COLLOQUE DE PHYSIQUE EPFL

EPFL PHYSICS COLLOQUIUM

Monday, November 17, 2014, 16:15

Room CE1

Prof. Martin Zwierlein
Department of Physics, MIT

A Little Big Bang: Strong Interactions in Ultracold Fermi Gases

A great challenge of many-body physics is to understand strongly interacting systems of fermions, such as high-temperature superconductors, neutron stars, and the quark-gluon plasma of the early universe. Ultracold Fermi gases of atoms have emerged as a paradigmatic form of fermionic matter, where interactions can be made as strong as quantum mechanics allows. The superfluid critical temperature is 17% of the Fermi temperature, so, scaled to the density of electrons, superfluidity would occur far above room temperature. Non-equilibrium processes are observable in real time, for example the collision of spin up and spin down gases with strong interactions, or the propagation of topological excitations in the superfluid phase. Our measurements in and out of equilibrium provide benchmarks for many-body theories of Fermi systems.

Host: T. Kippenberg, 34428, tobias.kippenberg@epfl.ch

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