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FACULTY OF PHYSICS
ARNOLD SOMMERFELD CENTER &
CENTER FOR NANOSCIENCE
CHAIR FOR THEORETICAL SOLID STATE PHYSICS



Condensed Matter Theory Seminar

Friday, May 18, 2018
9 am s.t.

Room A 450 / Theresienstr. 37, IV

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Chiral spin-liquid with spinless cold atoms

Lattices with continuously degenerate band structures are remarkable for their capacity to host rich physics. Examples include (i) lattices having moat-like bands, i.e., a band with infinitely degenerate energy minima attained along a closed line in the Brillouin zone, and (ii) flat-band lattices. It is entirely the effect of correlations which lifts this degeneracy and leads to an amazing variety of novel quantum many-body states. In this talk I will show that if a moat-band optical lattice is populated with hard-core bosons, the degeneracy prevents their condensation at low densities. Such degeneracy of the kinetic energy favors a chiral spin-liquid state with anyonic quasiparticles, leading to statistical transmutation and topological order. The velocity distribution of the released gas of bosons is a sensitive probe of the chiral spin-liquid state.

Gez.: Oleg Yevtushenko