times facilitated by reducing temperatures of a system. GaAs quantum well has long been a prototypical example of two-dimensional electron gas (2DEG) owing to high quality samples available from molecular beam epitaxy (MBE) growth. The GaAs 2DEG under small magnetic field behaves very much like a 2D Fermi liquid described by a non-interacting electrons with effective mass of $m^* < 0.1m_e$. A similar system can also be used to study bosonic quantum fluids as well by forming excitons or exciton-polaritons rather than relying on electrons. Superfluidity or Bose-Einstein condensation, hallmark signatures of a bosonic quantum fluid, is indeed observed in such a system. In this talk, I will present our effort to better understand both the boson and fermionic quantum fluids in these systems explored by single quantized vortex generation in exciton-polaritons and numerous electronic transport experiments.

Host: Anton Vorontsov

**** Refreshments served in the Barnard second floor atrium at 3:45 ****