

Curriculum vitae

Dr. Dalip Singh Verma



Personal Details

Address: Associate Professor
Department of physics and Astronomical Science
School of Physical and Material Sciences,
Central University of Himachal Pradesh, India

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Citizenship India

Professional Qualifications

Ph.D. Physics (Theoretical Nuclear Physics)

Employment History

1. Government College for Girls, Sector-11, Chandigarh (3rd July, 2008 - 28th Feb, 2009)
2. Government College Bassa, Mandi (H.P.) (11th Dec, 2009 - 21st Nov, 2009)
3. Central University of Himachal Pradesh (22nd Nov, 2009 – till date)

Personal Distinctions

Invited Seminars and Invited Conference Presentations (last 5 years)

1. Fission Partition: A Reflection of Shell Closures, Online International Conference on Theoretical Aspects of Nuclear Physics, 15-20 February, 2021.
2. Theory of Compound Nucleus Reactions, MCM DAV College Kangra (H.P.), 13th May, 2019
3. Job Prospects & Career Options in Physics, Government College Dhaliara, Kangra (H.P.), 3rd October, 2019.

Professional Contributions (last 5 years)

Teaching

- | | |
|---------------------------------------|-------------------------------------|
| 1. Theoretical Nuclear Physics | 6. Semiconductor Device |
| 2. Nuclear and particle Physics (PG) | 7. Electronic Circuits |
| 3. Nuclear and particle Physics (UG) | 8. Nuclear radiation and Safety |
| 4. Atomic Molecular and Laser Physics | 9. Elements of Modern Physics |
| 5. Analog and digital electronics | 10. Accelerator and Reactor Physics |

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|--------------------------------------|---|
| 11. Classical Electromagnetic Theory | 17. Scientific Writing and Presentation |
| 12. Nuclear and particle Physics Lab | 18. Analog and digital electronics lab |
| 13. Modern Physics Lab | 19. Advanced Nuclear Physics |
| 14. Electronics lab | 20. General Physics lab |
| 15. Special Functions | 21. Digital Systems and Applications |
| 16. Advanced Modern Physics Lab | 22. Research and Publication Ethics |

Doctoral Thesis Supervision/PG Dissertations

1. In Progress: 02
2. Completed: 01 ("Dynamics of the fragments and related phenomena in heavy-ion reaction")
3. PG. Dissertations: 32

University Administration

1. Member IQAC
2. Member BOS and School Board
3. Member DSC
4. Coordinator Admission committee (UG, PG and Ph.D. Programme)

Research Projects and Income

Publications

Edited Books

1. Handbook of Materials Characterization,
Suren Kumar Sharma, **Dalip Singh Verma**, Latif Ullah Khan, Shalendra Kumar
and Sher Bahadar Khan,
ISBN 978-3-319-92954-5, ISBN 978-3-319-92955-2 (eBook)
<https://doi.org/10.1007/978-3-319-92955-2>

Refereed Journal Articles

2. Angular momentum effects on the decay modes of hot compound nuclei formed in $^{86}\text{Kr} + ^{134,138}\text{Ba}$ reactions,
Dalip Singh Verma, Kushmakshi, Pooja Chauhan and Vivek,
International Journal of Modern Physics E, XXXXXXXX, 2022.
3. Enhanced Fission Probability of Even-Z Fragments in the Decay of Hot and Rotating $^{210}\text{Rn}^*$ Compound System,
Dalip Singh Verma, Kushmakshi,
J. Nucl. Phys. Mat. Sci. Rad. A. Vol. **9**, No. 1 (2021), pp.43–46,
<https://doi.org/10.15415/jnp.2021.91008>
4. Investigation of the cold valley paths for the synthesis of isotopes of Ubn in optimum orientations,
Dalip Singh Verma, Kushmakshi,
Nuclear Physics A **1007** (2021) 122129,
<https://doi.org/10.1016/j.nuclphysa.2020.122129>
5. Fission partition a reflection of shell closures: Decay of $^{220,224}\text{U}^*$ at eight excitation energies,

Dalip Singh Verma,

Nuclear Physics A **1003** (2020) 122031.

<https://doi.org/10.1016/j.nuclphysa.2020.122031>

6. Angular momentum as a probe for the reaction mechanism: The $^{88}\text{Mo}^*$ decay at three excitation energies,
Dalip Singh Verma and Kushmakshi,
Nuclear Physics A, 995 (2020) 121690.
<https://doi.org/10.1016/j.nuclphysa.2019.121690>
7. Decay of hot and rotating $^{88}\text{Mo}^*$ at incident energies of 300, 450 and 600 MeV,
Dalip Singh Verma and Kushmakshi,
Physics of Atomic Nuclei, 2020, Vol. **83**, No. 3, pp. 407–417.
<https://doi.org/10.1134/S1063778820030151>
8. Isospin influence on the decay of compound nuclei formed in $^{78,82}\text{Kr} + ^{40}\text{Ca}$ and $^{76,86}\text{Kr} + ^{40,48}\text{Ca}$ reactions,
Dalip Singh Verma, Kushmakshi and Shilpa Rana,
Nuclear Physics A **989** (2019) 117-134.
<https://doi.org/10.1016/j.nuclphysa.2019.06.002>
9. Hot fusion of fission fragments for the synthesis of doubly magic nucleus $^{310}_{126}\text{X}^{184}$,
Dalip Singh Verma and Kushmakshi,
Journal of Radioanalytical and Nuclear Chemistry, Vol. **322**, Issue 1, pp 139–146 (2019).
<https://doi.org/10.1007/s10967-019-06497-7>
10. Sub-barrier fusion cross-sections for $^{32}\text{S} + ^{90,96}\text{Zr}$, using the semiclassical extended Thomas-Fermi approach of Energy Density Formalism,
Dalip Singh Verma,
AIP Conf. Proc. **1524**, 143 (2013);
<https://doi.org/10.1063/1.4801698>
11. Universal functions of nuclear proximity potential for Skyrme nucleus–nucleus interaction in a semiclassical approach,
R. K. Gupta, **Dalip Singh**, Raj Kumar and W. Greiner,
J. Phys. G: Nucl. Part. Phys **36**, 075104 (11pp) 2009.
<https://doi.org/10.1088/0954-3899/36/7/075104>
12. Dynamical Model for the Decay of Hot and Rotating Compound Nucleus,
R. K. Gupta, **Dalip Singh**, S. K. Arun, Niyti and Raj Kumar.
AIP Conference Proceeding Volume 1098, pp. 76-81 (2009).
<https://doi.org/10.1063/1.3108864>
13. Clusters in light, heavy, super-heavy and super-superheavy nuclei
R. K. Gupta, S. K. Arun, **Dalip Singh**, Raj Kumar, Nityi, S. K. Patra, P. Arumugam and B. K. Sharma,
Int. J. Mod. Phys. E, Vol. 17, No. 10 (2008) 2244–2249.
<https://doi.org/10.1142/S0218301308011422>
14. Decay of hot and rotating compound nucleus $^{56}\text{Ni}^*$ using the temperature-dependent energy density formalism
Dalip Singh, S. K. Arun and R.K. Gupta,
Nuclear Structure at the Extremes: New Directions, Narosa Pub. House (2008) ISBN: 978-81-7319-897-7.

15. Semiclassical and microscopic calculations of the spin-orbit density part of the Skyrme nucleus-nucleus interaction potential with temperature effects included, R. K. Gupta, **Dalip Singh** and W. Greiner, Phys. Rev. C **75**, 024603 (2007); <https://doi.org/10.1103/PhysRevC.75.024603>
16. The dynamical cluster-decay model of preformed clusters for a hot and rotating $^{116}\text{Ba}^*$ nucleus produced in the low-energy $^{58}\text{Ni} + ^{58}\text{Ni}$ reaction, R. K. Gupta, M. Balasubramaniam, R. Kumar, **Dalip Singh**, S. K. Arun and W. Greiner, J. Phys. G: Nucl. Part. Phys. **32**, 345 (2006); <https://doi.org/10.1088/0954-3899/32/3/009>
17. Dynamical cluster-decay model for hot and rotating light-mass nuclear systems, applied to the low-energy $^{32}\text{S} + ^{24}\text{Mg} \rightarrow ^{56}\text{Ni}^*$ reaction, R. K. Gupta, M. Balasubramaniam, R. Kumar, **Dalip Singh**, C. Beck and W. Greiner, Phys. Rev. C **71**, 014601 (2005); <https://doi.org/10.1103/PhysRevC.71.014601>
18. Collective clusterization effects in light heavy ions reactions, R. K. Gupta, M. Balasubramaniam, R. Kumar, **Dalip Singh** and C. Beck, Nucl. Phys. A **738**, 479 (2004); <https://doi.org/10.1016/j.nuclphysa.2004.04.091>

Book Chapters

19. Strength of shell closures against excitation energy of a compound nucleus; The decay of $^{314}\text{Ubn}^*$,
Dalip Singh Verma
Proceedings of the DAE Symp. on Nucl. Phys. **65**, 397 (2021).
www.sympnp.org/proceedings
20. Fission partition a reflection of the structure of fission fragments; The decay of $^{229}\text{Am}^*$ excited at 43 MeV,
Dalip Singh Verma and Monika Manhas,
Proceedings of the DAE Symp. on Nucl. Phys. **65**, 411 (2021).
www.sympnp.org/proceedings
21. Compactness based suitability of the target-projectile combinations for the synthesis of $^{310}_{126}\text{X}^{184}$,
Dalip Singh Verma, Shikha Awasthi
Proceedings of the DAE Symp. on Nucl. Phys. **64**, 453(2019).
www.sympnp.org/proceedings
22. Alpha-structured fragments and isospin influence,
Kushmakshi, Anil Khachi, and **Dalip Singh Verma**,
Proceedings of the DAE Symp. on Nucl. Phys. **63**, 702(2018).
www.sympnp.org/proceedings
23. Orientations for hot compact and cold elongated fusion,
Himanshu Sharma and **Dalip Singh Verma**,
Proceedings of the DAE Symp. on Nucl. Phys. **63**, 494(2018).
www.sympnp.org/proceedings
24. Isospin effects on the mass and charge distributions in the decay of $^{118,134}\text{Ba}^*$ compound systems,
Shilpa Rana and **Dalip Singh Verma**,

Proceedings of the DAE Symp. on Nucl. Phys. **63**, 452 (2018).

www.sympnp.org/proceedings

25. Hot fusion of fission fragments for the synthesis of doubly magic nucleus $^{310}_{126}\text{X}^{184}$,
Dalip Singh Verma and Kushmakshi
Proceedings international conference on application of radiotracers and energetic beams in sciences ARCEB-2018, page 273-274.
26. Isospin effects on the decay of $^{118,122,134*}\text{Ba}$ isotopes,
Kushmakshi and **Dalip Singh Verma**,
Proceedings of the DAE Symp. on Nucl. Phys. **62** (2017) 652.
www.sympnp.org/proceedings
27. Orientation effects in the fusion of $^{28}\text{Si}+^{28}\text{Si}$ system using SEDF,
Atul Choudhary and **Dalip Singh Verma**,
Proceedings of the DAE Symp. on Nucl. Phys. **62** (2017) 628.
www.sympnp.org/proceedings
28. Fusion-evaporation and partial fusion-fission events for hot and rotating compound system $^{88}\text{Mo}^*$, Kushmakshi and **Dalip Singh Verma**,
Proceedings of the DAE-BRNS Symp. on Nucl. Phys. **61** (2016) 562.
www.sympnp.org/proceedings
29. Angular momentum effects in the fusion of $^{28}\text{Si}+^{28}\text{Si}$ system,
Atul Choudhary and **Dalip Singh Verma**,
Proceedings of the DAE-BRNS Symp. on Nucl. Phys. **61** (2016) 478.
www.sympnp.org/proceedings
30. Role of surface diffuseness and the coupling of relative motion with intrinsic motion in fusion of negative and positive Q-value systems,
Ankita Jamwal, Shailja Mohini Sharma, Kushmakshi, **Dalip Singh Verma**,
Proceedings of the DAE-BRNS Symp. on Nucl. Phys. **61** (2016) 602.
www.sympnp.org/proceeding.
31. The charged particle decay of hot and rotating compound nucleus $^{118,122}\text{Ba}^*$ using dynamical cluster decay model,
Dalip Singh Verma and Kushmakshi,
Proceedings of the DAE-BRNS Symp. on Nucl. Phys. **60** (2015) 624.
www.sympnp.org/proceedings
32. The fusion excitation function for a positive Q-value system at near and deep sub-barrier energies using Skyrme energy density formalism,
Atul Choudhary and **Dalip Singh Verma**,
Proceedings of the DAE Symp. on Nucl. Phys. **60** (2015) 572.
www.sympnp.org/proceedings
33. Near and sub-barrier fusion for a proton-rich system $^7\text{Be}+^{58}\text{Ni}$ using Skyrme energy density formalism,
Dalip Singh Verma and Atul Choudhary,
Proceedings of the DAE Symp. on Nucl. Phys. **59** (2014) 600.
<http://www.sympnp.org/proceedings>
34. Fusion hindrance investigation for $^{27}\text{Al}+^{45}\text{Sc}$ system using Skyrme energy density formalism,
Dalip Singh Verma and Shivani Thakur,

- Proceedings of the DAE Symp. on Nucl. Phys. **59** (2014) 410.
<http://www.symnp.org/proceedings>
35. Near and sub-barrier fusion cross-sections for neutron-rich system $^{20}\text{O} + ^{12}\text{C}$; using Skyrme energy density formalism,
Dalip Singh Verma,
Proceedings of the DAE Symp. on Nucl. Phys. **58** (2013) 476.
<http://www.symnp.org/proceedings>
36. Fusion excitation functions for $^{32}\text{S} + ^{90}\text{Zr}$ near sub-barrier energies with Ecm-dependent nuclear surface thickness,
Dalip Singh Verma,
Proceedings of the DAE Symp. on Nucl. Phys. **57** (2012) 446.
<http://www.symnp.org/proceedings>
37. Heavy ion reactions using universal function of Energy Density Formalism in semiclassical approach,
Dalip Singh,
Proceedings of the DAE Symp. on Nucl. Phys. **56** (2011) 502.
<http://www.symnp.org/proceedings>
38. Applications of Skyrme parameterized universal function of nuclear proximity in dynamical cluster decay model,
Dalip Singh,
Proceedings of the DAE Symp. on Nucl. Phys., **56** (2011) 558.
<http://www.symnp.org/proceedings>
39. Fusion cross-sections for $^{64}\text{Ni} + ^{64}\text{Ni}$ reaction at sub-barrier energies using the semiclassical formulation of Skyrme energy density functional,
Raj Kumar, **Dalip Singh** and R. K. Gupta,
Proceedings of the DAE Symp. on Nucl. Phys., **51**, 405 (2007).
https://inis.iaea.org/search/search.aspx?orig_q=RN:39044200
40. Fusion cross-sections using the semiclassical approach to energy density formalism,
Dalip Singh and Raj K. Gupta
Proceedings of the DAE Symp. on Nucl. Phys., **51**, 429 (2006).
https://inis.iaea.org/search/search.aspx?orig_q=RN:38081181
41. Emission of Carbon nuclei from $^{56}\text{Ni}^*$ formed in $^{32}\text{S} + ^{24}\text{Mg}$ reaction.
Dalip Singh and Raj K. Gupta
Proceedings of the DAE Symp. on Nucl. Phys., **50B**, 331(2005).
https://inis.iaea.org/search/search.aspx?orig_q=RN:37096240
42. Decay of hot and rotating compound nuclei using energy density formalism.
Dalip Singh, S. K. Arun and R.K. Gupta,
Int. Workshop on "Nuclear Structure at the Extremes: New directions", March 21-24, 2005, H.P.U. Shimla, (India).
43. Entrance channel effects using the dynamical cluster-decay model: Decay of $^{48}\text{Cr}^*$.
M. K. Sharma, B. B. Singh, **Dalip Singh** and R.K. Gupta,
Proceedings of the DAE Symp. on Nucl. Phys., **47B** (2004) 276.
https://inis.iaea.org/search/search.aspx?orig_q=RN:36046987
44. Hauser Feshbach statistical model versus dynamical cluster-decay model for hot and rotating $^{116}\text{Ba}^*$.
Dalip Singh, S.K. Arun, M. Balasubramaniam and R.K. Gupta,

- Proceedings of the DAE Symp. on Nucl. Phys., **47B** (2004) 214.
https://inis.iaea.org/search/search.aspx?orig_q=RN:36046956
45. Dynamical cluster-decay model for hot and rotating $^{116}\text{Ba}^*$.
 R. Kumar, M. Balasubramaniam, **Dalip Singh** and R. K. Gupta,
 Proceedings of the DAE Symp. on Nucl. Phys., **46B** (2003) 252.
https://inis.iaea.org/search/search.aspx?orig_q=RN:36091360
46. Role of temperature in spin-orbit density part of the interaction potential.
Dalip Singh and R. K. Gupta,
 Proceedings of the DAE Symp. On Nucl. Phys., **46B**, (2003) 254.
https://inis.iaea.org/search/search.aspx?orig_q=RN:36091361

Other Refereed Contributions: letters, reviews, editorials, notes and commentaries

47. Collective clusterization effects in light heavy ion reactions.
 R.K. Gupta, M. Balasubramaniam, R. Kumar, **Dalip Singh** and C. Beck,
 Contribution, The 8th International Conference on Clustering Aspects of Nuclear
 Structure and Dynamics, 24-29 November 2003, Nara, Japan.
48. Dynamical collective clusterization in hot and rotating nuclei.
 R.K. Gupta, M. Balasubramaniam, R. Kumar, **Dalip Singh**, C. Beck and W. Greiner,
 Contribution to International Conference on Nuclear Data for Science & Technology,
 Santa Fe, New Mexico, USA, Sept. 26 - Oct. 1, 2004.
49. A non-statistical dynamical description of the hot and rotating compound nucleus,
Dalip Singh M. Manhas, S. K. Arun, R. Kumar, N. Sharma and R. K. Gupta,
 1st Chandigarh Science Congress, PU, Chandigarh. (India), (2007) page 225.
50. Fusion Cross-sections for Light and Super-heavy Systems using Proximity Solution
 of Nucleus-nucleus Interaction Potential in Semiclassical Approach,
Dalip Singh and R. K. Gupta,
 2nd International Conference on Frontiers in Nuclear Structure, Astrophysics and
 Reactions, Aghios Nikolaos, Crete, Greece, September 10-14, 2007.
51. Reaction dynamics of light, heavy and super heavy nuclei using dynamical cluster-
 decay model.
 Monika Manhas, **Dalip Singh**, Sham K. Arun, Raj Kumar, Niyti, and Raj K. Gupta,
 11th Punjab Science congress, Feb 7-9, 2008, Thapar University, Patiala, BC-27, page
 30.
52. Role of moment of inertia and of limiting angular momentum in heavy ion collisions,
 Raj Kumar, **Dalip Singh**, Niyti Sharma and Raj K. Gupta,
 2nd Chandigarh Science Congress, Panjab University, Chandigarh. (India) 2008.
53. Dynamical Model for the decay of hot and rotating compound nucleus,
 R. K. Gupta, **Dalip Singh**, Raj Kumar and Niyti Sharma,
 International Conference on New Aspects of Heavy Ion Collisions Near the Coulomb
 Barrier, September 22-26, 2008, Chicago, USA.
54. Isospin effects in decay of $^{116-122}\text{Ba}^*$ nuclei,
 R. K. Gupta, **Dalip Singh**, Sham K. Arun and Raj Kumar,
 5th International conference on Exotic Nuclei and Atomic masses, September 07-13,
 2008, Ryn, Poland (ENAM08).

Participations in Seminars/Conferences/workshops etc.

1. Organising secretary, Online International Conference on Recent Trends in Nuclear Physics, February 16-18, 2022.
2. 65th DAE-BRNS Symposium on Nuclear Physics, 2021, December 1-5.
3. Orientation Programme “Nuclear Isomerism: Commemorating the centenary of discovery” on November 30, 2021, in the “65th DAE-BRNS Symposium on Nuclear Physics (SNP2021)”.
4. Organising secretary, Online International Conference on Theoretical Aspects of Nuclear Physics, February 15-20, 2021.
5. Online International Conference on Theoretical Aspects of Nuclear Physics, February 15-20, 2021.
6. Young scientists’ Conference organised during 22-12-2020 to 24-12-2020 as a part of India International Science Festival 2020 (as Jury member).
7. Webinar on “Particle Detectors and Applications” organized by the Post Graduate Department of Physics on June 26, 2020.
8. Publishing ethics: Role of Publishers, Journals, Researchers and Institutions, organised by Springer Nature in collaboration with infolibnet center on 25th June, 2020.
9. One Week Faculty Development Programme on "Open Source Tools for Research" from June 08 - June 14, 2020
10. Two-Week Faculty Development Programme on “Managing Online Classes & Co-creating MOOCS 2.0” from *May 18 - June 03, 2020*
11. Two days workshop on “**Indian Mathematics**” organized by Department of Mathematics, CUHP, during September 13-14, 2019.
12. National Workshop on “**In Silico Approach for Modelling New Materials: Methodology & Applications**” organized by DPAS, CUHP during 14th – 20th January, 2019.
13. Resource Person for the Project evaluation in **26th state level Himachal Pradesh Children Science Congress-2018**, during 9th – 12th October, 2018.
14. XXII National Symposium (NSU-2017) on “**Advances in Ultrasonics and Materials Research**”, held during November 8-10, 2017, organised by Department of Physics and Astronomical Science and Ultrasonic Society of India.
15. School on “**Gravitation and Astroparticle Physics**”, organized by CUHP and IUCAA, Pune, from 29-02-2016 to 12-03-2016.

16. Three days workshop on **“Computerisation Experiments in Physics”** organized jointly by CUHP and IUAC, New Delhi, from 17th to 19th March, 2016.
17. One Week Faculty Development Programme on **“Emerging Trends of ICT in Higher Education”** from 9th -15th June, 2016.
18. Two day workshop on **“Experimental Physics”** held during 4th to 5th April, 2016 at Department of Physics and Astronomical Science, CUHP.
19. Two days workshop on **“Recent Trends in Modern Materials”**, organised by Department of Physics and Astronomical Science, CUHP during March 11-12, 2015.
20. National Conference on **“Emerging Challenges in Physics & Nano Science”**, during 4th March, 2015 at DAV College Dasuya, District Hoshiarpur Punjab (**Invited talk**).
21. Two days International Conference on **“Emerging Trends in Basic and Applied Sciences”** held during May 1-2, 2015, at MAU, Baddi, (H.P.)-India.
22. Invited talk on **“Scientific typesetting software ‘Latex for Publications’** in One day workshop on scientific writing and presentation on 20th March, 2015 at CUHP.
23. Organised Three day workshop on **“Physics Experiments Using Data Acquisition Kit EXPEYES”** during 6th to 8th November, 2014 at CUHP.
24. One week Workshop on **“Analytical Aspects of Dynamics”**, held during 11th November, 2014 to 17th November, 2014 at CUHP.
25. One day National Workshop on **“Astronomy & Astrophysics”** jointly organized by NSCBM Govt. Post Graduate College Hamirpur (H.P.) and Inter-University Center for Astrophysics, Pune, Pune University, Maharashtra held on 15th October, 2012.
26. International Conference on **“Recent Trends in Nuclear Physics”**, held 19-21st Nov, 2012 at CITTARA University Himachal Pradesh.
27. National workshop on **“Mathematica: An integrated Environment for Computer Simulation in Physics and Mathematics”** held on 28th -30th July, 2011 at Chitkara University, Himachal Pradesh.
28. DAE-BRNS Nuclear Physics Symposium held at Andhra University, Visakhapatnam, during December 26-30, 2011.
29. 11th Punjab Science congress, at Thapar University, Patiala, Feb 7-9, 2008.
30. Diamond Jubilee National Seminar on **Advances in Physics**, Feb 28-March 1, 2008, Department of Physics, Panjab University, Chandigarh.