RCNP
NUCLEAR PHYSICS
EXPERIMENT SEMINAR

Title Isomers and shape coexistence in neutron-rich nuclei approaching the N = 126 shell closure

Speaker Philip M. Walker (University of Surrey, UK)

Date/Time Tuesday 25th Jul 2017, 14:00 p.m.

Place Lecture room 1, 6th floor, RCNP Main Building

Abstract:

The meta-stability of nuclear isomers leads to a variety of experimental opportunities [1], including applications such as controlled energy release and the possibility of gamma-ray lasers. Isomers can also serve as “stepping stones” to probe the structure of exotic nuclei – an aspect that is now opening up with the new generation of radioactive-beam facilities.

This talk will address nuclear structure issues that arise in the upper parts of the $50 \leq Z \leq 82$ and $82 \leq N \leq 126$ shells, where both proton and neutron Fermi levels are amongst prolate high-K orbitals or oblate low-K orbitals. The proton/neutron reinforcing shape-driving effects are predicted to give strong prolate-oblate shape coexistence, with collective oblate rotation being a favoured mode at high angular momentum. However, it seems likely that it will be the predicted high-K isomers that are needed for experimental access. Both the theoretical and experimental situations will be discussed.

[1] G.D. Dracoulis, P.M. Walker and F.G. Kondev, Rep. Prog. Phys. 79 (2016) 076301.

Contact person: Eiji IDEGUCHI