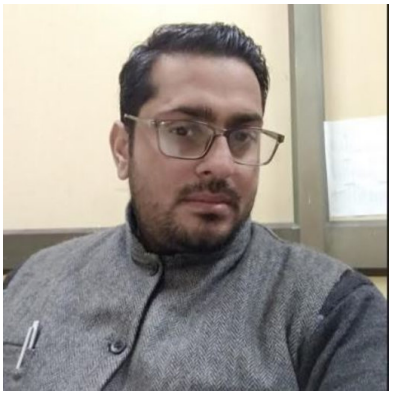
Dr. Surender Pratap



PERSONAL DETAILS

Address School of Physical and Material Sciences, Department of Physics and Astronomical Sciences Academic Block Shahpur, Distt. Kangra, Himachal Pradesh, Pincode-176206
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ACADEMIC QUALIFICATIONS

Ph.D in Theoretical Condensed Matter Physics 2011-2017
Birla Institute of Technology & Science(Pilani), Rajasthan(India)
Supervisor: Dr. Niladri Sarkar
Thesis Title: Study of Low Dimensional Systems with NEGF & RMT Approach.

M.Sc in Theoretical Physics 2007-2009
Department of Physics Jamia Millia Islamia(New Delhi), India

B.Sc General Physics 2003-2006
Vallabh Govt. College Mandi(HPU), India

COMPETITIVE EXAM

Joint Entrance for screening test(JEST-2010)

AWARD

Second Position in lecture competition conducted by Department of Physics, Jamia Millia Islamia, New Delhi-110025.

FACULTY DEVELOPMENT PROGRAMME ORGANISED BY IIT MADRAS

Successfully Completed

RESEARCH ASSOCIATE

Postdoc fellow in School of Physical Sciences, National Institute of Science Education and Research (Bhubaneswar) 2017(February)

ORIENTATION PROGRAMME

TLC Ramanujan College Delhi University(June 04 - July 01, 2020.)

SHORT TERM COURSE ON CURRENT TRENDS IN CONDENSED MATTER PHYSICS, ORGANISED BY NIT JALANDHAR

25.09.2020-29.09.2020

PUBLICATIONS

[1] Bhalla, P. and **Surender Pratap**. (2018). Aspects of electron transport in zigzag graphene nanoribbons. *International Journal of Modern Physics B*, 32(12):1850148.

[2] Kumar, S. and Pratap, S. (2023). A comparative study of carbon-based nanoribbons and mos2-based nanoribbons for spintronics-based devices. In *Advances in Flexible and Printed Electronics*, 2053-2563, pages 4–1 to 4–28. IOP Publishing.

[3] kumar, S., Pratap, S., Joshi, N., Trivedi, R., Rout, C. S., and Chakraborty, B. (2023). Recent development of two-dimensional tantalum dichalcogenides and their applications. *Micro and Nanostructures*, 181:207627.

[4] Kumar, S., Pratap, S., Kumar, V., Mishra, R. K., Gwag, J. S., and Chakraborty, B. (2023). Electronic, transport, magnetic, and optical properties of graphene nanoribbons and their optical sensing applications: A comprehensive review. *Luminescence*, 38(7):909–953.

[5] Kumar, S., Saklani, R., Bhavya, Pratap, S., and Bhalla, P. (2024). Effects of vacancies on quantum transport of zigzag graphene nanoribbons. *Physica Scripta*, 99(6):065944.

[6] Kumar, V., Pratap, S., and Chakraborty, B. (2025). 2d biphenylene: exciting properties, synthesis amp; applications. *Journal of Physics: Condensed Matter*, 37(11):113006.

[7] Kumari, S., Kumar, S., Pratap, S., and Kubakaddi, S. S. (2024). Ab-initio transport model to study the thermoelectric performance of mos2, mose2, and ws2 monolayers by using boltzmann transport equation. *Journal of Physics: Condensed Matter*, 36(31):315501.

[8] Kumari, S. and Pratap, S. (2023). Effect of intrinsic amp; rashba spin-orbit interactions (soi) in case of bilayer graphene. *Journal of Physics: Conference Series*, 2663(1):012032.

[9] **Surender Pratap** (2016). Transport properties of zigzag graphene nanoribbons in the confined region of potential well,. *Superlattices and Microstructures*, 100.

[10] **Surender Pratap** (2017). Transmission and local density of states in case of zigzag graphene nanoribbons with and without magnetic field. *Superlattices and Microstructures*, 104(1):540 – 546.

[11] **Surender Pratap** (2020). Edge states in zigzag graphene nanoribbons in a finite potential well. *AIP Conference Proceedings*, 2220(1):100011.

[12] **Surender Pratap**, Kumar, S., and Singh, R. P. (2022). Certain aspects of quantum transport in zigzag graphene nanoribbons. *Frontiers in Physics*, 10.

[13] **Surender Pratap** and Kumar, V. (2021). Dirac fermions in zigzag graphene nanoribbon in a finite potential well. *Physica B: Condensed Matter*, 614:412916.

[14] **Surender Pratap** and Sarkar, N. (2015). Application of the self-consistent quantum method for simulating the size quantization effect in the channel of a nano-scale dual gate mosfet. *AIP Conference Proceedings*, 1665(1):120036.

[15] **Surender Pratap** and Sarkar., N. (2016). Application of a self-consistent negf procedure to study the coherent transport with phase breaking scattering in low dimensional systems. *AIP Conference Proceedings*, 1724(1):020096.

[16] **Surender Pratap** and Sarkar, N. (2016). Studying the conductance and transport in low-dimensional graphene nano ribbon under ballistic regime. *AIP Conference Proceedings*, 1728:020267.

[17] **Surender Pratap** and Sarkar, N. (2019). Transport properties and sub-band modulation of the swcnt based nano-scale transistors. In Sharma, R. K. and Rawal, D., editors, *The Physics of Semiconductor Devices*, pages 155–162, Cham. Springer International Publishing.

[18] **Surender Pratap** and Sarkar, N. (2020). Application of the density matrix formalism for obtaining the channel density of a dual gate nano-scale ultra thin mosfet and its comparison with the semi-classical approach. *International Journal of Nanoscience (World scientific)*, 19.

[19] Tshipa, M., L. K. S. . **Surender Pratap**. (2021). Photoionization cross-section in a gaas spherical quantum shell: the effect of parabolic confining electric potentials. *EPJB*, 94:129.

[20] Vinod Kumar, Surender Pratap, T. M. M. M. (2024). Optical transition rates of a polar quantum disc with conical disclination in a magnetic field: effects of some forms of the electric potential. *EPJ Plus*, 139.

TEACHING

Assistant Professor Department of Physics, CT University
Department of Physics(Punjab) INDIA
August 2017 - 31 July, 2018.

Assistant Professor School of Physics, Shri Mata Vaishno Devi University, Katra
Jammu & Kashmir(INDIA)
August 2018 - January 14, 2020

Assistant Professor Central University of Himachal Pradesh
Dharamshala(Kangra), INDIA
Jan 15, 2020- till now

COURSES TAUGHT

- **Solid State Physics**
- **Nuclear and particle Physics**
- **Quantum Mechanics**
- **Classical Mechanics**
- **Electricity and Magnetism**
- Lab instructor for B.tech and M.Sc Physics lab(SMVDU)
- **Classical Dynamics**
- **Mathematical Physics**

- **Classical Electrodynamics**
- **Mesoscopic Physics**
- **Advanced Condensed Matter Physics**
- **Condensed Matter Physics**
- **Statistical Physics**
- **Advanced Quantum Mechanics**

INVITED TALKS

Physical Research Laboratory (PRL), Ahmedabad(INDIA)
Quantum Transport in the confined region of potential well and quantum chaos in 1-dim disordered systems
April 27, 2017.

IISER, BHOPAL

IISER Bhopal(India)
Quantum transport in the confined well & Level spacing distribution.
November 10, 2017.

IOP, BHUBANESWAR

Quantum transport in the confined region of potential well and quantum disordered wire case
June 25, 2018.

SMVDU, KATRA

Phase breaking processes in case of Zigzag & armchair nanoribbons.
October 26, 2018

GDC, BUDGAM, KASHMIR, J&K, INDIA

Fano factor & Conductivity in the confined region of the potential well.
January 11-12, 2021
Participation in Seminars/Conferences

- DAE symposium held at VIT Chenai-2014.
- Indo US Symposium held at IIT Kanpur.
- Spintronics in 2-Dim. materials conducted by IIT Bombay.

Faculty Development Programme and others

- ATAL FDP on Research Methodology, IIIT Dharwad (December 7- 11, 2020).
- ATAL FDP on Research Methodology, IIIT Nagpur (December 1-5, 2020).
- FDP on Managing Virtual Classrooms and Open Educational resources, Panjab University Chandigarh(June 24-29,2020).

- Solid state physics in Quarantine, ICTP(Italy) online mode 16 Apr-29 May 2020.
- Attended online conference on 2D Materials for Spin-Orbitronics by the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste from 03 May 2021 to 05 May 2021.
- Attended online Classical and Quantum transport Processes : Current State and Future Directions (ONLINE) from 17 January 2022 to 28 January 2022(ICTS Banglore).
- Introduction To Quantum Physics and Its Applications by Indian Institute of Technology Bombay From 1st Dec 2020 to 31st March 2021.
- Attended APCTP-IACS-SNBNCBS Workshop on Computational Methods for Emergent Quantum Matter: From Theoretical Concepts to Experimental Realization from 17 November 2022 - 25 November 2022, S.N. Bose National Center For Basic Sciences, Kolkata & Indian Association for the Cultivation of Science, Kolkata.
- Attended online Condensed Matter meets Quantum Information 25 September 2023 to 06 October 2023 (ICTS Banglore).
- Attended and successfully completed organised by IUCAA Pune NEP Orientation and Sensitization Programme held from 1st to 9th Febraury 2024.
- Attended and sucessfully completed Topical School of Advanced Condensed Matter Physics (offline mode) organised by IOP Bhubaneswar from May 20th - 31st, 2024.
- Attended and successfully completed organised by IUCAA Pune NEP Orientation and Sensitization Programme held from 1st to 15th July 2024.

CODING AND HIGH PERFORMANCE COMPUTING

Linux	Advanced
Matlab	Proficient
High Performance Computing	Proficient
Mathematica	Proficient

PH.D SUPERVISING

Currently three students are enrolled

M.SC PROJECT SUPERVISION

Sahil Sharma (17MPY027) & Shivani Sharma (17MPY032) Dec 2018 - May 2019

Phase coherent transport in 2-terminal 1-D nanowires.

Abhishek Jasrotia(17MPY001) & Sunakshi Sharma(17MPY038) Dec 2018 - May 2019

Transposrt properties of 1-Dimensional zigzag graphene nanoribbons.

Robin Choudhary(CUHP18PGPAS19) Jan 2020 - July 2020

Certain aspects of Zigzag graphene nanoribbons in the confined region of the well.

Vijay Singh(CUHP18PGPAS26) Jan 2021 - July 2021

Quantum Hall Effect in zigzag Graphene Nanoribbons.

Kalpana(CUHP19PGPAS09) Jan 2021 - July 2021

Electron flow and coherent & Non coherent Transport in Mesoscopic devices.

Deepali Gill(CUHP19PGPAS05) Jan 2021 - July 2021

Strain effects in zigzag graphene nanoribbons.
Shiwangi Sharma(CUHP19PGPAS18) Jan 2021 - July 2021

Topological Defects in zigzag graphene nanoribbons.
Harinder Mohan(CUHP20PGPAS11) Jan 2022 - July 2022

Electronic & Optical Properties of MoS_2.
Nafisa Khatoon(CUHP20PGPAS14) Jan 2022 - July 2022

Study of Integer Quantum Hall Effect in Graphene.
Kritika Sharma(CUHP21PGPAS11) Jan 2023 - July 20223

Effect of ISOI in case of ZGNR.
Bhavya (CUHP22 PGPAS09 Jan 2024 - July 2024

Thermoelectric properties of ZGNR
Ritik Saklani(CUHP22PGPAS21 Jan 2024 - July 2024

Defects & Topological defects

SKILLS

Languages	English, Hindi & French (fluent)
Programming	MATLAB, LaTeX, C++, PYTHON,FORTRAN
OS	Windows, Linux, Mac OS X

ACADEMIC RESPONSIBILITIES

- DRC member in Department of Physics & astronomical science, CUHP
- Member in School Board, Department of Physics & astronomical science, CUHP
- Project Coordinator students of M.Sc (Physics) CUHP

REFERENCES

Prof. Niladri Sarkar
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Prof. Asok.K.Sen
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