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**Exotic Quantum States of Rashba Bosons** TIGRAN SEDRAKYAN,  
ALEX KAMENEV, Fine Theoretical Physics Institute, University of Minnesota,  
LEONID GLAZMAN, Department of Physics, Yale University — The recently discovered spin-orbit coupled boson systems are remarkable for their capacity to explore physics that may not be revealed in any other way. The spin-orbit couplings, which can be artificially engineered in cold-atom experiments, in many instances lead to single-particle dispersion relations exhibiting multiple minima or even degenerate manifold of minimal energy states. It is entirely the effect of collisions (i.e. boson-boson interactions) which lifts this degeneracy and leads to an amazing variety of completely new quantum many-body states. This talk describes a theoretical discovery of a novel phase of matter that realizes for Rashba spin-orbit coupled bosons, where, at low densities, bosons essentially redress themselves and behave as fermions. This state is a composite fermion state with a Chern-Simons gauge field and filling factor one.

Tigran Sedrakyan  
Fine Theoretical Physics Institute, University of Minnesota

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