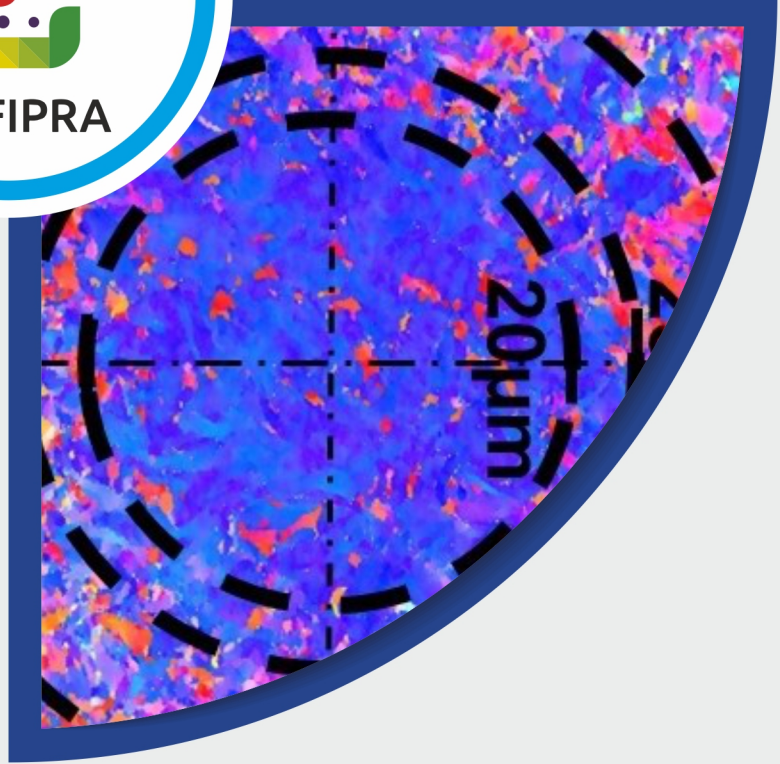
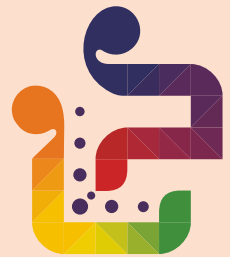


ANNUAL
REPORT
2021-22



Indo-French Centre for the
Promotion of Advanced Research

Centre Franco-Indien pour la
Promotion de la Recherche Avancée



CEFIPRA

Annual Report 2021-22

Indo-French Centre for the Promotion
of Advanced Research
(IFCPAR)

Centre Franco-Indien pour la Promotion
de la Recherche Avancée
(CEFIPRA)

Nuclear structure at the extreme of isospin and spin

Background

The project addresses an open question, viz., how do the internal properties of the complex many-body quantum system, the nucleus, evolve when there is an imbalance of neutron to protons (compared stable nuclei) AND simultaneously undergoing fast rotation. Studies have shown the presence of new phenomena like new shapes, change of shell structure etc. occur in exotic short lived nuclei. The present project will explore the presence of new phenomena as a function of isospin (neutron-proton asymmetry, N/Z) AND spin in particular around doubly magic $^{132}\text{Sn}^{126}$. A part of the work will use the VAMOS++ magnetic spectrometer and the Advance Gamma Tracking Array (AGATA) to study the prompt gamma rays emitted from the isotopically identified fission fragments produced in inverse kinematic reactions at energies around the Coulomb barrier (in France) increasing the selectivity and sensitivity by at least an order of magnitude over other methods.

Principal Collaborators



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Variable Energy Cyclotron Center,
Kolkata



Navin Alahari
Grand Accélérateur National d'Ions Lourds
Caen

Publications

- No. of publications in SCI journals: 1
- No. of papers presented in conferences: 4

Mobility Support

- India to France: 3
- France to India: 3

Pure & Applied Physics

Project No. 5604-4

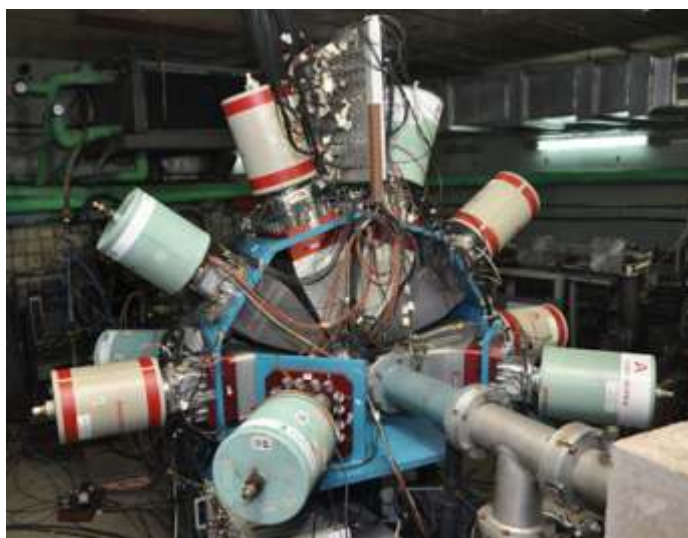
May 2017 to Apr. 2022

Objectives

- The evolution of nuclear structure of most neutron rich nuclei produced in fission for various elements ranging from Sr to Pm. In particular, the odd- Z isotopes around Sn will be investigated and presence of isomers will be looked for from prompt-delayed spectroscopy

Knowledge Generated/Products Developed

- Identification of isotopes (A, Z) has been done from data of experiment with VAMOS++ coupled to AGATA at GANIL
- Analysis on spectroscopy of Sb and In isotopes from AGATA data has been completed. Manuscript is under preparation
- Analysis of Pm isotopes from VAMOS++ coupled to EXOGAM
- One experiment at VECC has been performed to study the single particle and collective structures of ^{131}Xe , using Indian National Gamma Array (INGA) setup and alpha beam from K-130 cyclotron at VECC, Kolkata



The setup of Indian National Gamma Array (INGA) at the K-130 cyclotron at VECC, Kolkata. Figure shows the setup of 8 Compton suppressed Clover HPGe detectors and 2 LEPS (Low Energy Photon Spectrometer) of Indian National Gamma Array (INGA) at the K-130 cyclotron at VECC, Kolkata