

**Name:** Dr. Palvinder Kaur

**Designation:** Assistant Professor

**Specialization:** Condensed Matter Physics

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### **Education**

- **M.Sc. Physics** (2003, Guru Jambheshwar University, Hisar) (**GOLD MEDALIST**)
- **M.Phil** (2009, Maharishi Markendeshwar University, Mullana)
- **National Eligibility Test (NET)-2013**
- **Ph.D.** (28<sup>th</sup> March, 2018, Punjabi University, Patiala)  
**Title of Ph. D Thesis: "Structural, Morphological and Magnetic Characterisation of Semiconductor Nanomaterials".**
- *Advanced Diploma in Computer Software Technology (ADCST)* from ET & T Computer Education and Training Centre (2000-01), AmbalaCantt.

### **Professional Experience**

- Department of Physics, M.M. Modi College, Patiala, India (10 Aug, 2018 to till date)
- Department of Physics, Khalsa College, Patiala ( 2 Years 18 days)
- Department of Physics, Punjabi University, Patiala. 1 year teaching experience (during Ph.D: Characterisation techniques in experimental Physics)
- University College of Engineering, Punjabi University, Patiala (12-02-2010 to 31-05-2010 and 24-08-2010 to 30-06-2011)
- Swami Vivekanand College of Engineering & Technology, Banur (July, 09 - Feb., 10)

### **Teaching Interests:**

- Vibrations, Waves and Electromagnetic Theory
- Condensed Matter Physics
- Fiber Optics and Lasers
- Statistical and thermodynamics Physics

## Research Interest:

Condensed Matter Physics, Fiber Optics, Nanotechnology and IPR Matters

- **Three years 8 months Research Experience during Ph.D in the field of Nanotechnology** under the Topic **“Structural, Morphological and Magnetic Characterisation of Semiconductor Nanomaterials”**. It gave me good exposure to advanced techniques in physical sciences research.
- **Two years** (approx.) (March 04 - Jan 06) **Research Internship** under the scheme **CSIR Diamond Jubilee Research Interns awards scheme** at **Central Scientific Instruments Organization (CSIO) Chandigarh**, on **“Development of key technologies for Photonics and Optoelectronics”**
  - ✓ Theoretical understanding and experimenting Fiber Bragg gratings (FBGs) and long period gratings (LPGs), which have useful applications in optics communication systems like lasers, amplifiers, WDM add/drop filters and sensors like SHM, chemical, refractive index sensors etc. and their analysis using Optiwave Software and Optical Spectrum analyzer.
- **A dissertation work for the award of Degree of M.Sc. Applied Physics on “Fibre Optics Communication and its Future”**
  - ✓ Holography Kit, study of Interference, diffraction, Polarization using He-Ne Laser and Diode Laser, Optical Fibre Kit, Microprocessor Kit, Study of Non-Linear Effects etc.
  - ✓ Computational Physics Lab: Solving Laser and Fiber Related Problems on Computer using ‘C’ and FORTRAN

## Publications

1. **Palvinder Kaur**, Hung-Wei Kuo, Wei-Hsiang Huang, Chi-Liang Chen, Arun Kumar Singh & Sanjeev Kumar, *Insights on improved room temperature ferromagnetism in chemically co-precipitated Ru doped ZnS nanopowders*, **Applied Physics A**, **2020**, 126, 884.  
<https://doi.org/10.1007/s00339-020-04072-6>
2. **Palvinder Kaur**, Sanjeev Kumar, Chi Liang Chen, Kai-Saing Yang, Da-Hua Wei, Chung, Li Dong, C. Srivastava and S.M. Rao, *Gd doping induced weak ferromagnetic ordering in ZnS nanoparticles synthesized by low temperature co-precipitation technique*, **Materials Chemistry and Physics**, 2017, 186: 124-130.  
<https://doi.org/10.1016/j.matchemphys.2016.10.037>
3. **Palvinder Kaur**, Sanjeev Kumar, Chi Liang Chen, Ying-Ya Hsu, Ting-Shan Chan, Chung, Li Dong, C. Srivastava, Anupinder Singh and S.M. Rao, *Investigations on structural, magnetic and electronic structure of Gd doped ZnO nanostructures synthesized using sol-gel technique*, **Applied Physics A**, March 2016, Volume 122:161.

<https://doi.org/10.1007/s00339-016-9707-5>

4. **Palvinder Kaur**, Sanjeev Kumar, Anupinder Singh, C. L. Chen, C.L. Dong, T.S. Chan, K.P. Lee, C. Srivastava, S. M. Rao and M. K. Wu, *Improved magnetism in Cr doped ZnS nanoparticles with nitrogen co-doping synthesized using chemical co-precipitation technique*, **J Mater Sci: Mater Electron**, November 2015, Volume 26 (11): 9158-9163.

<https://doi.org/10.1007/s10854-015-3605-z>

5. **Palvinder Kaur**, S.K. Pandey, Sanjeev Kumar, N.S. Negi, C. L. Chen, S. M. Rao and M. K. Wu, *Tuning ferromagnetism in zinc oxide nanoparticles by chromium doping*, **Applied Nanoscience**, November 2015, Volume 5 (8): 975-981.

<https://doi.org/10.1007/s13204-014-0394-2>

6. S. K. Pandey, E. Ramya, J. K. S. Gangwar, **Palvinder Kaur**, Sanjeev Kumar, D. N. Rao, and S. M. Rao, *Structure and optical properties of MoS<sub>2</sub> films deposited by different methods on glass and silicon substrates* **AIP Conference Proceedings**, August 2015, 1675,020040.

<https://doi.org/10.1063/1.4929198>

7. **Palvinder Kaur**, S. Kumar, A. Singh, C.L. Chen, C.L. Dong, T.S. Chan, K.P. Lee, C. Srivastava, S.M. Rao and M.K. Wu, *Investigations on doping induced changes in structural, electronic structure and magnetic behavior of spintronic Cr-ZnS nanoparticles*, **Superlattices and Microstructures**, July 2015, Volume 83 : 785–795.

<https://doi.org/10.1016/j.spmi.2015.04.016>

8. **Palvinder Kaur**, Sanjeev Kumar, N.S. Negi and S.M. Rao, *Enhanced magnetism in Cr doped ZnO nanoparticles with nitrogen codoping synthesized using sol-gel technique*, **Applied Nanoscience**, March 2015, Volume 5 (3): 367-372.

<https://doi.org/10.1007/s13204-014-0326-1>

9. Sanjeev Kumar, **Palvinder Kaur**, C.L.Chen, R.Thangavel, C.L.Dong, Y.K.Ho, J.F.Lee, T.S.Chan, T.K.Chen, B.H.Mok, S.M.Rao and M.K.Wu, *Structural, optical and magnetic characterization of Ru doped ZnO nanorods*, **Journal of Alloys and Compounds**, March 2014, Volume 588:705-709.

<https://doi.org/10.1016/j.jallcom.2013.11.137>

10. Singh, N., Jain, S.C., Mishra, V., Poddar, G. C., **Kaur, Palvinder**, Singla, H., Aggarwal, A. K. and Kapur P. (2006). *Fiber Bragg Grating based sensing device for petrol leak detection*. **Current Science**, 90 (2): 219-221.

<https://www.jstor.org/stable/24088984>

11. Mishra, V., Singh, N., Jain, S. C., **Kaur, Palvinder**, Poddar, G.C. and Kapur P. (2007). *Fiber Gratings: Beyond Telecommunications*. **J. Pure & Apply. Physics**, 19 (1-4): 21-27.

12. Mishra, V., Singh, N., Jain, S.C., **Kaur, Palvinder**, Luthra, R., Singla, H., Jindal, V.K. and Bajpai, R.P. (2005). *Refractive index and concentration sensing of solutions using mechanically induced long period grating (LPG) pair*. **Optical Engineering (USA)**, 44 (9):094402.1-4.

<https://doi.org/10.1117/1.2054627>

## **Conferences /Seminars/Webinars**

### **(A) Resource person/Invited Lectures**

- 2 invited Lectures delivered on ‘**Patenting System In India**’ at Ramgharia Polytechnic, Phagwara and RIMT Polytechnic, Mandi Gobindgarh.

### **(B) Research Papers in Conferences**

1. Palvinder Kaur and Balwinder Singh Sooch, **Semiconductor Nanoparticles: A basis for next generation coating systems**, National Conference on Advanced and Emerging Material for Technological Applications (AEMTA-2024), Sant Longowal Institute of Engineering and Technology (SLIET), Deemed to be university , 15-16 March’ 2024
2. Palvinder Kaur, **Magnetism in semiconductor nanomaterials (A comparative study)**, 2nd International Conference on Recent Trends in Materials Science & Devices 2023, Research Plateau Publishers in association with Sat Kabir Institute of Technology & Management, Bahadurgarh, Haryana, India, 31 December’ 23
3. Palvinder Kaur, **Magnetism in Semiconductor Nanomaterials and Collaborative Research**, National Conference on Recent Advances In Chemical, Biological and Environmental Sciences (RACES- 2023), Multani Mal Modi College, Patiala, India, 12 April’ 23
4. Palvinder Kaur, **Enhanced magnetism in doped semiconductor nanomaterials**, Department of Applied Sciences, Punjab Engineering College (Deemed to be University), Chandigarh, International conference on Emerging Trends in Science and Technology, June ’22.
5. Palvinder Kaur, Pooja Rani, Manpreet Kaur, Kanandeep, Kavita. **Semiconductor Nanocrystals (NCs) and Quantum Confinement**, Recent Advances in Chemical & Environmental Sciences (RACES-2023), PG Department of Chemistry, Multani Mal Modi College, PTA, 11-12 April'19
6. Pooja rani, Kavita, Manpreet Kaur, Palvinder Kaur, Kanandeep, DFT study of electronic properties of toluene adsorbed on Na-Graphene interface, Recent Advances in Chemical & Environmental Sciences (RACES-2019), PG Department of Chemistry, Multani Mal Modi College, PTA 11-12 April' 19,
7. Manpreet Kaur, Kavita, Pooja Rani, Kanandeep, Palvinder Kaur, *Decay of a medium mass compound system formed in alpha-induced reaction*, Recent Advances in Chemical & Environmental Sciences (RACES-2019), PG Department of Chemistry, Multani Mal Modi College, PTA, 11-12 April' 19
8. Palvinder Kaur, **Doped Semiconductor Nanocrystals (NCs) for Enhanced properties of the nanomaterials**, 9<sup>th</sup> National conference on Recent Advances in

Chemical, Biological and Environmental Sciences (RACES-2018), Multani Mal Modi College, PTA, 09-10 Feb' 18

9. Palvinder Kaur, Sanjeev Kumar, and S.M.D., Rao. **Effect of nitrogen codoping on sol-gel synthesized Cr-doped ZnO nanoparticles on magnetism**, National Symposium on Progressive Trends in Chemical Sciences, Punjab University, Chandigarh on January 23, 2016
10. Palvinder Kaur, Sanjeev Kumar, Ankush Vij, Ravi Kumar and S.M.D.Rao, **Synthesis and Optical Characterization of Zinc Sulphide Nanoparticles**, International Conference on Interdisciplinary Areas with Chemical Sciences (ICIACS -2013), Punjab University, Chandigarh in association with Institute of Nano Science and Technology (INST), Mohali.on 30<sup>th</sup> Oct-1<sup>st</sup> Nov, 2013.
11. Palvinder Kaur, Sanjeev Kumar, S.K.Pandey, S.M.D.Rao, **Synthesis And Optical Characterization Of Zinc Oxide Nanoparticles**, National Symposium on Emerging Trends in Physics for Ionizing Radiations, Aerosols & Material Science (ETPRAM-13), December 13 - 14, 2013, PUP, Patiala.
12. Balwinder Singh Sooch, PalvinderKaur, Richa Sharma, Baljinder Singh Kauldhar, **Characterization and Antimicrobial Potential of Doped Zinc Oxide Nanoparticles**, International Conference on Interdisciplinary Areas with Chemical Sciences (ICIACS -2013), Punjab University, Chandigarh in association with Institute of Nano Science and Technology (INST), Mohali. 30<sup>th</sup> Oct-1<sup>st</sup> Nov, 2013
13. PalvinderKaur, S. K. Pandey, Leena Garg, Sanjeev Kumar, Puja Seth, ShrutiAgarwal, R.C. Verma, A.C. Sharma and S.M.Rao.,**Growth of multi-crystalline silicon sheets by the Capillary Action Shaping Technique**, XVII National seminar on crystal growth, Jan 9-11,2013, Anna niversity, Chennai.
14. PalvinderKaur, S. K. Pandey, Sanjeev Kumar, Anup Thakur, Pooja Seth, R. C. Verma and S. M. Rao., **Polycrystalline Si and Silicon nanowires for Solar Cell Applications** (2012) International Conference on Emerging Trends in Physics for Environmental Monitoring & Management (ETPEMM-12), December 17 - 19, 2012, PUP, Patiala.
15. Mishra, V., Jain, S. C., Singh, N., Poddar, G.C., Bansal, A. K., Palvinder Kaur, Jindal, V K.and Bajpai, R. P. (2005) **Bend Sensitivity study of mechanically created Long Period Gratings' (LPGs)**, *Proc.Asia Pacific Microwave Conference* (APMC-04).
16. Palvinder Kaur, Mishra, V., Luthra, R., Singla, H. and Poddar, G.C. (2004). *Optical Fiber Long Period Gratings for measurement of concentration & refractive index of liquids (in HINDI)*, *Proc. of Scientific & Technical National Seminar, TBRL/DRDO*, Chandigarh. P: 127-133.
17. Chander, G., Mishra, V., Palvinder Kaur,Luthra, R. and Singla, H. (2004) **Importance of Extrinsic Fabry-Perot Interferometric Sensor Technology for Defence Instrumentation**(in HINDI), Scientific & Technical National Seminar, *TBRL/DRDO*, Chandigarh.
18. Luthra, R., Palvinder Kaur, Mishra, V.,Singla, H. and Poddar, G.C. (2004) **Fiber Bragg Gratings: New Sensors** (in HINDI), Scientific & Technical National Seminar, *TBRL/DRDO*, Chandigarh.

19. Jerath N., Sooch B.S., Bakshi A.G. and Kaur Palvinder (2006) **IPR Management: A Strategic Need**. National conference on Managing strategies: A competitive advantage, GJIMT, Mohali.
20. Jerath N., Sooch B.S., Kaur Palvinder and Bakshi A.G. (2006). **Managing strategies of Intellectual Property**. National conference on Managing strategies: A competitive advantage, GJIMT, Mohali

## Webinars/Quizzes

1. Attended and participated in the 7-days virtual national level Capacity Building Programme on “Integration of Pedagogy & Technology in Teaching-Learning” from July 13-19, 2021 organised by MM Modi College, Patiala in collaboration with Council for Teacher Education Foundation (CTEF).
2. Participated in the Special Lecture on the occasion of World Environment Day, 2021 organised by Department of Local Governance, Rajiv Gandhi National Institute of Youth Development (RGNIYD), Sriperumbudur, Tamilnadu during 5<sup>th</sup> June, 2021 through online.
3. Participated in ‘Five- day online lecture series held on 22<sup>nd</sup> to 26<sup>th</sup> December, 2020 organised by P.G. Department of Physics, GSSDGS Khalsa College, Patiala.
4. Participated in the Webinar on “How to Write a Good Research Project Proposal” held on 31 May 2020 from 11:00 am to 1:30 pm organized by Department of Electronics and Communication Engineering, Punjabi University, Patiala in collaboration with Indian Institute of Technology, Kanpur.
5. Attended the National Webinar on “Frontiers of Science and Technology in Defence” held on 7 August 2020 organized by PG Department of Physics, GSSDGS Khalsa College, Patiala.
6. Participated in the One Day International Conference on “Novel Corona and Novel Challenges: Life Ahead with COVID – 19” held on 03 June 2020 organized by Sri Guru Gobind Singh College (UGC Cell), Sec 26, Punjab University, Chandigarh
7. Attended and Participated in the One Day National Webinar on the theme “Hind di Chadar: Sri Guru Tegh Bahadur” held on 26 August 2020 organized by Sri Guru Tegh Bahadur National Integration Chair, Punjabi University, Patiala.
8. Participated and qualified the International *E-Quiz* on “Environmental Science” from 25<sup>th</sup> July, 2020 to 30<sup>th</sup> July, 2020 organized by S.D. Kanya Mahavidyalaya, Mansa, Punjab, Punjabi University, Patiala, National Youth welfare and NSS.
9. Qualified National Level Online Quiz on “HIV/AIDS Awareness” held in July, 2020 organized by NSS unit and Red Ribbon Club S.S.D Women’s Institute of Technology, Bathinda.

## Workshops and training Courses

1. Successfully completed a 2-week online Inter-Disciplinary Course in “Managing Online Classes and Co-creating MOOCs” for “Faculty in Universities/Colleges/Institutes of Higher Education” from January 07 to January 21, 2024 and obtained **grade A<sup>+</sup>** organized by Teaching Learning Centre, Ramanujan College, University of Delhi under the aiges of MINISTRY OF HUMAN RESOURCE DEVELOPMENT, PANDIT MADAN MOHAN MALAVIA NATIONAL MISSION ON TEACHERS AND TRANING
2. Successfully completed the course on Classical Electromagnetism-2 (Magnetostatics) from August 15 to December 25, 2022 organized by centre for continuing education, Indian Institute of Technology, Kanpur.
3. Attended Two-Days (August 6-7<sup>th</sup> 2021) Workshop on “Possible Funding Opportunities in Materials Science” sponsored by SERB-DST Under SSR Scheme and organized by Department of Applied Sciences, Punjab Engineering College (Deemed to be University), Chandigarh.
4. Attended National Webinar on “Intellectual Property Rights (IPRs)” organized by Human Resource Development Centre, S. L. Bawa DAV College, Batala, Punjab (July 28, 2021).A
5. Attended National Webinar on “Intellectual Property Rights (IPRs)” organized by Human Resource Development Centre, S. L. Bawa DAV College, Batala, Punjab (July 28, 2021).
6. Successfully completed the course Classical Mechanics -1 from January 26 to April 25, 2021 organized by centre for continuing education, Indian Institute of Technology, Kanpur.
7. Successfully completed the course on Classical Electromagnetism from August 15 to December 13, 2020 organized by centre for continuing education, Indian Institute of Technology, Kanpur.
8. Successfully completed the course on Learning Physics through Simple Experiments from April 2 to June 10, 2020 organized by centre for continuing education, Indian Institute of Technology, Kanpur.
9. Successfully completed a 4-week Induction/**Orientation Programme** for “Faculty in Universities/Colleges/Institutes of Higher Education” from June 26 to July 24, 2020 and obtained **grade A<sup>+</sup>** organized by Teaching Learning Centre, Ramanujan College, University of Delhi under the aiges of MINISTRY OF HUMAN RESOURCE DEVELOPMENT, PANDIT MADAN MOHAN MALAVIA NATIONAL MISSION ON TEACHERS AND TRANING.
10. Successfully completed Faculty Development Programme on Emerging Issues and Challenges in Higher Education organized by Internal Quality Assurance Cell (IQAC) from July 17<sup>th</sup> to 22<sup>nd</sup> 2019 at Multani Mal Modi College, Patiala.
11. Attended Patent Awareness Workshop at Thapar Institute of Engineering and Technology, Patiala in association with Patent Information Centre, Punjab State Council for Science and Technology, Sec-26 on September 30, 2005.
12. One year Five months on job training in IPR Mattersat Patent Information Centre, Punjab State Council of Science & Technology, Chandigarh (January, 2006 – May ,07) under the Women Scientist Scholarship Scheme by TIFAC, Deptt. of Science and Technology (DST), Govt. of India.

- Knowledge of Intellectual Property Right Acts (Patent, Copyright, Design, Trademark, Geographical Indication, Plant Variety Protection and Farmer's Right Act, Semiconductor IC Layout Design), Knowledge of International Treaties and Protocols, Knowledge of IP Laws of India, Japan, US and European Countries.
- Conducting Patent searches on USPTO, Espacenet, Eureka and Indian databases and analyzing patents from various fields of S&T for novelty, inventiveness and industrial applicability, Patent Drafting and filing of patent applications.
- Assisted in organizing 9<sup>th</sup> all India PIC Meet, 3 patent awareness workshops and 4 patent awareness camps. Served as resource person in 2 of the camps and described "Patenting System in India".
- Submitted a project report on "Analysis of Patents in Fiber Optic technology".

### **Achievements, Awards and Recognitions**

- Organizing Physics Quiz and Poster making competition to celebrate National Science day at MM Modi College, Patiala since 2019.
- Awarded **Gold Medal** in M.Sc. Physics by Guru Jambheshwar Univ, Hisar (2003).
- Qualified **CSIR-UGC (NET)** in Physical sciences with rank 85/296.
- Qualified General Course on Intellectual Property through **World Intellectual Property Organisation (WIPO)**, Geneva (2006).
- Awarded **Women Scientist Scholarship** in IPR Matters by **TIFAC, Deptt. of Science and Technology (DST), Govt. of India, New Delhi** (2006-07).
- Awarded **CSIR Diamond Jubilee Research Internship** (2004-06).
- Shortlisted for Interview for the **Commonwealth Scholarship** for doctoral studies at UK (Dec. 2005).
- Awarded **Fellowship** by **National Science Centre, New Delhi** (2002).