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Exotic nuclear superfluidity in heavy nuclei

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Nuclear pairing, i.e., the tendency of nucleons to form pairs, has important consequences to the physics of heavy nuclei and compact stars. While the pairing found in nuclei typically happens between identical nucleons and in spin-singlet states, the exotic spin-triplet and mixed-spin pairing phases have also been hypothesized. In this talk, I will present new investigations confirming the existence of these novel superfluids, even at the face of the antagonizing nuclear deformation, at regions that can be experimentally accessible. These results also provide general conclusions on superfluidity in deformed nuclei. These exotic superfluid phases can modify proposed manifestations of pairing in nuclear collisions and have clear signatures in experiments in spectroscopic quantities and two-particle transfer direct reaction cross sections.

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