

Singlet and triplet pairing in nuclear and cold atomic systems

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Nuclear pairing, i.e., the tendency of nucleons to form pairs, has important consequences to the physics of neutron star crusts and heavy nuclei. The usual pairing found in nuclei happens between identical nucleons and in singlet states, while recent investigations have shown that certain heavy nuclei might exhibit triplet and mixed-spin pairing correlations in their ground states. In this talk, I will present new investigations on the effect of nuclear deformation on these novel superfluids. Signatures of these pairing effects can be directly seen in nuclear experiments on spectroscopic quantities and two-particle transfer direct reaction cross sections. Indirectly, pairing correlations of nuclear superfluidity can be probed in cold-atomic experiments utilizing Feshbach resonances. On that note, preliminary results on phenomenological investigations of s - and p -wave pairing in cold-atomic gases will also be discussed.

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