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About anomalous superfluidity, superconductivity and ferromagnetism in nuclear systems

Tuesday 28 September 2021 09:00 (45 minutes)

First $1S_0$ nn and pp pairings in baryon matter will be discussed. Then focus will be made on the study of phases of the complex neutral and charged vector boson coupled with magnetic field by the Zeeman coupling. I will discuss presence of nonmagnetic and ferromagnetic superfluid phases. It will be shown that in a strong magnetic field spin-triplet pairing and ferromagnetic superfluidity continue to exist above the “old” phase-transition critical temperature. Spin-triplet pairing of neutral and charged fermions at negligible spin-orbital interaction will be similarly considered. Then various sub-phases of $3P_2$ nn, pp and $3S_1$ np pairings in baryon matter will be described. Some estimates will be done in the BCS limit and beyond.

Author: VOSKRESENSKY, Dmitry (JINR)

Presenter: VOSKRESENSKY, Dmitry (JINR)