

## CURRICULUM VITAE

### **Dr. Virender Thakur**

*MSc, MPhil, DST-JRF/SRF, GATE, SET & PhD*  
*Assistant Professor*  
*Department of Physics*  
*Govt. College Karsog, District Mandi*  
*Himachal Pradesh-175011 (India)*



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### **Teaching/Research Experience**

- MPhil    ■ Joined **MPhil Physics** research in 2016 and passed the examination for MPhil degree in 2017.
- PhD      ■ Joined **PhD Physics** research as **JRF** from 01.12.2017 to 30.11.2019 and as **SRF** from 01.12.2019 to 30.11.2022. Successfully defended PhD on 31.12.2022.
- Assistant Professor  
in Physics    ■ Joined **College Cadre** as an **Assistant Professor in Physics** from 07.07.2023 to till date.

### **Additional Charge (NCC/NSS/R&R/others) in Govt. College Karsog**

- Member of IQAC/ UGC Committee.
- Member of NSS.
- Member of Save Energy Club.
- Member of HPU/SPU Youth Festivals/ Cultural Committee (Group-1).
- Member of Career Counselling Cell.
- Member of Disaster Management Cell.

### **Membership (if any)**

- Member of Himachal Government College Teachers' Association (HGCTA).

## Education

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- 1999 – 2004     Govt. Primary School Kanda, Teh Karsog, Distt. Mandi, Himachal Pradesh, INDIA -175011 (**Primary Education**).
- 2004 – 2009     Govt. High School Kunhoo, Teh Karsog, Distt. Mandi, Himachal Pradesh, INDIA -175011 (**Matriculation Education**).
- 2009 – 2011     Govt. Senior Secondary School Karsog, Teh Karsog, Distt. Mandi, Himachal Pradesh, INDIA -175011 (**Senior Secondary Education in Science Non-Medical stream**).
- 2011 – 2014     Govt. College Karsog, Teh Karsog, Distt. Mandi, Himachal Pradesh, INDIA -175011 (**BSc Non-Medical**).
- 2014 – 2016     Himachal Pradesh University, Summer Hill, Shimla-5, Himachal Pradesh, INDIA -171005 (**MSc Physics**).
- 2016 – 2017     Himachal Pradesh University, Summer Hill, Shimla-5, Himachal Pradesh, INDIA -171005 (**M.Phil. Physics**).
- 2017 – 2022     Himachal Pradesh University, Summer Hill, Shimla-5, Himachal Pradesh, INDIA -171005 (**Ph.D. in Theoretical Nuclear Structure and Astro Physics**).


## Award(s)/Achievement(s)

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-  Recipient of **Certificate of Merit** for being in top 100 of all candidates appeared in Himachal Pradesh Board of School Education (Matriculation Examination) 2009.
-  Participated in Programme for International Student Assessment (PISA) managed by **NCERT** and **ACER** (Australian Council for Education Research).
-  Recipient of **Certificate of Merit** for being in top 100 of all candidates appeared in Himachal Pradesh Board of School Education (Senior Secondary Examination) 2011.
-  Department of Science & Technology (Govt. of India) **Junior Research Fellowship (JRF)** from 2017-2019.
-  Department of Science & Technology (Govt. of India) **Senior Research Fellowship (SRF)** from 2019-2022.
-  Qualified **SET [Ref. No. F. 7-12/2015 (NET/SET) Dated : 14-06-2017]** for Eligibility of Lectureship in the State Universities / Colleges.
-  Qualified Graduate Aptitude Test in Engineering (**GATE**), national examination on the comprehensive understanding of the candidates in post-graduate level physics.
-  **“International Best Researcher Award”** in “Nuclear Structure and Nuclear Astrophysics” by “International Society for Scientific Network (ISSN) - 2022”.
-  Secured **First Rank** in the merit list for the post of Assistant Professor (College Cadre) in Physics in the Department of Higher Education, H.P. conducted by Himachal Pradesh Public Service Commission (HPPSC).

## Research Interests

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-  To Carry out front line basic science research in the thrust areas of scientific activities in theoretical hadron physics and nuclear structure and astrophysics.

## Research Interests (continued)

- The main research interests are focused on nuclear structure studies of exotic nuclei and the equations of state of dense matter at high densities regime. In case of nuclear structure studies, I am working for understanding of structural properties within the framework of mean field approximations.
- Our goal is to develop new theoretical framework to study the phases of quark matter in the interior of compact stars, where the composition of compact stars varies from baryons to quarks matter in beta equilibrium. The resulting equations of state in conjunction with General Relativity can be employed to study the static and rapid rotation of compact stars and Tidal Deformability in compact stars. These studies are relevant to the experiments that are planned at modern nuclear physics facilities and observatories of astrophysical interest.

## Research Publications

### Journal Articles

- 1 M. Kumar, S. Kumar, **V. Thakur**, R. Kumar, B. K. Agrawal, and S. K. Dhiman, "Crest- and prex-ii-motivated relativistic interactions and their implications for the bulk properties of nuclear matter and neutron stars," *Phys. Rev. C*, vol. 107, p. 055 801, 5 May 2023. [DOI: 10.1103/PhysRevC.107.055801](#).
- 2 R. Kumar, M. Kumar, **V. Thakur**, *et al.*, "Observational constraint from the heaviest pulsar psr j0952-0607 on the equation of state of dense matter in relativistic mean field model," *Phys. Rev. C*, vol. 107, p. 055 805, 5 May 2023. [DOI: 10.1103/PhysRevC.107.055805](#).
- 3 **V. Thakur**, R. Kumar, P. Kumar, *et al.*, "Relativistic approach for the determination of nuclear and neutron star properties in consideration of prex-ii results," *Phys. Rev. C*, vol. 107, p. 015 803, 1 Jan. 2023. [DOI: 10.1103/PhysRevC.107.015803](#).
- 4 P. Kumar, **V. Thakur**, S. Thakur, *et al.*, "Effect of nuclear deformation on proton bubble structure in z=14 isotopes," *The European Physical Journal A*, vol. 58, no. 8, pp. 1–10, 2022.
- 5 V. Kumar, P. Kumar, **V. Thakur**, S. Thakur, and S. K. Dhiman, "The microscopic studies of the even-even 12- 280, 34- 60ca, 48- 80ni, and 100- 134sn using covariant density functional theory," *Nuclear Physics A*, vol. 1022, p. 122 429, 2022.
- 6 S. Thakur, **V. Thakur**, R. Kumar, and S. K. Dhiman, "Structural properties of rotating hybrid compact stars with color-flavor-locked quark matter core and their tidal deformability," *The European Physical Journal A*, vol. 58, no. 5, pp. 1–22, 2022.
- 7 **V. Thakur**, P. Kumar, V. Kumar, *et al.*, "Rmf-based microscopic study of ground-state properties and nuclear shape transitions in even-even po isotopes," *Acta Physica Polonica B*, vol. 53, no. 2, 2022.
- 8 **V. Thakur**, R. Kumar, P. Kumar, V. Kumar, B. Agrawal, and S. K. Dhiman, "Relativistic mean field model parametrizations in the light of gw170817, gw190814, and psr j 0740+ 6620," *Physical Review C*, vol. 106, no. 2, p. 025 803, 2022.
- 9 **V. Thakur**, R. Kumar, P. Kumar, *et al.*, "Effects of an isovector scalar meson on the equation of state of dense matter within a relativistic mean field model," *Physical Review C*, vol. 106, no. 4, p. 045 806, 2022.
- 10 P. Kumar, **V. Thakur**, and S. K. Dhiman, "A study of shape transition and bubbleness in ne isotopes," *HNPS Advances in Nuclear Physics*, vol. 28, pp. 14–21, 2021.
- 11 P. Kumar, **V. Thakur**, and S. K. Dhiman, "Impact of nuclear deformation on neutron dripline prediction: A study of mg isotopes," *Journal of Nuclear Physics, Material Sciences, Radiation and Applications*, vol. 9, no. 1, pp. 19–23, 2021.

- 12 P. Kumar, **V. Thakur**, and S. K. Dhiman, "Impact of nuclear deformation on neutron dripline prediction: A study of mg isotopes," *Journal of Nuclear Physics, Material Sciences, Radiation and Applications*, vol. 9, no. 1, pp. 19–23, 2021.
- 13 P. Kumar, **V. Thakur**, V. Kumar, and S. K. Dhiman, "Possibility of deformed dual bubble-like structure in light nuclei," *The European Physical Journal Plus*, vol. 136, no. 10, pp. 1–11, 2021.
- 14 P. Kumar, **V. Thakur**, S. Thakur, V. Kumar, and S. K. Dhiman, "Evolution of nuclear shapes in light nuclei from proton-to neutron-rich side.," *Acta Physica Polonica B*, vol. 52, no. 5, 2021.
- 15 P. Kumar, **V. Thakur**, S. Thakur, V. Kumar, and S. K. Dhiman, "Nuclear shape evolution and shape coexistence in zr and mo isotopes," *The European Physical Journal A*, vol. 57, no. 1, pp. 1–13, 2021.
- 16 V. Kumar, P. Kumar, **V. Thakur**, S. Thakur, and S. K. Dhiman, "Microscopic study of shape evolution and some important ground state properties of 190–210au isotopes," *International Journal of Modern Physics E*, vol. 30, no. 06, p. 2150049, 2021.
- 17 S. Thakur, P. Kumar, **V. Thakur**, V. Kumar, and S. K. Dhiman, "Nuclear shape evolution in palladium isotopes.," *Acta Physica Polonica B*, vol. 52, no. 12, 2021.
- 18 S. Thakur, P. Kumar, **V. Thakur**, V. Kumar, and S. K. Dhiman, "Shape transitions and shell structure study in zirconium, molybdenum and ruthenium," *Nuclear Physics A*, vol. 1014, p. 122254, 2021.
- 19 V. Kumar, P. Kumar, **V. Thakur**, S. Thakur, and S. K. Dhiman, "Microscopic study of shape evolution and ground-state properties of iodine isotopes," *Physica Scripta*, vol. 96, no. 2, p. 025301, 2020.
- 20 **V. Thakur**, P. Kumar, S. Thakur, S. Thakur, V. Kumar, and S. K. Dhiman, "Microscopic study of the shell structure evolution in isotopes of light to middle mass range nuclides," *Nuclear Physics A*, vol. 1002, p. 121981, 2020.
- 21 **V. Thakur** and S. K. Dhiman, "A study of charge radii and neutron skin thickness near nuclear drip lines," *Nuclear Physics A*, vol. 992, p. 121623, 2019.

## Conference Proceedings

- 1 **V. Thakur**, R. Kumar, P. Kumar, and S. K. Dhiman, "Nuclear and neutron star properties within the prex-ii motivated parameterization of relativistic mean field model," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 66, 2022, p. 796.
- 2 **V. Thakur**, R. Kumar, P. Kumar, and S. K. Dhiman, "Study of even-even lead (pb) isotopes based on covariant density functional theory," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 66, 2022, p. 294.
- 3 P. Kumar, **V. Thakur**, V. Kumar, *et al.*, "Bubble structure in n= 28 isotones," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 65, 2021, p. 166.
- 4 P. Kumar, **V. Thakur**, V. Kumar, *et al.*, "Reduction of n= 28 shell gap in light neutron-rich nuclei," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 65, 2021, p. 180.
- 5 V. Kumar, P. Kumar, **V. Thakur**, *et al.*, "The study of nuclear structure properties of neutron-rich even-even 200–216 hg isotopes," in *Proceedings of the DAE-BRNS symposium on nuclear physics. V. 65*, 2021.
- 6 **V. Thakur**, P. Kumar, V. Kumar, S. Thakur, R. Kumar, and S. K. Dhiman, "Microscopic study of binding energies in odd-mass exotic isotopes within rhb and hfb formalism," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 65, 2021, p. 148.
- 7 **V. Thakur**, P. Kumar, V. Kumar, S. Thakur, R. Kumar, and S. K. Dhiman, "Microscopic study of binding energies in odd-mass exotic isotopes within rhb and hfb formalism," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 65, 2021, p. 148.

- 8 **V. Thakur**, P. Kumar, V. Kumar, S. Thakur, R. Kumar, and S. K. Dhiman, "Single-neutron and two-neutron separation energies in odd-a nuclides of ar and ca," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 65, 2021, p. 150.
- 9 S. Thakur, **V. Thakur**, and S. K. Dhiman, "A study of charge radii in si, s, ar and ca nuclides within relativistic hartree-fock-bogoliubov approximation," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 63, 2018, p. 256.
- 10 S. Thakur, **V. Thakur**, and S. K. Dhiman, "Rmf model based investigation of two neutron separation energies for middle weight nuclides near drip lines," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 63, 2018, p. 334.
- 11 S. Thakur, **V. Thakur**, and S. K. Dhiman, "Rotating hadron stars under strong magnetic fields," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 63, 2018, p. 780.
- 12 S. Thakur, **V. Thakur**, and S. K. Dhiman, "Structural properties of rotating hybrid stars with color-superconducting quarks matter," in *Proceedings of the DAE Symp. on Nucl. Phys*, vol. 63, 2018, p. 782.
- 13 **V. Thakur**, S. Thakur, S. Thakur, and S. K. Dhiman, "An investigation of binding energy for even-even exotic isotopes within skyrme-hartree-fock-bogoliubov formalism," in *Proceedings of the DAE international symposium on nuclear physics. V. 63*, 2018.
- 14 **V. Thakur**, S. Thakur, S. Thakur, and S. K. Dhiman, "An investigation of binding energy for even-even exotic isotopes within skyrme-hartree-fock-bogoliubov formalism," in *Proceedings of the DAE international symposium on nuclear physics. V. 63*, 2018.

## Refereed for Journal(s) or available as referee/reviewer for Journal(s)

- 📖 Indian Journal of Physics.
- 📖 Nuclear Physics A.
- 📖 European Physical Journal A.
- 📖 Physical Review C.

## International/National Conference/Workshop/Symposiums Attended

- 2018 📖 National Conference on focal theme "REACHING THE UNREACHED THROUGH SCIENCE AND TECHNOLOGY", organised by Indian Science Congress Association SHIMLA CHAPTER and Himachal Pradesh University, NAAC Accredited "A" Grade University, Summer Hill Shimla -171005 (30th - 31st March, 2018).
- 📖 63<sup>rd</sup> DAE International Symposium on Nuclear Physics, Dec. 9-14, 2018 at BARC, Anushakti Nagar, Mumbai, India.
- 2019 📖 International Conference on Electron Microscopy and Allied Analytical Techniques (EMAAT - 2019), June 7-9, 2019, Shimla, Himachal Pradesh (India).
- 📖 International Workshop on Electron Microscopy and Allied Analytical Techniques (EMAAT - 2019), June 5-6, 2019, Shimla, Himachal Pradesh (India).
- 2021 📖 29<sup>th</sup> Symposium of the Hellenic Nuclear Physics Society, held in hybrid mode on September 24-25 at the National Center for Scientific Research "Demokritos", Greece.

## International/National Conference/Workshop/Symposiums Attended (continued)

- 65<sup>th</sup> DAE Symposium on Nuclear Physics, Dec 1-5, 2021 at BARC, Anushakti Nagar, Mumbai, India.

## International/National Schools Attended

- 2019 **“SERB School on Nuclear Astrophysics”** February 11 - March 2, 2019, Saha Institute of Nuclear Physics, Kolkata, India.
- “Ph.D. Course Module: Nuclear Models-II”** March 25 - April 19, 2019, Inter University Accelerator Center, New Delhi, India.
- International Conference on Electron Microscopy and Allied Analytical Techniques (EMAAT - 2019), June 7-9, 2019, Shimla, Himachal Pradesh (India).
- “Short Term Course on Emerging Fields in High Energy Physics”** July 15-19, 2019, National Institute of Technology, Jalandhar, Punjab, India.

## Skills

- Languages **Hindi (Mother Tongue)** and Strong reading, writing and speaking competencies for English.
- Coding I am efficient in working with Fortran, Python, C, C++ and  $\text{\LaTeX}$ .
- Teaching Teaching of M.Sc. Classes, Taking lab duties of M.Sc. Students, Supervision of M.Sc. Students in their project under the guidance of the Supervisor and To guide M.Phil. Students in their course under the Supervisor (during PhD).
- Misc. Academic research, plotting in Xmgrace and plotting in Origin.

## Miscellaneous Information

### Co-Curricular/Leadership/Administrative Activities

- 2009 **Active member of Scouts and Guides.**
- 2010–2011 **Active member of NSS (National Service Scheme).**
- 2013–2014 **CSCA President (elected)** in Govt. College Karsog.  
**President** of science club in Govt. College Karsog.  
**Editor** of science section of Kamaksha magazine in Govt. College Karsog.  
**Winner of Debate competition** at Inter College level Youth Festival.
- 2021-2022 **Prefect** of Tagore Boys Hostel, Himachal Pradesh University, Summerhill, Shimla-5.

### Other

- Sex **Male.**
- Religion **Hindu.**
- Current Address **Department of Physics, Govt. College Karsog, Tehsil Karsog, District Mandi, State Himachal Pradesh, Country India, Pin Code 175011.**
- Permanent Address **Village Kanda, Post Office Kunhoo, Tehsil Karsog, District Mandi, State Himachal Pradesh, Country India, Pin Code 175011.**

## References

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## Declaration

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I hereby solemnly declare that all the statements made above are true and correct to the best of my knowledge.

**Signature:** Virender Thakur

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