

Resume (Dr. Ritwika Chakrabarti)



Name	Dr. Ritwika Chakrabarti
Designation	UGC-Assistant Professor, Department of Physics, University of Mumbai
Area of Research	Nuclear Physics: Experimental and theoretical Nuclear Structure, High-spin exotic nuclear phenomena
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Educational Qualifications

Degree	Year	University	Subjects
Ph.D.	2013	UGC-DAE Consortium for Scientific Research (Kolkata Centre), University of Calcutta	Nuclear Physics (Experimental) Title of thesis: Spectroscopic study of A~30 nuclei spanning the region from the valley of stability towards the island of inversion
M.Sc.	2005	University of Calcutta	Physics
B.Sc.	2003	University of Calcutta	Physics (Hons.)

Work Experience:

- 2018 March –till date : **UGC-Assistant Professor**, University Department of Physics,
University of Mumbai, Mumbai
- 2015 Nov. -2018 March : **Assistant Professor (Aided)**, Department of Physics, K. J. Somaiya
College of Science and Commerce, Vidyavihar, Mumbai.
- 2012 – 2013 : **Research Associate/ Post-Doctoral Fellow** at Nuclear Physics
Division, Bhabha Atomic Research Centre, Mumbai, India.

- 2010– 2012 : **Senior Research Fellow (Council of Scientific and Industrial Research (CSIR), Govt. of India)** at UGC – DAE Consortium for Scientific Research, Kolkata Centre, Kolkata, India.
- 2006 – 2010 : **Project Fellow-I** at UGC – DAE Consortium for Scientific Research, Kolkata Centre, Kolkata, India.
- 2006, Jan – 2006, June : **Research Intern** (under “**CSIR Diamond Jubilee Research Interns Awards**”) at Central Glass and Ceramic Research Institute, Kolkata, India.

Research Grants/Projects as Principal Investigator :

“Spectroscopic investigation of neutron-rich nuclei around $N = 32$ sub-shell closure”

Funded/sponsored by: UGC-DAE CSR, Kolkata Centre (Ref. No. UGC-DAE-CSR-KC/CRS/19/NP01/0911, dated 10th May 2019).

Research Collaboration:

1. Indian National Gamma Array (**INGA**) Collaboration, India.
2. Nuclear Physics Division, BARC, India.
3. UGC-DAE Consortium for Scientific Research, Kolkata Centre, India.
4. Inter University Accelerator Centre [Formerly, Nuclear Science Centre], India.
5. Tata Institute of Fundamental Research, India.
6. University of Notre Dame, USA.
7. University of Surrey, UK.
8. Variable Energy Cyclotron Centre, India.
9. Homi Bhabha Centre for Science Education, India.
10. Visva-Bharati University, India.

Experiments performed at:

1. INGA facility at the Tata Institute of Fundamental Research (TIFR), Mumbai, India.
2. INGA facility at the Variable Energy Cyclotron Centre (VECC), Kolkata, India.
3. INGA facility at the Inter-University Accelerator Centre (IUAC), New Delhi, India.
4. Scattering chamber for nuclear reaction studies at TIFR, Mumbai, India.

Ongoing Research Activity

My research area encompasses both experimental and theoretical Nuclear Physics, with particular emphasis on study of Nuclear Structure, employing in-beam γ ray spectroscopy technique. The experiments are carried out by bombarding a target nucleus by energetic ions from an accelerator. The compound nucleus, thus formed, initially decays through emission of charged particles and neutrons. The residual nucleus, with its states at higher excitation energies and angular momenta, finally decay to its ground state by emitting γ rays. These deexciting γ rays are recorded by large detector arrays in order to retrieve information about the structure of the nucleus and its journey from higher angular momentum states to its ground state. Such studies are very much crucial to understand nuclear forces and various symmetries. Additionally, information on various exotic nuclear phenomena, nuclear shape and deformation, evolution of nuclear shell-structure and high-spin isomers are also obtained.

My ongoing research activity involves the study of the interplay between single particle and collective modes of excitations in $f_{7/2}$ -shell nuclei in the $A \sim 50$ mass region. These nuclei, with Z and N between 20 and 28, have low enough active valence particles to allow for a full shell-model description, at the same time, large enough to develop collective behavior with all its consequences. Single-particle and collective degrees of freedom compete to produce intriguing effects such as shape change, quasiparticle alignment, back-bending and band termination.

List of Publications (in peer-reviewed international journals):

1. Lifetime measurement and shell model description of negative parity states up to band-termination in ^{49}V

S. Mukhopadhyay, D. C. Biswas, L. S. Danu, **R. Chakrabarti**, U. Garg, S. K. Tandel, Y. K. Gupta, B. N. Joshi, G. K. Prajapati, B. V. John, S. Saha, J. Sethi, R. Palit, **Nuclear Physics A**, in press.

2. Nuclear Data Sheets for $A = 218$

Balraj Singh, M. S. Basunia, Murray Martin, E.A. McCutchn, Indu Bala, R. Caballero-Folch, Rhiann Canavan, **Ritwika Chakrabarti**, A. Chekhovska, M.M. Grindler, Samra Kaim, Debasmita Kanjilal, D. Kasperovych, M. J. Kobra, H. Koura, Soumen Nandi, Adina Olacel, Abhilasha Singh, and B. P. E. Tee, **Nuclear Data Sheets**, **160 (2019) 405-471.**

3. Possible onset of multifaceted excitation modes in ^{29}Al

H. Sultana, R. Bhattacharjee, A. Chakraborty, M. A. Khan, S. S. Bhattacharjee, **R. Chakrabarti**, S. Das, U. Garg, S. S. Ghugre, R. Palit, R. Raut, S. Saha, S. Samanta, J. Sethi, A. K. Sinha, T. Trivedi, **Phys. Rev. C** **98, 014330 (2018)**

4. Extending the application of DSAM to atypical stopping media.

S. Das, S. Samanta, R. Bhattacharjee, R. Raut, S. S. Ghugre, A. K. Sinha, U. Garg, **R. Chakrabarti**, S. Mukhopadhyay, A. Dhal, M. Kumar Raju, N. Madhavan, S. Muralithar, R. P. Singh, K. Suryanarayana, P. V. Madhusudhana Rao, R. Palit, S. Saha, J. Sethi. **Nucl. Instrum. Methods Phys. Res. A** **841, 17 (2017)**

5. High spin γ -ray spectroscopy in ^{41}Ca

R. Bhattacharjee, S. Samanta, S. Das, S. S. Bhattacharjee, R. Raut, S. S. Ghugre, A. K. Sinha, U. Garg, **R. Chakrabarti**, S. Mukhopadhyay, A. Dhal, R. P. Singh, N. Madhavan, S. Muralithar. **Phys. Rev. C** **94, 054312 (2016).**

6. Spectroscopy and shell model calculations in Si isotopes

S.S. Bhattacharjee, R. Bhattacharjee, R. Raut, S. S. Ghugre, A. K. Sinha, T. Trivedi, L. Chaturvedi, U. Garg, S. Ray, B. K. Yogi, M. Kumar Raju, **R. Chakrabarti**, S. Mukhopadhyay, A. Dhal, R. P. Singh, N. Madhavan, S. Muralithar, S. Saha, J. Sethi, R. Palit., **Phys. Rev. C** **91, 044306 (2015).**

7. Level lifetimes of ^{32}P obtained using the Doppler-shift attenuation method with thick molecular targets

R. Bhattacharjee, S. S. Bhattacharjee, K. Basu, P. V. Rajesh, R. Raut, S. S. Ghugre, D. Das, A. K. Sinha, L. Chaturvedi, U. Garg, S. Ray, B. K. Yogi, M. Kumar Raju, **R. Chakrabarti**, S. Mukhopadhyay, A. Dhal, R. P. Singh, N. Madhavan and S. Muralithar, **Phys. Rev. C** **90, 044319 (2014).**

8. Nuclear structure study of ^{26}Mg following heavy-ion induced fusion-evaporation reaction.

S. S. Bhattacharjee, R. Bhattacharjee, R. Chakrabarti, S. S. Ghugre, A. K. Sinha, T. Trivedi, L. Chaturvedi, S. Saha, J. Sethi, and R. Palit, **Phys. Rev. C** **89**, 024324 (2014).

9. Fission fragment angular distributions in $^{6,7}\text{Li} + ^{235,238}\text{U}$ reactions

A. Parihari, S. Santra, A. Pal, N. L. Singh, K. Mahata, B. K. Nayak, R. Tripathi, K. Ramachandran, P. K. Rath, R. Chakrabarti and S. Kailas, **Phys. Rev. C** **90**, 014603 (2014).

10. Fission fragment mass and angular distribution in $^{6,7}\text{Li} + ^{235,238}\text{U}$ reactions

S. Santra, A. Parihari, N. L. Singh, B. K. Nayak, B. R. Behera, K. Mahata, K. Ramachandran, Varinderjit Singh, A. Pal, R. Chakrabarti, S. Appannababu, R. Tripathi, S. Sodaye, P. Sugathan, A. Jhingan, E. Prasad, K. S. Golda, D. Patel, and S. Kailas, **EPJ Web Conferences** **63**, 02016 (2013).

11. Half-life of the $I^\pi = 4^-$ intruder state in ^{34}P Using $\text{LaBr}_3:\text{Ce}$ Fast Timing

P. J. R. Mason, T. Alharbi, P. H. Regan, N. Mărginean, Zs. Podolyák, N. Alkhomashi, P. C. Bender, M. Bowry, M. Bostan, D. Bucurescu, A. M. Bruce, G. Căta-Danil, I. Căta-Danil, R. Chakrabarti, D. Deleanu, P. Detistov, M. N. Erduran, D. Filipescu, U. Garg, T. Glodariu, D. Ghiță, S. S. Ghugre, A. Kusoglu, R. Mărginean, C. Mihai, M. Nakhostin, A. Negret, S. Pascu, C. Rodríguez Triguero, T. Sava, E. C. Simpson, A. K. Sinha, L. Stroe, G. Suliman, and N. V. Zamfir, **Journal of Physics: Conference Series** **381**, 012063 (2012).

12. Half-life of the $I^\pi = 4^-$ intruder state in ^{34}P : $M2$ transition strengths approaching the island of inversion

P. J. R. Mason, T. Alharbi, P. H. Regan, N. Mărginean, Zs. Podolyák, E. C. Simpson, N. Alkhomashi, P. C. Bender, M. Bowry, M. Bostan, D. Bucurescu, A. M. Bruce, G. Căta-Danil, I. Căta-Danil, R. Chakrabarti, D. Deleanu, P. Detistov, M. N. Erduran, D. Filipescu, U. Garg, T. Glodariu, D. Ghiță, S. S. Ghugre, A. Kusoglu, R. Mărginean, C. Mihai, M. Nakhostin, A. Negret, S. Pascu, C. Rodríguez Triguero, T. Sava, A. K. Sinha, L. Stroe, G. Suliman, and N. V. Zamfir, **Phys. Rev. C** **85**, 064303 (2012).

13. Gamma-ray fast-timing coincidence measurements from the $^{18}\text{O}+^{18}\text{O}$ fusion-evaporation reaction using a mixed $\text{LaBr}_3\text{-HPGe}$ array

T. Alharbi, P. J. R. Mason, P. H. Regan, Zs. Podolyák, N. Mărginean, M. Nakhostin, M. Bowry, D. Bucurescu, G. Căta-Danil, I. Căta-Danil, D. Deleanu, D. Filipescu, T. Glodariu, D. Ghiță, R. Mărginean, C. Mihai, A. Negret, S. Pascu, T. Sava, L. Stroe, G. Suliman, N. V. Zamfir, A. M. Bruce, C. Rodríguez Triguero, P. C. Bender, U. Garg, M. N. Erduran, A. Kusoglu, M. Bostan, P. Detistov, N. Alkhomashi, A. K. Sinha, R. Chakrabarti, S. S. Ghugre., **App. Rad. Isotopes** **70**, 1337 (2012).

14. Structure of ^{32}P at high spins

R. Chakrabarti, S. Mukhopadhyay, R. Bhattacharjee, S. S. Ghugre, A. K. Sinha, A. Dhal, L. Chaturvedi, M. Kumar Raju, N. Madhavan, R. P. Singh, S. Muralithar, B. K. Yogi and U. Garg., **Phys. Rev. C** **84**, 054325 (2011).

15. Experimental study of nuclei in the vicinity of the “island of inversion” through the fusion-evaporation reaction

R. Chakrabarti, S. Mukhopadhyay, Krishichayan, A. Chakraborty, A. Ghosh, S. Ray, S. S. Ghugre, A. K. Sinha, L. Chaturvedi, A. Y. Deo, I. Mazumdar, P. K. Joshi, R. Palit, Z. Naik, S. Kumar, N. Madhavan, R. P. Singh, S. Muralithar, B. K. Yogi and U. Garg., **Phys. Rev. C** **80**, 034326 (2009).

16. Structure of dipole bands in ^{106}In

A. Y. Deo, R. Palit, Z. Naik, S. Sihotra, S. Kumar, P. K. Joshi, I. Mazumdar, R. Chakrabarti, R. Kshetri, D. Mehta and H. C. Jain., **Phys. Rev. C** **79**, 067304 (2009).

17. Emission analysis of Eu^{3+} : $\text{CaO-La}_2\text{O}_3\text{-B}_2\text{O}_3$ glass

Ritwika Chakrabarti, Maumita Das, B. Karmakar, K. Annapurna and S. Buddhudu, **Journal of Non-Crystalline Solids** **353**, 1422 (2007).

18. Absorption and emission spectral analysis of Pr^{3+} : tellurite glasses

K .Annapurna, **Ritwika Chakrabarti**, S. Buddhudu, **Journal of Materials Science** **42**, 6755 (2007).