Bharathiar University

State University I "A++" Grade by NAAC I 46th Rank in MoE-NIRF
Maruthamalai Road, Coimbatore, Tamil Nadu - 641 046.

Dr M. BALASUBRAMANIAM

Professor
Department of Physics

Bharathiar University
Coimbatore, 641041
Tamil Nadu, India
E-mail: m.balou@buc.edu.in
Phone: 9487021118
Office Number: 0422-2428446

Research Area

- Superheavy Elements
- Ternary Fission Studies
- Exotic Decay Studies
- Low energy nuclear reaction
- Machine learning in Nuclear data Physics
- Machine Learning in Nuclear Physics

Courses Teaching

- Nuclear and Particle Physics
- Computational methods and Programming - Theory Course
- Classical Mechanics
- Research Methodology
- Computational methods and Programming - Lab Course (FORTRAN)
- Nuclear data for science & technology
- LATEX - A document preparation system
- Machine Learning and Python Programming
- PYTHON Programming Lab

Research Experience: 25

Teaching Experience: 20

Research Credentials

(as on September 2025 – Source: Google scholar)

H-index: 25 Citations: 2282 i10-index: 43

Publications

Books/Chapters: 1 National Journals: 3 Publication Database: 2
International Journals: 66

Education

Ph. D.
Subject : Physics
Institution : University Department
Affiliated University : Manonmaniam Sundaranar University
Year of Award : December 2001

PGDCA
Subject : Computer Application
Institution : University Department
Affiliated University : Manonmaniam Sundaranar University
Year of Award : March 1997

M. Sc.
Subject : Physics
Institution : University Department
Affiliated University : Manonmaniam Sundaranar University
Year of Award : April 1996

B. Sc.
Subject : Physics
Institution : Arumugam Pillai Seethai Ammal College
Affiliated University : Madurai Kamaraj University
Year of Award : April 1994

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

Projects
National Level
Ongoing - completed - 4

Research Guidance
Completed
Ph.D. - 8 M.Phil. - 18
On Going
Ph.D. - 3

Institutional Responsibilities
Deputy Coordinator - DST-PURSE (Phase - II)
Period :Jan 2016 - Dec 2020
Nature of Responsibility :PURSE Grant Management

Programs organized

1. Organized National level SERC School on "Nuclear physics from new perspectives" as Director of the School. - 23 Institutions with 47 participants and 15 experts (2017-02-07 - 2017-02-27)

2. Organized national level EXFOR-2023, the 9th DAE-BRNS workshop on Nuclear Reaction data and its compilation for EXFOR database (2023-11-18 - 2023-11-14)

Visits

1. Volkswagen research fellowship (in a VW project between Giessen University, Germany and Panjab University, Chandigarh, India) at Institut fur Theoretische Physik – II, Justus Liebig Universitat, Giessen, Germany (2000-06-01 - 2000-07-05)

2. Visiting Researcher at Frankfurt Institute of Advanced Studies (FIAS), Frankfurt, Germany (2009-06-01 - 2009-06-30)

3. Volkswagen research fellowship (in a VW project between Giessen University, Germany and Panjab University, Chandigarh, India) at Institut fur Theoretische Physik – II, Justus Liebig Universitat, Giessen, Germany (2001-10-01 - 2001-11-07)

4. Volkswagen research fellowship (in a VW project between Giessen University, Germany and Panjab University, Chandigarh, India) at Institut fur Theoretische Physik – II, Justus Liebig Universitat, Giessen, Germany (2002-03-30 - 2002-02-01)

5. Volkswagen research fellowship (in a VW project between Giessen University, Germany and Panjab University, Chandigarh, India) at Institut fur Theoretische Physik – II, Justus Liebig Universitat, Giessen, Germany (2002-09-30 - 2002-08-12)

6. DST-International Travel Support (2011-11-23 - 2011-11-28)

7. Travel award - DAE-BRNS, NDPCI, and Bharathiar University (2011-09-05 - 2011-09-09)

Publications

International Journals - 66

66. Empirical relations using symbolic regression models for cluster decay half-lives

Phys. Rev. C 111, 064605 (2025) - Published 9 June, 2025 (June 2025)
S. Madhumitha Shree and M. Balasubramaniam

65. Alpha-decay half-life predictions for superheavy elements through machine learning techniques

Eur. Phys. J. A 61, 32 (2025) (February 2025)
S Madhumitha Shree, M Balasubramaniam

64. Effect of channel temperature and mass window in the fission decay of 181Re*

Phys. Rev. C 101, 014614 (January 2022)
C Kokila, M Balasubramaniam

63. Signature of magic numbers in light exotic nuclei

International Journal of Modern Physics EVol. 30, No. 10, 2150089 (2021) (October 2021)
C Karthika, M Balasubramaniam

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

62. Pre-existence probability for the ternary fission of Cf isotopes

J. Phys. G: Nucl. Part. Phys. 48 025102 (December 2020)
C Kokila, M Balasubramaniam

61. Scission point model applied to 181Re* formed in 12C + 169Tm reaction

Eur. Phys. J. A 56, 148 (2022) (May 2020)
C Karthika, M Balasubramaniam

60. Mirror nuclei of 1n/2n halo systems as 1p/2p emitters

Phys. Rev. C 100, 054611 (2019) (September 2019)
C. Karthika and M. Balasubramaniam,

59. Role of channel temperature and mass window in the binary breakup of 236U*

Phys. Rev. C 100, 034607 (2019) (September 2019)
C. Kokila and M. Balasubramaniam

58. A generalized empirical formula for half-lives of alpha-decay fine structure

International Journal of Modern Physics E 28, 1950067 (2019) (September 2019)
I. Sreeja and M. Balasubramaniam

57. Scission point model for the mass distribution of ternary fission

Eur. Phys. J. A 55, 4 (2019) (April 2019)
C. Karthika and M. Balasubramaniam

56. An empirical formula for the half-lives of exotic two-proton emission

Eur. Phys. J. A 55, 33 (2019) (March 2019)
I. Sreeja and M. Balasubramaniam

55. In memory: Prof. Raj K. Gupta (1938–2019)

International Journal of Modern Physics E 28, 1977001 (2019) (March 2019)
M. Balasubramaniam and H. Stoecker

54. Equatorial, collinear trajectories in the ternary fission of 252Cf for various third fragments

Journal of Physics G: Nuclear and Particle Physics 46, 025103 (2019) (January 2019)
K R Vijayaraghavan, V Gokula Lakshmi, P Prema and M Balasubramaniam

53. Nuclear surface energy coefficients in cluster decay

Eur. Phys. J A 54, 156 (2018) (September 2018)
N.S. Rajeswari, C Nivetha and M. Balasubramaniam,

52. Dynamical model calculation to reconcile the nuclear fission lifetime from different measurement techniques

Phys. Rev. C 98, 021601(R) (2018) (August 2018)
M. T. Senthil Kannan, Jhilam Sadhukhan, B. K. Agrawal, M. Balasubramaniam, and Santanu Pal

51. An empirical formula for the half-lives of ground state and isomeric state one proton emission

Eur. Phys. J A 54, 106 (2018) (June 2018)
I. Sreeja and M. Balasubramaniam

50. Relative mass distributions of neutron-rich thermally fissile nuclei within statistical model

Phys. Rev. C 96, 034623 (2017) (September 2017)
Bharat Kumar, M. T. Senthil Kannan, M. Balasubramaniam, B. K. Agrawal and S. K. Patra,

49. Charge distribution in the ternary fragmentation of 252Cf

Eur. Phys. J A 53, 164 (2017) (August 2017)
M. T. Senthil Kannan and M. Balasubramaniam,

48. Ternary fission of superheavy elements

Phys. Rev. C 93, 014601 (2016) (January 2016)
M Balasubramaniam, KR Vijayaraghavan, K Manimaran

47. Ternary Fission

Pramana 85, 423 (2015) (August 2015)
M. Balasubramaniam, K.R. Vijayaraghavan, C. Karthickraj

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

46. True ternary fission

Phys. Rev. C 91, 044616 (2015) (April 2015)
KR Vijayaraghavan, M Balasubramaniam, W von Oertzen

45. Ternary-fission mass distribution of Cf 252: A level-density approach

Phys. Rev. C 90, 054611 (2014) (November 2014)
M Balasubramaniam, C Karthikraj, S Selvaraj, N Arunachalam

44. A study of measured neutron elastic differential neutron cross section for 23Na

J . Radioanal. Nucl. Chem. 302, 1043 (2014) (September 2014)
A. Kumar, M. Balasubramaniam, A. Chakraborty, B. P. Crider, S. F. Hicks, C.Karthikraj et al.,

43. Collinear versus triangular geometry: A ternary fission study

Phys. Rev. C 90, 024601 (2014) (August 2014)
K. R. Vijayaraghavan, M. Balasubramaniam, and W. von Oertzen

42. Role of neck-length parameter in dynamical cluster-decay model for the decay of 56Ni*

J. Phys. G: Nucl. Part. Phys. 41, 095101 (2014) (July 2014)
C. Karthikraj and M. Balasubramaniam

41. Exotic decay modes of odd-Z(105-119) superheavy nuclei

Eur. Phys. J. A 50, 105 (2014) (June 2014)
N. S. Rajeswari and M. Balasubramaniam

40. An empirical relation for cluster decay preformation probability

International Journal of Modern Physics E 23, 1450018 (2014) (May 2014)
An empirical relation for cluster decay preformation probability

39. Alpha accompanied ternary fission of superheavy nuclei

International Journal of Modern Physics E 22, 1350014 (2013) (September 2013)
S. Thakur, R. Kumar, K.R. Vijayaraghavan and M. Balasubramaniam

38. Alpha accompanied ternary fission of superheavy nuclei

International Journal of Modern Physics E 22, 1350014 (2013) (August 2013)
S. Thakur, R. Kumar, K.R. Vijayaraghavan and M. Balasubramaniam

37. Decay studies of 59Cu* formed in the 35Cl + 24Mg reaction using the dynamical cluster-decay model

Phys. Rev. C 87, 024608 (2013) (February 2013)
C. Karthickraj and M. Balasubramaniam

36. Decay studies of 59Cu* formed in the 35Cl + 24Mg reaction using the dynamical cluster-decay model

Phys. Rev. C 87, 024608 (2013) (February 2013)
C. Karthickraj and M. Balasubramaniam

35. Nuclear surface energy coefficients in ?-decay

J. Phys. G: Nucl. Part. Phys. 40, 035104 (2013) (January 2013)
N.S. Rajeswari and M. Balasubramaniam

34. Nuclear surface energy coefficients in ?-decay

J. Phys. G: Nucl. Part. Phys. 40, 035104 (2013) (January 2013)
N.S. Rajeswari and M. Balasubramaniam

33. Temperature-dependent binding energies in a dynamical cluster-decay model applied to the decay of hot and rotating 56Ni*

Phys. Rev. C 86, 014613 (2012) (July 2012)
C. Karthikraj, N. S. Rajeswari, and M. Balasubramaniam

32. Temperature-dependent binding energies in a dynamical cluster-decay model applied to the decay of hot and rotating 56Ni*

Phys. Rev. C 86, 014613 (2012) (July 2012)
C. Karthikraj, N. S. Rajeswari, and M. Balasubramaniam

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

31. Kinetic energies of cluster fragments in ternary fission of 252Cf

Eur. Phys. J. A 48, 27 (2012) (March 2012)
K. Vijayaraghavan, W. von Oertzen and M. Balasubramaniam

30. Kinetic energies of cluster fragments in ternary fission of 252Cf

Eur. Phys. J. A 48, 27 (2012) (March 2012)
K. Vijayaraghavan, W. von Oertzen and M. Balasubramaniam

29. Cluster pre-existence probability

Eur. Phys. J. A 47, 126 (2011) (October 2011)
N.S. Rajeswari, K. Vijayaraghavan and M. Balasubramaniam

28. Cluster pre-existence probability

Eur. Phys. J. A 47, 126 (2011) (October 2011)
N.S. Rajeswari, K. Vijayaraghavan and M. Balasubramaniam

27. All possible ternary fragmentation of 252Cf in collinear configuration

Phys. Rev. C 83, 034609 (2011) (March 2011)
K. Manimaran and M. Balasubramaniam

26. All possible ternary fragmentation of 252Cf in collinear configuration

N.S. Rajeswari, K. Vijayaraghavan and M. Balasubramaniam (March 2011)
K. Manimaran and M. Balasubramaniam

25. Ternary fission fragmentation of 252Cf for all possible third fragments

Eur. Phys. J. A 45, 293 (2010) (July 2010)
K. Manimaran and M. Balasubramaniam

24. Ternary fission fragmentation of 252Cf for all possible third fragments

Eur. Phys. J. A 45, 293 (2010) (July 2010)
Ternary fission fragmentation of 252Cf for all possible third fragments

23. Deformation and orientation effects in the ternary fragmentation potential of the 4He- and 10Be-accompanied fission of the 252Cf nucleus

J. Phys. G: Nucl. Part. Phys. 37 045104 (2010) (March 2010)
K. Manimaran and M. Balasubramaniam

22. Deformation and orientation effects in the ternary fragmentation potential of the 4He- and 10Be-accompanied fission of the 252Cf nucleus

J. Phys. G: Nucl. Part. Phys. 37 045104 (2010) (March 2010)
K. Manimaran and M. Balasubramaniam

21. https://doi.org/10.1088/0954-3899/37/4/045104

Int. J. Mod. Phys. E 18, 1509 (2009) (November 2009)
K. Manimaran and M. Balasubramaniam

20. Cluster radioactivity in trans-tin region using semi-empirical formula

Int. J. Mod. Phys. E 18, 1509 (2009) (August 2009)
K. Manimaran and M. Balasubramaniam

19. Three cluster model for the alpha-accompanied fission of Californium nuclei

Phys. Rev. C 79, 024610 (2009) (February 2009)
K. Manimaran and M. Balasubramaniam

18. The dynamical cluster-decay model of preformed clusters for a hot and rotating 116Ba* nucleus produced in the low-energy 58Ni+58Ni reaction

J. Phys. G: Nucl. Part. Phys. 32, 345 (2006) (February 2006)
R.K. Gupta, M. Balasubramaniam, R. Kumar, D. Singh, S.K. Arun and W.Greiner

17. Magic numbers in exotic light-nuclei near drip-lines

J. Phys. G: Nucl. Part. Phys. 32, 565 (2006) (February 2006)
R.K. Gupta, M. Balasubramaniam, S. Kumar, S.K. Patra, G. Munzenberg and W. Greiner,

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

16. . Optimum orientations of deformed nuclei for cold synthesis of superheavy elements and the role of higher multipole deformations

J. Phys. G: Nucl. Part. Phys. 31, 631 (2005) (May 2005)
R.K. Gupta, M. Balasubramaniam, R. Kumar, N. Singh, M. Manhas, and W.Greiner

15. Proton and alpha-radioactivity of spherical proton emitters

Phys. Rev. C 71, 014603 (2005) (January 2005)
M. Balasubramaniam and N. Arunachalam

14. Dynamical cluster-decay model for hot and rotating light-mass nuclear systems applied to low-energy 32S+24Mg->56Ni* reaction

Phys. Rev. C 71, 014601 (2005) (January 2005)
R.K. Gupta, M. Balasubramaniam, R. Kumar, D. Singh, C. Beck, and W. Greiner

13. New semi-empirical formula for exotic cluster decay

Phys. Rev. C 70, 017301 (2004) (July 2004)
M. Balasubramaniam, S. Kumarasamy, N. Arunachalam and R.K. Gupta,

12. Collective clusterization effects in light heavy ion reactions

Nucl. Phys. A 738, 479 (2004) (June 2004)
R.K. Gupta, M. Balasubramaniam, R. Kumar, D. Singh and C. Beck,

11. Emission of intermediate mass fragments from hot 116Ba* formed in low-energy 58Ni+58Ni reaction

J. Phys. G: Nucl. Part. Phys. 29, 2703 (2003) (December 2003)
M. Balasubramaniam, R. Kumar, R.K. Gupta, C. Beck and W. Scheid

10. Closed-shell effects from the stability and instability of nuclei against cluster decays in the mass regions 130-158 and 180-198

Phys. Rev. C 68, 034321 (2003) (September 2003)
R.K. Gupta, S. Dhauta, R. Kumar, M. Balasubramaniam, G. Munzenberg and W. Scheid

9. Cluster-decay of hot 56Ni* formed in 32S+24Mg reaction

Phys. Rev. C 68, 014610 (2003) (July 2003)
R.K. Gupta, R. Kumar, N.K. Dhiman, M. Balasubramaniam, W. Scheid and C.Beck

8. The formation and decay of superheavy nuclei produced in 48Ca-induced reactions

J. Phys. G: Nucl. Part. Phys. 29, 625 (2003) (February 2003)
S. Kumar, M. Balasubramaniam, R.K. Gupta, G. Munzenberg and W. Scheid

7. Structure effects in the region of superheavy elements via the alph-decay chain of 293118

J. Phys. G: Nucl. Part. Phys. 28, 2875 (2002) (October 2002)
R.K. Gupta, S. Kumar, R. Kumar, M. Balasubramaniam, and W. Scheid

6. The cluster-core model for halo-structure of light nuclei at the drip lines

J. Phys. G: Nucl. Part. Phys. 28, 699 (2002) (March 2002)
R.K. Gupta, S. Kumar, M. Balasubramaniam, G. Munzenberg, and W. Scheid

5. Decay of excited 116Ba* formed in 58Ni+58Ni reaction via the emission of intermediate mass fragments

Phys. Rev. C 65, 024601 (2002) (January 2002)
R.K. Gupta, M. Balasubramaniam, C. Mazzocchi, M. La Commara and W. Scheid

4. Cold 86Kr valley in superheavy Z=104-120 nuclei

J. Phys. G: Nucl. Part. Phys. 27, 867-881 (2001) (April 2001)
R.K. Gupta, M. Balasubramaniam, G. M\

3. Cold fission versus exotic cluster-decay in 234,236,238U nuclei

J. Phys. G: Nucl. Part. Phys. 26, 1373 (2000) (September 2000)
R.K. Gupta, D. Bir, M. Balasubramaniam and W. Scheid

2. The halo structure of neutron-drip line nuclei: (neutron) cluster-core model

J. Phys. G: Nucl. Part. Phys. 26, L23 (2000) (February 2000)
R.K. Gupta, M. Balasubramaniam, R.K. Puri and W. Scheid

Dr M. BALASUBRAMANIAM , Professor , Department of Physics

1. Heavy-ion emission in spontaneous decays of 249,252Cf nuclei

Phys. Rev. C 60, 064316 (1999) (November 1999)
M. Balasubramaniam and R.K. Gupta,

Publication Database - 2

2. IAEA-NDS EXFOR D6021 2009

The EXFOR library contains an extensive compilation of experimental nuclear reaction data, maintained by NDS-IAEA. (Click the link to see details)https://www-nds.iaea.org/exfor/servlet/X4sGetSubent?reqx=42746&subID=136021007 (March 2025)

G.Pandikumar, S. Ganesan, M.Balasubramaniam, Joseph Jermiah

1. IAEA-NDS EXFOR D6089 2009

The EXFOR library contains an extensive compilation of experimental nuclear reaction data, maintained by NDS-IAEA. (Click the link to see details)https://www-nds.iaea.org/exfor/servlet/X4sGetSubent?reqx=42753&subID=136089003 (March 2025)

K. Manimaran, Megha Bhike, C. Karthik and M. Balasubramaniam

National Journals - 3

3. Appearance/Disappearance of Magic Number in Light Nuclei

Journal of Nuclear Physics, Material Sciences, Radiation and Applications (August 2021)
C Karthika, C Kokila, M Balasubramaniam

2. T-dependent RMF Model Applied to Ternary Fission Studies

J. Nucl. Phys. Mat. Sci. Rad. A. Vol. 9, No. 1 (2021), pp.95–101 (August 2021)
C Kokila, C Karthika, M Balasubramaniam

1. Empirical formulae with angular momentum dependence for exotic one and two proton emissions

Indian Journal of Pure and Applied Physics 57, 655 (January 2019)
I. Sreeja and M. Balasubramaniam

Books/Chapters - 1

1. Dynamics of Collinear Ternary Fission

Wolfram von Oertzen,Springer, ISBN: 978-3-319-10198-9 (January 2015)
K. R. Vijayaraghavan and M. Balasubramaniam

Projects

Completed - 4

1. YOUNG SCIENTIST PROJECT Dynamical clusterization studies of fission like fragments from the excited light nuclei DST – SERB 8,13,000 (August 2003 - August 2006)

2. Studies on nuclear fission reaction process with orientation to nuclear data needs of India's advancStudies on nuclear fission reaction process with orientation to nuclear data needs of India's advanced reactor programed reactor program DAE-BRNS 12,11,000 (April 2009 - March 2013)

3. A study of heavy ion collisions in the heavy and superheavy mass region and the related phenomena UGC-MRP 6,09,000 (March 2010 - March 2013)

4. Statistical and dynamical description of particle accompanied fission of medium to heavy mass nuclei CSIR 4,89,000 (March 2019 - March 2022)