COLLOQUIUM

Department of Physics

Far-from-equilibrium superfluidity: quenches and delights

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Abstract

Traditionally, physicists are interested in studying new phases of matter. Superconductors, superfluids, ferromagnets, liquid crystals are a tribute to the extraordinary capability of matter to acquire new forms and properties. Over past decade, researchers working in condensed matter physics have studied a new kind of phase transitions that emerge in correlated matter out of equilibrium. Contrary to naive expectations, quantum matter driven far from equilibrium can acquire phases completely different from its ground state counterparts. In this talk I shall describe the results of our recent efforts to understand the formation of novel states in quenched superfluids. For a particular set of initial conditions, I will discuss two new states of matter: (a) gapless steady state and (b) spatially modulated steady state emerging due to the Cooper pair turbulence and describe the experiments that can probe these states. I shall also make connections between our theory and theories describing the "cosmological experiments" of defect formation in the early University.

Monday, February *26,* 2018 at 3:00 pm

SERC, Room 408

Refreshments will be served at 2:45 pm