For P.U. Webpage: from PU Emeritus Prof. DR. RAJ K. GUPTA,

Physics Department

Educational background:

- **M.Sc. (Hons. School)** Physics**,** Panjab University, Chandigarh (1962) 1st Division and 2nd Position in Merit list.
- **Ph.D**. **(Physics)**, Panjab University, Chandigarh (1967).

Professional background:

1965-69 Post-doctoral Fellow of **National Research Council of Canada** at Uni. Toronto and Saskatoon .
1969-70 Pool Officer (CSIR), Panjab University, Chandigarh.
1970-77 Lecturer in Physics, Panjab University Regional Centre for P-G Studies, Rohtak (Haryana), India.
1977-78 Reader in Physics, Viswa Bharti, Santiniketan, West Bengal, August 16, 1977- August 13, 1978.
1978-80 Lecturer in Physics, Panjab University, Chandigarh.
1980-87 Reader in Physics, Panjab University, Chandigarh.
1987-98 Professor of Physics, Panjab University, Chandigarh.
(1993-95) UGC National Fellow (University Grants Commission of India), August 2, 1993- July 31, 1995.
1998-2000 Professor of Physics (Re-employed, for 3 years), Panjab University, Chandigarh.
2000-03 CSIR Scientist, Govt. of India, New Delhi, Awarded for 3 years, Panjab University, Chandigarh.
2003-06 DST Sr. Research Scientist, Govt. of India, New Delhi, Awarded for 5 years, Pb. Uni., Chandigarh
2006-09 DST Ramanna Fellow, Govt. of India, New Delhi, w.e.f. July 2006, Awarded for 3 yrs., PU,CHD.
2009-2015 DST Emeritus Scientist, Govt. of India, New Delhi, Awarded for 3 years, Pb Uni., CHD.
Nov. 2015-todate PU Emeritus Professor, **Physics Department,** Panjab University, Chandigarh.

Awards/Prizes/ HONOURS/ Fellowships of academies, etc.:

National and International

1. **Best Paper Award** for Oral presentation of group work by **Sahila Chopra** at *ICNP2016: 18th International Conference on Nuclear Physics, held in Dubai during 8-9 May, 2016",* organized by World Academy of Science, Engineering and Technology.
2. **Life Time Achievement Award** presented by the Organizing Committee of the International Nuclear Physics Conference, helld at Chitkara Univesity, Brotiwala (Himachal Pradesh) on 19.11.2012.
2. **Awarded Ramanna Fellowship** of Department of Sc. & Tech., Govt. of India, New Delhi, w.e.f. July 2006, for 3 years, re-newable for another 3 years, at Panjab University, Chandigarh, India.
2. **Awarded Mercator Professorship of DFG** (Deutscheforschungsgemeinschaft), Germany, 2005-2006, at Frankfurt Institute for Advanced Studies (FIAS), Frankfurt.
3. **Volkswagen Foundation of Germany awarded research project** "Study of Fusion-Fission and related phenomena " for **5yrs**, upto March 2003, in collaboration with Prof. Werner Scheid, Giessen.
4. **National Society of Sciences Crafts \& Creative Arts (NSCA) National Science Day Award**, Feb. 1996, for predicting Cold Fusion process for synthesizing new (super-heavy) elements in the laboratory. This work was then nominated **for the 1997 Noble Prize in Physics.**
5. **Institute of Physics Publishing (Adam Hilger Pub.), Bristol, U.K.**, invited to write a book entitled "Cold Nuclear Phenomena: Fission, Fusion and Cluster Radioactivity"; under preparation.
6. **World Scientific Publications, Singapore** invited to edited a book entitled "Heavy Elements and Related New Phenomena", in collaboration with **Professor W. Greiner**, published in July 1999.
7. **Indian Association of Physics Teachers** invited to work as a Chief Editor of a New Series **New Horizons of Physics**, edited First Volume "Physics of Particles, Nuclei and Materials- Recent Trends", Narosa Publishing House Pvt. Ltd., New Delhi, 2002.
8. **UGC National Fellowship** awarded for two years (1993-95).
9. Nominated for the **Fellowship of National Academy of Sciences**, 1990.
10. **Awarded *Guest Professorship*** by **Deutscheforschungsgemeinschft(DFG- the German Research Society)** for 1 year (1990-91) on nomination from the President of the University of Frankfurt.
11. **Awarded *Guest Professorship*** by **WE-Heraeus Stiftung** for 3 months, 1991-92 at J.-L. Uni. Giessen.
12. **Visiting Fellow (Honorary title)**, Dept. of Chemistry, The University Newcastle upon Tyne, UK,1994

13. **"Hari Om Ashram Prerit Shri Harivallabhdas Chunilal Shah Research Endowment" Prize and Gold Medal**} for 1984-85 in Nuclear Physics.
14. **IAEA and UNESCO awarded Associate Member, ICTP, Trieste**, Italy, for **12 yrs**. during 1980-93.
15. **Alexander von Humboldt Senior (Dozenten) Fellow**, Germany, 1973-75 at the Inst. fur Theor. Phy., Frankfurt Univ.. **Re-visit invitations** awarded in 1993, 1998, 2005 and 2011
16. ***IAEA/UNESCO Fellow***, Inter. Centre for Theore. Physics, Trieste, Italy, for 6 months during 1971.
17. Panjab State Government Merit Scholarship, 1961-62.

Main area of work:

- Theoretical Nuclear Physics: Nuclear Structure, Heavy Ion Reaction, Fusion, Fission and Cluster Radioactivity, Cold Nuclear Phenomenon
- Quantum groups and algebra.

Books Published, edited and under preparation:

i) Modern Physics, R.K. Gupta, 1982, ULP Publication, Panjab Univ., Chandigarh, 195 pages.

ii) Heavy Elements and Related New Phenomena, Editors: W. Greiner and R.K. Gupta**, World Sc. Publication**, Singapore 1999, Vols. I and II, 1147 pages.

iii) *New Horizons of Physics Series*: Physics of Particles, Nuclei and Materials- Recent Trends**, Chief Editor of the Series and Editor** Raj K. Gupta, Narosa Publishers, New Delhi, 2002.

iv) Cold Nuclear Phenomena: Fission, Fusion and Cluster Radioactivity, **Institute of Physics Publishing (Adam Hilger Pub.), Bristol, U.K.,** under preparation.

Some recent publications:

1. Collective Clusterization in Hot and Rotating Nuclei: Preformed-cluster based Dynamical Cluster-decay Model. Raj K. Gupta, Sham K. Arun, Raj Kumar, and Niyti, International Review of Physics (I.RE.PHY.) **2** (2008) 369-384.
2. Universal function of nuclear proximity potential for Skyrme nucleus-nucleus interaction in semiclassical approach. R.K. Gupta, D. Singh, R. Kumar, and W. Greiner, J. Phys. G: Nucl. Part. Phys. **36** (2009) 075104 [11 pages].
3. Fusion-evaporation cross-sections for ^{64}Ni+^{100}Mo reaction using the dynamical cluster-decay model. S.K. Arun, R. Kumar, and R.K. Gupta, J. Phys. G: Nucl. Part. Phys. **36** (2009) 085105 (17pages).
4. Cluster radioactivity with effects of deformations and orientations of nuclei included. S.K. Arun, R.K. Gupta, S. Kanwar, B.B. Singh, and M.K. Sharma, Phys. Rev. C **80** (2009) 034317.
5. Angular momentum effects and barrier modification in sub-barrier fusion reactions using the proximity potential in the Wong formula. R. Kumar, M. Bansal, S.K. Arun, and R.K. Gupta Phys. Rev. C **80** (2009) 034618 (1-8).
6. Cluster radioactive decay within the preformed cluster model using relativistic mean field theory densities. BirBikram Singh, S.K. Patra, and Raj K. Gupta, Phys. Rev. C **82** (2010) 014607 (1-7).
7. Collective clusterization in nuclei and excited compound systems: The dynamical cluster-decay model. R. K. Gupta, Lecture Notes in Physics, "Clusters in Nuclei", Editor: C. Beck **Vol. 1** (2010) 223-262.
8. Establishing the island of stability for superheavy nuclei via the dynamical cluster-decay model applied to hot fusion reaction ^{48}Ca+^{238}U$\rightarrow^{286}$112*. Niyti, R. K. Gupta, and Walter Greiner J. Phys. G: Nucl. Part. Phys. **37** (2010) 115103 (12pp).
9. Relativistic mean-field study of the properties of Z=117 nuclei and the decay chains of ^{293,294}117 isotope. M. Bhuyan, S.K. Patra, and R. K. Gupta, Phys. Rev. C **83** (2011) 004300 (7pp).
10. Heavy ion reactions studied on Wong and Dynamical cluster-decay models using proximity potential for non-coplanar nuclei. R. K. Gupta and M. Bansal, Internat Rev. of Phys. (I.RE.PHY.) **5** (2011) 74.
11. Optical potential obtained from relativistic-mean-field theory-based microscopic nucleon-nucleon interaction: applied to cluster radioactive decays. BirBikram Singh, M. Bhuyan, S. K. Patra, and Raj K. Gupta, J. Phys. G: Nucl. Part. Phys. **39** (2012) 025101 (10pp).
12. Fusion-evaporation residue as a dynamical decay process in ^{48}Ca+^{249}Bk$\rightarrow^{297}$117* reaction. Kirandeep Sandhu, Manoj K. Sharma, and Raj K. Gupta, Phys. Rev. C **85** (2012) 024604 (1-8).
13. Skyrme forces and the fusion-fission dynamics of the ^{132}Sn+^{64}Ni$\rightarrow^{196}$Pt* reaction. Deepika Jain, Raj Kumar, Manoj K. Sharma, and Raj K. Gupta, Phys. Rev. C **85** (2012) 024615.
14. Cold nuclear phenomena and collisions between two non-coplanar nuclei.

Manie Bansal and Raj K. Gupta, Romanian J. Phys. **57** (2012) 18-35.

15. Fusion-evaporation residues and α-decay chains of the superheavy element Z = 115 formed in the ^{243}Am+^{48}Ca reaction using the dynamical cluster-decay model.
Raj Kumar, Kirandeep Sandhu, Manoj K. Sharma, and Raj K. Gupta, Phys. Rev. C **87** (2013) 054610.
16. One-neutron and noncompound-nucleus decay contributions in the ^{12}C+^{93}Nb reaction at energies near and below the fusion barrier.
Sahila Chopra, Manie Bansal, M K. Sharma, and Raj K. Gupta, Phys. Rev. C **88** (2013) 014615.
17. Spin density contribution in the optical potential of open j-shell nuclei.
Keshab C. Panda, Binod C. Sahu, and Raj K. Gupta, Phys. Rev. C **88** (2013) 034602 (1-12).
18. Decay and the related stability aspects of $^{266}_{104}$Rf* nucleus formed in ^{18}O+^{248}Cm reaction.
Kirandeep Sandhu, Manoj K. Sharma, Amandeep Kaur, and Raj K. Gupta,
Phys. Rev. C **90** (2014) 034610 (1-10).
19. Probing Nuclear Matter at the Extremes through application of Dynamical Cluster-decay Model to Superheavy Nuclei. Niyti, Manoj K. Sharma, Kirandeep Sandhu, Sahila Chopra, Raj K. Gupta,
Int. Rev. Phys. (IREPHY) **8** (2014) 86-101 (15 pages).
20. Non-compound nucleus decay contribution in ^{12}C+^{93}Nb reaction using various formulations of nuclear proximity potential. Sahila Chopra, Arshdeep Kaur, and Raj K. Gupta,
Phys. Rev. C **91** (2015) 014602 (1-9).
21. Evaporation residue cross-section in the decay of ^{254}No* formed in ^{206}Pb+^{48}Ca and its isotopic dependence using other Pb targets within the dynamical cluster-decay model.
Niyti, Raj K. Gupta, and Peter Otto Hess, Nucl. Phys. A **938** (2015) 22-44 (23 pages).
22. Determination of the compound nucleus survival probability P_{surv} for various ``hot" fusion reactions based on the dynamical cluster-decay model.
Sahila Chopra, Arshdeep Kaur, and Raj K. Gupta, Phys. Rev. C **91** (2015) 034613 (1-9).
23. α-decay chains of recoiled superheavy nuclei: A theoretical study.
Niyti, Gudveen Sawhney, Manoj K. Sharma, and Raj K. Gupta,Phys. Rev. C **91** (2015) 054606.
24. α versus non-α cluster decays of excited compound nucleus ^{124}Ce* using various formulations of nuclear proximity potential.
Arshdeep Kaur, Sahila Chopra, and Raj K. Gupta, Phys. Rev. C **91** (2015) 064601 (1-10).
25. Decay analysis of compound nuclei with masses A~30-200 formed in the reactions involving loosely bound projectiles. Mandeep Kaur, BirBikram Singh, Manoj K. Sharma, and Raj K. Gupta,
Phys. Rev. C **92** (2015) 024623 (1-8).
26. Decay of compound nucleus ^{297}118* formed in the reaction ^{249}Cf+^{48}Ca using the dynamical cluster-decay model. Gudveen Sawhney, Amandeep Kaur, Manoj K. Sharma, and Raj K. Gupta,
Phys. Rev. C **92** (2015) 064303 (1-12).
27. Non-coplanar compact configurations of nuclei and noncompound-nucleus contribution in fusion cross section of the ^{12}C+^{93}Nb reaction, Sahila Chopra, Hemdeep, Arshdeep Kaur, and Raj K. Gupta,
Phys. Rev. C **93**(2016) 024603 (1-11).
28. Product $P_{CN}P_{surv}$ or the ``reduced" evaporation residue cross section $\sigma_{ER}/\sigma_{fusion}$ for ``hot" fusion reactions studied on the dynamical cluster-decay model
Sahila Chopra, Arshdeep Kaur, Hemdeep, and R. K. Gupta, Phys. Rev. C **93** (2016) 044604
29. Non-Coplanar Nuclei in Heavy-Ion Reactions.
Sahila Chopra, Hemdeep, Arshdeep Kaur, and R. K. Gupta,
Inter. J. of Math., Computational, Physical, Elect. and Computer Engineering **10** (2016) 243-246.
30. Skyrme forces and decay of $^{266}_{104}$Rf* nucleus synthesized via different incoming channels.
Niyti, Aman Deep, Rajesh Kharab, Sahila Chopra, and Raj K. Gupta,
Phys. Rev. C **95** (2017) 034602.
31. Formation and decay of the compound nucleus ^{220}Th* within the dynamical cluster-decay model.
Hemdeep, Sahila Chopra, Arshdeep Kaur, and Raj K. Gupta, Phys. Rev. C **95** (2017) 014609..
32. Clustering effects and decay analysis of the light-mass N = Z and N ≠Z composite systems formed in heavy ion collisions. Manpreet Kaur, BirBikram Singh, S. K. Patra, and Raj K. Gupta,
Phys. Rev. C **95** (2017) 014611 (1-12)
33. Synthesis of the Z=122 superheavy nucleus via ^{58}Fe- and ^{64}Ni-induced reactions using the dynamical cluster-decay model, Sahila Chopra, Hemdeep, and Raj K. Gupta, Phys. Rev. C **95** (2017) 044603.