

ANNEXURE I

Dossier of Prof. Rupayan Bhattacharya (Dr.)

PERSONAL PARTICULARS :

1.1	Full Name	Rupayan Bhattacharya
	Date of birth	: June 18 th , 1951
	Place of birth	: Calcutta, India
	Position (now)	: UGC Emeritus Fellow, University of Calcutta
	Address for correspondence	: Prof. R. Bhattacharya 2B N.B. Lane Belgharia Kolkata - 700056
	E-mail	: rup_bhat@hotmail.com
	Mobile No.	: 9830273693

1.2 Details of qualifications obtained :

1984	:	Ph.D., University of Calcutta Theoretical Nuclear Physics
1973	:	M.Sc, University of Calcutta First Class with National Loan Scholarship
1971	:	B.Sc. (Physics Honours), University of Calcutta First Class with National Scholarship
1968	:	Higher Secondary, West Bengal Board of Secondary Education First Division with National Scholarship

1.2a Awards obtained :

1968	National Scholarship for excellence
1971	National Loan Scholarship for excellence
2011	UGC Emeritus Fellowship

1.3 Details of Work Experience :

1.3.1 Positions Held and Duties Performed :

Dec. 2011 to Dec. 2013	:	Emeritus Fellow, University of Calcutta, Research in Nuclear Physics
1997 to June, 2011	:	Principal and Professor, Gurudas College Research in Theoretical Nuclear Physics and Administrative work.
1996 to 1997	:	Visiting Scientist in Variable Energy Cyclotron Centre Research in Theoretical Nuclear Physics.
1990 to 1996	:	Lecturer in Physics, University of Botswana, Botswana Taught physics theory and lab courses at undergraduate as well as postgraduate level and Research in Theoretical Nuclear Physics.
1987 to 1990	:	Senior Lecturer in Physics, City College, Calcutta Taught physics theory and lab courses at undergraduate level and Research in Theoretical Nuclear Physics.
1979 to 1987	:	Lecturer in Physics, City College, Calcutta Taught physics theory and lab courses at undergraduate level and Research in Theoretical Nuclear Physics.
1978 to 1979	:	Working as Junior Scientific Officer at Variable Energy Cyclotron Center, India.

1977 to 1978 : Worked on the beam dynamics of the Cyclotron. Took an active part in getting the external beam. Did some preliminary experiments using 60 MeV alpha beam and optimized beam dynamics.
Lecturer at M.M.C. College, Calcutta

1975 to 1977 : Taught courses of theoretical physics and took lab courses.
Research Scholar at Saha Institute of Nuclear Physics
Studied proton induced nuclear reactions using low energy proton beams from the Cyclotron at S.I.N.P. and from the Van de Graaf generator at B.A.R.C.. Mumbai.

1.3.2 *Teaching Experience :*

I have over 35 years of full-time teaching experience and have taught the following courses :

- i) Post-M.Sc. Level Courses : Theoretical Nuclear Physics
- ii) M.Sc Level Courses : Quantum Mechanics, Classical Mechanics
- iii) B.Sc Level Courses : Classical Mechanics, Modern Physics, Electricity and Magnetism, Optics and Wave motion, General Physics and Lab Courses in Physics
- iv) Interdisciplinary Courses : Computer Programming

1.3.2.1 *Course Development :*

- a) Contributed towards development of a course on undergraduate theoretical physics for students of University of Calcutta.
- b) Developed a course of computer programming for research scholars in Physics of University of Calcutta.
- c) Developed along with one of the colleagues a course in Radiation Physics at the University of Botswana.

1.4 Current CTC: Rs. 5,53,744/-

Expected CTC: Rs.8,40,000/-

NOTICE PERIOD: One week

CURRENT/PREFERRED LOCATION: Any where

2.1 *Important Seminar Given :*

At University of Padua, Italy

Topic : On the parabolic variation of rms charge radii of Ca-isotopes.

At University of Botswana, Botswana

Topic : Criticism on the role of occupancy in the ground state charge distribution of 208-Pb.

Approach to criticality in a multifragmentating system.

Who is SHE (Super Heavy Element) ?

At Variable Energy Cyclotron Centre, Calcutta, India

Topic : Universality in the multifragmentation process.

At Saha Institute of Nuclear Physics, Calcutta, India

Topic : Condition of stability in a multifragmenting system.

2.2 Curriculum development :

Developed a curriculum for an optional course : RADIATION PHYSICS for the Year four students of the University of Botswana

3. RESEARCH AND PUBLICATION: (In peer-reviewed journals and in conferences)

- 1) ^{146}Gd , a doubly magic nucleus : Phys. Rev. C24, 1810 (1981)
P. Mukherjee, R. Bhattacharya, I. Mukherjee
- 2) Interpretation of the reaction $^{210}\text{Po}(d,p)^{211}\text{Po}$ in terms of the core particle Model :
J. Phys.G8,1085 (1982)
P. Mukherjee, R. Bhattacharya, R. Majumder, I. Mukherjee
- 3) Effect of core polarisation on the charge distribution in ^{208}Pb : Phys. Rev. C28, 1396 (1983)
P. Mukherjee, R. Bhattacharya, C. Samanta
- 4) On the geometrical shape of the single particle spin-orbit potential : Zeit. Fur Physik A322, 665 (1985)
R. Bhattacharya
- 5) Valence proton orbit radii and total rms charge radii in the tin region : Phys. Rev. C33, 2185 (1986)
R. Bhattacharya
- 6) The effect of average one body potential on the orbit radii measurements in the lead region : Zeit. Fur Physik A327, 31 (1987)
R. Bhattacharya
- 7) On the utility of a global set of potential parameters : Zeit. Fur Physik A330, 1 (1988)
R. Bhattacharya
- 8) Neutron strengths of the unbound $1j_{13/2}$, $2h_{11/2}$ and $1k_{17/2}$ shell model states of ^{209}Pb : Phys. Rev. C37, 1708, (1988)
R. Majumder and R. Bhattacharya
- 9) The distribution of ^{205}Tl proton hole states and estimation of the rms radii of ^{206}Pb and ^{208}Pb from their charge distribution : Zeit. Fur Physik A340, 437 (1989)
R. Bhattacharya and R. Majumder
- 10) How core polarisation affects proton and neutron distribution in ^{208}Pb :
Nuclear Physics Symposium, D.A.E. (1982)
R. Bhattacharya
- 11) Investigation on the structures of some closed shell nuclei : Ph. D. Thesis (1984), unpublished
R. Bhattacharya
- 12) Systematics of the rms radii of the valence nucleons : Nuclear Physics Symposium, D.A.E. (1985)
R. Bhattacharya
- 13) Universal behaviour of fragment distribution in multifragmentation processes: International Conference on Nuclear Reaction Mechanism, Calcutta (1989)
R. Bhattacharya
- 14) Charge distribution differences of Pb-isotopes from elastic electron Scattering and core polarisation effect : International Seminar on Direct Nuclear Reactions, Bangalore (1989)
R. Bhattacharya
- 15) The structure of the super neutronised doubly closed shell nucleus ^{132}Sn :

- International Nuclear Physics Conference, Sao Paulo (1989) - R. Bhattacharya
- 16) Dynamical scaling in multifragmentation reaction : Phys. Rev. C41, 2455 (1990)
R. Bhattacharya
 - 17) Investigation of the structure of ${}_{50}\text{Sn}^{132}$: Austr. J. Physics 45, 1 (1992)
R. Bhattacharya
 - 18) Stability in a fusion breakup system : Nucl. Phys. A545, 277 (1992)
R. Bhattacharya
 - 19) Isotopic variation of the rms charge radii of Ca isotopes : Phys. Rev. C48, 577 (1993)
R. Bhattacharya and K. Krishan
 - 20) Isotopic differences of charge distributions of even isotopes of Tin: Zeit. Fur Physik A349, 101 (1994)
R. Bhattacharya
 - 20) Scenario of charge distribution of f-p shell nuclei : Zeit. Fur Physik A351, 137 (1995)
R. Bhattacharya
 - 22) Variation of the rms radii in the N=50 region due to fragmentation of proton hole strengths near the Fermi surface: Acta Phys. Pol. 26, 11 (1995)
R. Bhattacharya
 - 23) Self consistent measurements of angular correlation of the 321 – 177 and 204 – 177 keV cascades in ${}^{125}\text{Te}$: Can. J. Phys. 75,591 (97)
C.C. Dey, B.K. Sinha and R. Bhattacharya
 - 24) Structure of the one neutron halo nuclei ${}^{11}\text{Be}$ and ${}^{19}\text{O}$: Phys. Rev. C56, 212 (1997)
R. Bhattacharya and K. Krishan
 - 25) Skyrme-Hartree-Fock approach to the change of level occupancy of low mass halo nuclei : Pramana 54, 247 (2000)
R. Bhattacharya
 - 26) Criticism on the role of occupancy in the ground state charge distribution of ${}^{208}\text{Pb}$: International Symposium on Nuclear Physics, Los Alamos (1990)
R. Bhattacharya
 - 27) Universality in the temporal evolution of a multifragmentating system : International Workshop on Nuclear Dynamics, Marciana Marina (1990)
R. Bhattacharya
 - 28) Ground state charge distribution of isotopes of tin : Third ANSTI Seminar in Physics, Gaborone (1991)
R. Bhattacharya
 - 29) Stability in a Fusion – Breakup system : International Workshop on Dynamical Fluctuations and Correlations in Nuclear Collisions, Assois (1992)
R. Bhattacharya
 - 30) Approach to criticality in a multifragmentating system : International Nuclear Physics Conference, Wiesbaden (1992)
R. Bhattacharya
 - 31) Variation of the rms charge radii of tin isotopes : PANIC XIII, Perugia (1993)
R. Bhattacharya
 - 32) Multifragmentation with mass loss : International Conference on Nucleus - nucleus Collisions, Taormina (1994)
R. Bhattacharya
 - 33) Who is SHE ? : International Workshop on heavy ion induced fusion, Padua (1994)
R. Bhattacharya
 - 34) Charge radius staggering from Skyrme-Hartree-Fock theory : SAIP'95, Western Cape (1995)
R. Bhattacharya
 - 35) Effects of fragmentation of proton hole strengths on the charge distribution of Zr-Mo isotope : International Nuclear Physics Conference, Beijing (1995)
R. Bhattacharya
 - 36) Odd-even staggering effect in the light of Skyrme HF theory : International Workshop on Nuclear Correlations, Romania (1995)
R. Bhattacharya
 - 37) Semi-microscopic description of the exotic nuclei ${}^{11}\text{Be}$ and ${}^{19}\text{O}$: D.A.E. Symposium (1996)

- R. Bhattacharya and K. Krishan
- 38) Skyrme Hartree-Fock approach to change of level occupancy in the low mass halo nuclei : International Workshop on Rare Nuclear Processes, New Delhi (1998)
- R. Bhattacharya
- 39) Structure of one proton halo nucleus ^{17}F : Presented in International Conference on Nuclear Physics, Mumbai, India (2000)
- R. Bhattacharya and K. Krishan
- 40) Formation of halo structures in oxygen isotopes through change of occupancy of levels near Fermi surface : Presented in International Conference on Nuclear Physics, Mumbai, India (2000)
- R. Bhattacharya
- 41) A microscopic complex potential description of elastic proton scattering from $A = 11$ nuclei : DAE symposium, (2002)
- M..Biswas, R. Bhattacharya and S. Roy
- 42) New areas of magicity around $N = 14$: DAE Symposium 2002 R. Bhattacharya
- 43) Doubly magic nucleus ^{78}Ni : DAE Symposium 2003 R. Bhattacharya
- 44) Simultaneous measurement of elastic, transfer and fusion cross-sections for the $^7\text{Be} + ^{27}\text{Al}$ system : DAE Symposium 2003
- K.Kalita, J.J. Das, S. Barua, S. Verma, S. Nath, N. Madhavan, P. Sugathan, A. Jhingan, T. Verghese, R. Singh, K. Ramchandran, K. Mahata, A. Navin, A. Chatterjee, S. Kailas, P. Basu, M. Sinha, H. Majumder, S. Bhattacharya, R. Bhattacharya, A.K. Sinha
- 45) Fusion cross sections for $^7\text{Li} + ^{16}\text{O}$ at energies above barrier : Physical Review C 68, 067601 (2003)
- M. Ray, A. Mukherjee, M. Saha Sarkar, A Goswami, S. Roy, S. Saha, R. Bhattacharya, B.R. Behera, S.K. Datta and B. Dasmahaptra
- 46) Comparative Study of ^6Li and ^7Be through SKHF theory : DAE Symposium 2004
- R. Bhattacharya, M. Sinha, H. Majumder, P. Basu
- 47) Investigation of Near Barrier Fusion of $^6\text{Li} + ^{28}\text{Si}$: DAE Symposium 2004
- M. Sinha, M. Biswas, A. Mukherjee, S. Roy, P. Basu, H. Majumder, B. Dasmahaptra, R. Bhattacharya, R. Palit, I. Majumdar, H.C. Jain, A. Shrivastava, S. Kailas
- 48) Investigation of elastic scattering with loosely bound nuclei ^6Li : Proc.DAE -BRNS symposium on Nucl.Phys.,50 (2005) 304
- M. Sinha, M. Biswas, A. Mukherjee, S. Roy, P. Basu, H. Majumder, B. Dasmahaptra, R. Bhattacharya, R. Palit, I. Majumdar, H.C. Jain, A. Shrivastava, S. Kailas
- 49) Elastic scattering and fusion cross sections for ^7Be , $^7\text{Li} + ^{27}\text{Al}$ systems: Phys. Rev. C73, 024609 (2006)
- R. Bhattacharya et al
- 50) Investigation of Near and Sub-Barrier Fusion of $^7\text{Li} + ^{28}\text{Si}$: DAE Proceedings, Vol. 52 (2007)
- H. Majumdar, Mandira Sinha, M. Biswas, M.K. Pradhan, Subinit Roy, P. Basu, R. Bhattacharya, and S. Kailas.
- 51) Experimental investigation of fusion of $^7\text{Li} + ^{28}\text{Si}$ above the Coulomb barrier: Phys. Rev. C 76, 027603 (2007)
- Mandira Sinha, H. Majumdar, R. Bhattacharya, P. Basu, S. Roy, M. Biswas, R. Palit, I. Majumdar, P.K. Joshi, H.C. Jain, S. Kailas
- 52) Sub-barrier fusion excitation for the system $^7\text{Li} + ^{28}\text{Si}$: Phys. Rev. C 78, 027601 (2008)
- Mandira Sinha, H. Majumdar, P. Basu, Subinit Roy, R. Bhattacharya, M. Biswas, M. K. Pradhan, and S. Kailas
- 53) Measurement of near and above barrier fusion excitations for $^7\text{Li} + ^{28}\text{Si}$: Nucl. Phys. A 805, 425 (2008)
- H. Majumdar, Mandira Sinha, P. Basu, R. Bhattacharya, Subinit Roy, S. Santra, M. Biswas, V.V. Parkar, B.R. Behera, K.S. Golda, S.K. Datta and S. Kailas
- 54) Above barrier fusion excitation of $^6\text{Li} + ^{28}\text{Si}$: Proc. Int. Symp. Nucl. Phys. 54, 306 (2009)
- Mandira Sinha, H. Majumdar, P. Basu, S. Roy, R. Bhattacharya, M.K. Pradhan, M. Biswas, R. Palit, I. Majumdar and S. Kailas
- 55) Sub- and Above barrier fusion of loosely bound ^6Li with ^{28}Si : Euro. Phys. Jour. A 44, 403 (2010)
- Mandira Sinha, H. Majumdar, P. Basu, S. Roy, R. Bhattacharya, M.K. Pradhan, M. Biswas, R. Palit,

- I. Majumdar and S. Kailas
- 56) Tensor Interaction in SkHF theory and its influence on evolution of nuclear shells: arXiv:1206.6937 [nucl-th] , 2012– R. Bhattacharya
 - 57) Tensor Interaction and its effect on Spin-orbit Splitting of Shell Model States of ^{208}Pb – Presented in ASYEOS International Conference held in Catania, Sicily, published in Proceedings of the ASY-EOS 2012 International Workshop on Nuclear Symmetry Energy and Reaction Mechanisms, pp 14, 2013 –R. Bhattacharya
 - 58) Effect of Tensor Interaction in Spin-orbit Splitting of Shell Model States – Presented in DAE-BRNS SYMPOSIUM IN NUCLEAR PHYSICS-2012, held in Delhi, published in symposium proceedings 57, 340 (2012) – R. Bhattacharya
 - 59) Study of N=16 shell evolution through tensor interaction – Accepted for presentation in International Conference ICRTNP 2012, held in Solan, India– R. Bhattacharya
 - 60) Influence of Tensor Interaction on Evolution of Nuclear Shells – Jour. Mod. Phys. 4, 33 (2013) R. Bhattacharya
 - 61) Evolution of shell structure and its implication on r-path abundance – accepted in INPC-2013, held in Florence, Italy – R. Bhattacharya
 - 62) Tensor interaction and its influence on evolution of nuclear shells – Nucl. Phys. A 913,1 (2013). R. Bhattacharya
 - 63) Method of looking at SHE – Accepted for presentation in ND 2013, held in New York City, USA R. Bhattacharya
 - 64) Emergence of new magic numbers N = 16 and 34 through tensor interaction in Skyrme Hartree Fock theory – arXiv:1310.4320 [nucl-th], 2013 – R. Bhattacharya
 - 65) Uses Of Tensor Induced Spin-orbit Splitting To Locate Spherically Doubly Magic SHE – accepted in ARCEBS2014 to be held in Kolkata – R. Bhattacharya
 - 66) Shell quenching revisited - Presented in DAE-BRNS SYMPOSIUM IN NUCLEAR PHYSICS-2013, held in Mumbai, published in symposium proceedings 58, 64 (2013) – R. Bhattacharya
 - 67) Quantitative analysis of precise heavy-ion fusion data at above-barrier energies using Skyrme-Hartree-Fock nuclear densities – Phys. Rev. C 89, 034601 (2014) I.Gontchar, R. Bhattacharya and M. V. Chushnyakova
 - 68) Emergence of new magic numbers N = 16 and 32 through tensor interaction in Skyrme Hartree Fock theory – Pramana (accepted for publication) – R. Bhattacharya

Co-Editor of :

1. Physics in the service of Africa: Proceedings of the Third Regional ANSTI Seminar in Physics (1993)
2. Edited two course materials for undergraduates of Netaji Subhas Open University, West Bengal, India

Author of:

1. Chapters a) Band theory of solids, b) Magnetic properties of materials c) Electron theory in solids – Study materials for undergraduate courses of Netaji Subhas Open University, West Bengal, India

Referee of:

AFRICAN JOURNAL OF SCIENCE AND TECHNOLOGY

Since 1998 till my retirement in 2011 I had been working as the Professor-in-Charge of the Study Centre of Netaji Subhas Open University, run by the Govt. of West Bengal. I am also a member of the Board of Undergraduate Studies in Physics of Netaji Subhash Open University. I have edited and written a number of educational study materials in Physics of the same University.

Research Grant received:

Rs. 11.78 Lakh from Department of Atomic Energy – Board of Research in Nuclear Science.

One research fellow under my guidance has completed research (under Department of Atomic Energy, Govt. of India, funded project) on “Studies of near barrier Fusion and Break-up with radioactive nuclei” and has been awarded Ph.D under University of Calcutta in 2011.