QUANTUM SHELLS IN NUCLEI AND BEYOND

V. Nesterenko
Joint Institute for Nuclear Research
E-mail: nester@theor.jinr.ru

The present review covers historical aspects and present status of quantum shells (QS) in nuclei and some other quantum systems. The relation of QS with various nuclear features (deformation, pairing, giant resonances etc) is outlined. QS in nuclei and atomic clusters are compared. Supershells in atomic clusters are briefly described. Further, the recent studies related with QS in nuclei are reviewed, first of all, for superheavy (SH) nuclei. The last experimental and theoretical results for K-isomers are briefly discussed. Predictions for magic numbers in SH nuclei, obtained in modern density-functional theory (DFT) (with relativistic, Skyrme and Gogny forces), are outlined. Finally, we present some last Skyrme DFT results of our group for shell effects in low-energy spectra of nobelium isotopes.