



**School of Physical Sciences**

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**Dr. Shiv Poojan Patel**  
**Assistant Professor**

**Qualifications:** Ph.D., CSIR-JRF (NET), GATE.

**Area of Interest/Specialization:** Accelerator Physics, Nuclear Materials, Ion Induced Materials Modification, Ion Beam Analysis, Thermoelectric Materials, Perovskite Solar Cell, Experimental Condensed Matter Physics/Materials Science,

**Experience:**

- **Assistant Professor** (February, 2013- Till Now): Department of Pure & Applied Physics, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, India.
- **Research Associate** (December, 2012 – February, 2013): Pelletron Accelerator Group/Material Science, Inter-University Accelerator Centre (IUAC), New Delhi, India.
- **Post-Doctoral Fellow** (November, 2011–November, 2012): Experimental Condensed Matter Division, Institute of Physics, Bhubaneswar, India.

**Awards and Honors:** Nil

**Research Projects: 3**

1. **Project Title: Ion beam assisted metal induced crystallization of a-semiconductors.** IUAC, New Delhi Sponsored UFUP project (IUAC/XIII.7/UFR-62315). **Ongoing.**
2. **Project Title: Tailoring the Thermoelectric Properties of SnTe Nanocrystalline Thin Films using Ion Irradiation.** IUAC, New Delhi Sponsored UFUP project (IUAC/XIII.7/UFR-62315). Completed
3. **Project Title: Metal Induced Crystallization of Amorphous Semiconductors under Swift Heavy Ion Irradiation.** IUAC, New Delhi Sponsored UFUP project (IUAC/XIII.7/UFR-58308). Completed

**International Collaboration/Consultancy:** Nil

## Best Peer Reviewed Publication (up-to 10):

1. **Shiv P. Patel\***, T. Basu, M. Kumar, P. Mishra, T. Som, “*Microstructural, surface morphological, and magnetic properties of oblique angle deposited Co thin films on ion-beam fabricated self-organized Si substrates*”, **Materials Letters** **308** (2022) **131099**. (Impact Factor. **3.423**) ISSN: 0167-577X.
2. G. Maity, R. P. Yadav, Sunil Ojha, Rahul Singhal, D. Kanjilal, **Shiv P. Patel\***, *Mirco-morphological investigations on wettability of Al incorporated c-Si thin films using statistical surface roughness parameters*, **Surface and Interface Analysis** **54** (2022) **174-186**. (Impact Factor: **1.607**) ISSN:1096-9918
3. G. Maity, R. P. Yadav, R. Singhal, I. Sulania, A.K. Mittal, Dharendra K. Chaudhary, D. Kanjilal, and **Shiv. P. Patel,\*** “*Thickness effect on scaling law and surface properties of nano-dimensional SnTe thin films.*” **J. Appl. Phys.** **130** (2022) **175306**. (Impact Factor. **2.54**) ISSN: 0021-8979 (print); 1089-7550 (online).
4. G. Maity, R. P. Yadav, R. Singhal, P. K. Kulriya, A. Mishra, T. Som, S. Dhar, D. Kanjilal, and **Shiv. P. Patel,\*** “*Influence of fractal and multifractal morphology on the wettability and reflectivity of crystalline-Si thin film surfaces as photon absorber layers for solar cell*”, **J. Appl. Phys.** **129** (2021) **045301**. (Impact Factor. **2.54**) ISSN: 0021-8979 (print); 1089-7550 (online).
5. G. Maity, S. Dubey, Anter El-Azab, R. Singhal, S. Ojha, P. K. Kulriya, S. Dhar, T. Som, D. Kanjilale and **Shiv P. Patel \***, “*An assessment on crystallization phenomena of Si in Al/a-Si thin films via thermal annealing and ion irradiation*”, **RSC Advances**, **10** (2020) **4414-4426**. (Impact Factor. **3.361**) ISSN: 2046-2069.
6. G. Maity, S. Ojha, S. Dubey, P. K. Kulriya, I. Sulania, S. Dhar, T. Som, D. Kanjilal and **Shiv P. Patel \***, “*Crystallization of Ge in ion-irradiated amorphous-Ge/Au thin films*”, **CrystEngComm** **22** (2020) **666**. (Impact Factor. **3.545**) ISSN: 1466-8033.
7. G. Maity, R. Singhal, S. Dubey, S. Ojha, P.K. Kulriya, S. Dhar, T. Som, D. Kanjilal, **Shiv P. Patel\***, *Aluminum induced crystallization of amorphous Si: Thermal annealing and ion irradiation process*, **Journal of Non-Crystalline Solids**, **523** (2019) **119628**. (Impact Factor **3.531**) ISSN: 0022-3093.
8. Ashok Raj Patel, Geetika Patel, Gurupada Maity, **Shiv P. Patel,\*** Sumantra Bhattacharya, Anjaneyulu Putta, and Subhash Banerjee, “*Direct Oxidative Azo Coupling of Anilines Using a Self-Assembled Flower-like CuCo<sub>2</sub>O<sub>4</sub> Material as a Catalyst under Aerobic Conditions*”, **ACS Omega** **5** (2020) **30416–30424**. (Impact factor: **3.512**) ISSN: 2470-1343 (print); 2470-1343 (online).
9. G. Maity, Sunil Ojha, I. Sulania, K. Devrani, **Shiv P. Patel\***, *Fractal characterizations of energetic Si ions irradiated amorphized-Si surfaces*, **Surface and Interface Analysis** **51** (2019) **817-825**. (Impact Factor: **1.607**) ISSN:1096-9918
10. **Shiv P. Patel,\*** J.C. Pivin. G. Maity, R.P. Yadav, R. Chandra, D. Knajilal, and Lokendra Kumar, *Microstructural and surface morphological studies on Co doped ZnS diluted magnetic semiconductor thin film*, **Journal of Materials Science: Materials in Electronics** **29** (2018) **13541-13550**. (Impact factor: **2.478**) ISSN: 0957-4522 (Print) 1573-482X (Online)

**Recent Books/Book Chapters/Monographs etc.:** Nil

**Research Supervision:** 1 Ph.D. (awarded) 2 Ph.D. (ongoing), 22 M. Sc.

- **Mr. Gurupada Maity:** Thesis Title- “Ion Beam Assisted and Thermally Mediated Crystallization of Amorphous Semiconductors”. Awarded

**Administrative Responsibilities:**

- Academic Coordinator/Time Table Coordinator of Pure & Applied Physics, 2018-2020
- Election Officer, GGV Student Council, 2020
- Member, Radiation safety Committee, GGV, Bilaspur

**Additional Information:**

I played a key role in development and installation of 3 MV Pelletron accelerator facility at National Centre for Accelerator based Research, Department of Pure and Applied Physics, GGV, Bilaspur. I am actively involved in Accelerator experiments to support user research, maintenance and operation of 3 MV Pelletron Accelerator. National Centre for Accelerator based Research facility is a user centre which provides Rutherford Backscattering Spectrometry (RBS), Elastic recoil Detection Analysis (EDRA) and Particle Induced X-ray Emission (PIXE) techniques for the sample characterization, and ion implantation for materials synthesis and ion irradiation for material modification. As an one of the organizing secretary, I have successfully organized two workshops related the 3.0 MV accelerator facility and one acquaintance program at department of Pure and Applied Physics, GGV, Bilaspur.

**Addition information of Publications**

1. Geetika Patel, Ashok Raj Patel, Gurupada Maity, Sajal Das, **Shiv P. Patel\***, Subhash Banerjee “*Fabrication of self-assembled  $Co_3O_4$  nano-flake for one-pot synthesis of tetrahydrobenzo[b]pyran and 1,3-benzothazole derivatives*”, *Current Research in Green and Sustainable Chemistry* 5 (2022) 100258. ISSN: 2666-0865.
2. G. Maity, S. Ojha, G.R. Umapathy, **Shiv P. Patel**, Anter El Azab, Kailash Pandey, Santosh Dubey, “*Growth of low resistive nickel mono-silicide phase under low energy Si ion irradiation at room temperature*”, *Thin Solid Films* 733 (2021) 138826. (Impact Factor. 2.183) ISSN: 0040-6090.
3. Anand Pandey, Mulayam Patel, Dharendra Chaudhary, **Shiv P. Patel**, L. Sowjanya Pali; Ashish Garg, Lokendra Kumar, *Effects of 10 MeV  $Al^{4+}$  ions irradiation on fluorine-doped tin oxide substrates for photovoltaic device applications*, *Journal of Physics D: Applied Physics* 54 (2021) 275502. (Impact Factor. 3.207) ISSN: 0022-3727 (print); 1361-6463 (online).
4. Dharendra K. Chaudhary, Punit K. Dhawan, **Shiv P. Patel**, H.P. Bhasker, “*Large area semi-transparent inverted organic solar cells with enhanced operational stability using  $TiO_2$* ”

- electron transport layer for building integrated photovoltaic devices*”, **Materials Letters** **283** (2021) 128725. (Impact Factor. 3.423) ISSN: 0167-577X.
5. Saurabh Yadav, S. Dash, A. K. Patra, G. R. Umapathy, S. Ojha, **Shiv P. Patel**, R. Singh, and Y. S. Katharria, “*Effects of Energetic Ion Irradiation on  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Thin Films*”, **ECS Journal of Solid-State Science and Technology** **9** (2020) 045015. (Impact Factor. 2.070) ISSN: 2162-8769 (print), 2162-8777 (online).
  6. K. Ghosh, Rakesh K. Pandey, **Shiv P. Patel**, **T. Trivedi**, and P. K. Bajpai, “*Comparable nuclear and electronic energy loss effect of Au<sup>2+</sup> irradiation on structural, surface morphological, optical and phonon properties of Al:ZnO thin films*”, **Nuclear Inst. and Methods in Phys. Research B** **459** (2019) 22-28. (I.F. 1.377) ISSN- 0168-583X.
  7. Prashant Sharma, Padivattathumana Maya, Satyaprasad Akkireddy, Prakash M. Raole, Anil K. Tyagi Asha Attri , Pawan K. Kulriya, Parmendra K. Bajpai, Sudhir Mishra, **Shiv P. Patel**, Tarkeshwar Trivedi, K. B. Khan and Shishir P. Deshpande , *Effect of Heavy Mass Ion (Gold) and Light Mass Ion (Boron) Irradiation on Microstructure of Tungsten*, **Microscopy and Microanalysis** **25** (2019) 1442-1448. (Impact Factor 4.127) ISSN: 1431-9276 (Print), 1435-8115 (Online).
  8. P. N. Maya, Prashant Sharma, A. Satyaprasad, Saurabh Mukherjee, A. K. Tyagi, Sudhirsinh Vala, P. V. Subhash, A. Attri, Pawan Kumar Kulriya, Parmendra Kumar Kumar Bajpai, P. M. Raole, V. Karki, M. Singh, R. Kumar, Archana Lakhani, P. Kikani, Pratipalsinh A. Rayjada, M. Abhangi, Kedarmal, **Shiv P. Patel**, Tarkeshwar Trivedi, K Saravanan, S Kannan, C David, P K Pujari, Manoj Warriar, Sameer Khirwadkar and Shishir Deshpande, *Evaluation of tungsten as divertor plasma-facing material: Results from ion-irradiation experiments and computer simulations*, **Nuclear Fusion** **59** (2019) 076034. (Impact Factor: 3.179) Online ISSN: 1741-4326, Print ISSN: 0029-5515.
  9. A. R. Maridass, S. S. J. Xavier, L. Priya, S. Anbarasu, P. K. Bajpai, Shiva Poojan Patel & D. Prem Anand, *Crystal growth and characterization of Au<sup>3+</sup> ion irradiated 2-amino-5-nitropyridinium hydrogen oxalate (2A5NPHO)*, **Molecular Crystals and Liquid Crystals**, **664** (2018) 195-217. (I. F. 0.896) Print ISSN: 1542-1406/ Online ISSN: 1563-5287.
  10. A.P. Gnana Prakash, V. N. Hegde, T. M. Pradeep, N. Pushpa, P.K. Bajpai, **S. P. Patel**, T. Trivedi, J.D. Cressler, *5 MeV Proton Irradiation Effects on 200 GHz Silicon-Germanium Heterojunction Bipolar Transistors*, **Radiation Effects and Defects in Solids**, **172** (2017) 922-930. (I.F. 1.141) Print ISSN: 1042-0150/Online ISSN: 1029-4953.
  11. A.P. Gnana Prakash, T. M. Pradeep, V. N. Hegde, N. Pushpa, P.K. Bajpai, **S. P. Patel**, T. Trivedi, K.G. Bhusan, Comparison of effect of 5 MeV proton and Co-60 gamma irradiation on silicon NPN rf power transistors and N-channel depletion MOSFETs, **Radiation Effects and Defects in Solids**, **172** (2017) 952-963. (I.F. 1.141) Print ISSN: 1042-0150/Online ISSN: 1029-4953.
  12. T. Sehgal, A. Semwal, G. Maity, **Shiv P. Patel\***, *Hydrophilic Modifications of PVDF Membranes via swift heavy ion irradiations*, **Surface Engineering**, **34** (2018) 158-164. (I.F. 3.169) Print ISSN: 0267-0844 Online ISSN: 1743-2944.
  13. T. Trivedi, **Shiv P. Patel\***, P. Chandra, P.K. Bajpai, *Ion beams Facilities at the National Centre for Accelerator Based Research Using a 3.0 MV Pelletron Facility*, **Physics Procedia** **90** (2017) 100-106. ISSN: 1875-3892.

14. Manojit De, **Shiv P. Patel**, H. S. Tewari, *Strain Induced Structural Phase Transformation  $\text{NaNbO}_3$  doped  $\text{BiFeO}_3$* , **Journal of Materials Science: Materials in Electronics** 28 (2017) 6928–6935. (I.F. 2.478) ISSN: 0957-4522 (Print) 1573-482X (Online).
15. **Shiv P. Patel**,\* J. C. Pivin, R. Chandra, D. Kanjilal, and Lokendra Kumar, *Intrinsic Defects and Structural Phase of ZnS Nanocrystalline Thin Films: Effects of Substrate Temperature*, **Journal of Materials Science: Materials in Electronics** 27 (2016) 5640–5645. (I.F. 2.478) ISSN: 0957-4522 (Print) 1573-482X (Online).
16. C.R.K. Mohan, Ranajit Dey, **Shiv P. Patel**, Rakesh K Pandey, M. P Sharma and P. K. Bajpai, “Effects of swift heavy ion irradiation on dielectric relaxation and conduction mechanism in  $\text{Ba}_{0.90}\text{Sr}_{0.10}\text{TiO}_3$ ”, **Nuclear Inst. and Methods in Phys. Research B** 372 (2016) 50–57. (I.F. 1.377) ISSN- 0168-583X.
17. L. Kumar, R. Sethi, Dharendra K. Chaudhary, Mahesh Kumar and **Shiv P. Patel**\*, “Morphological Studies on Ag Doped CdZnS Alloy Nanostructures”, **Materials Focus** 5 (2016) 146-153. ISSN- 2169-429X.
18. **Shiv P. Patel**,\* J. C. Pivin, R. Chandra, D. Kanjilal, and Lokendra Kumar, “Ferromagnetism in Ni Doped ZnS Thin Films: Effects of Ni Concentration and Swift Heavy Ion Irradiation” **Vacuum** 111 (2015) 150-156. (I.F. 3.627) ISSN- 0042-207X.
19. **Shiv P. Patel**,\* J. C. Pivin, M. K. Patel, Jonghan Won, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar, “Defects Induced Magnetic Transition in Co Doped ZnS Thin Films: Effects of Swift Heavy Ion Irradiation” **Journal Magnetism and Magnetic Materials** 324 (2012) 2136-2141. (I.F. 2.993) ISSN- 0304-8853.
20. **Shiv P. Patel**,\* J. C. Pivin, A. K. Chawla, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar, “Room temperature ferromagnetism in  $\text{Zn}_{1-x}\text{Co}_x\text{S}$  thin films with wurtzite structure”, **Journal Magnetism and Magnetic Materials** 323 (2011) 2734–2740. (I.F. 2.993) ISSN- 0304-8853.
21. **Shiv P. Patel**,\* D. Kanjilal, and Lokendra Kumar, “Nanopatterning of ZnS Thin Films Surfaces by keV Ion Beam Irradiation”, **Surface & Coatings Technology** 206 (2011) 487-491. (I.F. 4.158) ISSN- 0257-8972.
22. **Shiv P. Patel**,\* S. A. Khan, A. K. Chawla, Ramesh Chandra, J. C. Pivin, D. Kanjilal, and Lokendra Kumar, “Structural Phase Diagram for ZnS Nanocrystalline Thin Films under Swift Heavy Ion Irradiation”, **Physica B: Condensed Matter** 406 (2011) 4150-4154. (I.F. 2.436) ISSN- 0921-4526.
23. **Shiv P. Patel**,\* A. K. Chawla, Ramesh Chandra, Jai Prakash, P. K. Kulriya, J. C. Pivin, D. Kanjilal, and Lokendra Kumar, “Structural phase transformation in ZnS nanocrystalline thin films by swift heavy ion irradiation”, **Solid State Communications** 150 (2010) 1158-1161. (I.F. 1.804) ISSN- 0038-1098.
24. **Shiv P. Patel**,\* J. C. Pivin, V. V. Siva Kumar, A. Tripathi, D. Kanjilal, and Lokendra Kumar, “Grain growth and structural transformation in ZnS nanocrystalline thin films”, **Vacuum** 85 (2010) 307-311. (I.F. 3.627) ISSN- 0042-207X.
25. **Shiv P. Patel**, \* L. Kumar, A. Tripathi, Y. S. Katharria, V.V. Siva Kumar, I. Sulania, P. K. Kulriya, D. Kanjilal. “Formation of ZnS nanostructures in  $\text{SiO}_2$  matrix by RF sputtering”,

AIP conference proceeding, 1147 (2009) 297-302. (DOI: [10.1063/1.3183447](https://doi.org/10.1063/1.3183447)). ISBN:- 978-0-7354-0684-1, ISSN:- 0094-243X.

### **Additional Publications in Conference Proceedings (=09)**

1. T. Trivedi, **S. P. Patel**, C. Mallik, Rakesh Kumar and P. K. Bajpai, “*Development of Research Facilities using High Current Low Energy 3.0 MV Pelletron Accelerator at NCAR, Bilaspur*”, **DAE-BRNS Symposium on Nuclear Physics 60 (2015) 930-931. ISBN-81-8372-077-3.**
2. P.K. Bajpai, **Shiv P. Patel**, T. Trivedi, C. Malli *et al.* “*Ion beams and material science facilities using high current low energy 3.0 MV particle Accelerator at NCAR, Bilaspur*”, **Proceedings of Indian Particle Accelerator Conference InPAC-2015, ID-137 (2015) 362-365.**
3. Jaidev Dewangan, T Trivedi, **S. P. Patel**, C Mallik *et al.* “*PLC based control system and maintenance activities of 3.0 MV Pelletron accelerator at NCAR, Bilaspur*”, **Proceedings of Indian Particle Accelerator Conference InPAC-2015, ID-308 (2015) 792-794.**
4. S.K Gupta, T. Trivedi, **Shiv Patel**, C Mallik *et al.* “*Safety aspects implemented in 3.0 MV Pelletron Accelerator at NCAR, GGV, Bilaspur*”, **Proceedings of Indian Particle Accelerator Conference InPAC-2015, ID-309 (2015) 795-798.**
5. P. K. Bajpai, T. Trivedi, **S. P. Patel**, C. Mallik and L. Chaturvedi, “*Status of 3.0 MV Pelletron Accelerator at National Centre for Accelerator based Research at GGV, Bilaspur*”, **DAE-BRNS Symposium on Nuclear Physics 59 (2014) 996-997.**
6. P. K. Bajpai, T. Trivedi, **Shiv. P. Patel**, C. Mallik and L.Chaturvedi “*National Centre for Accelerator based Research at GGV Bilaspur: Emerging facility for Neutron Generation*”. **Proceedings of the DAE Symposium on Nuclear Physics 58 (2013) 962-963. ISBN: 81-8372-070-6**
7. P. K. Bajpai, C. Mallik, Tarkeshwar Trivedi, **Shiv Poojan Patel**, Madhvendra Tripathi, Ajay Gupta, T. G. Reddy, S.K. Srivastava, Pradeep Das, R.P. Prajapati and Lakshman Chaturvedi “*Research activities and programs at the National Centre for Accelerator based Research: An upcoming 3 MV Palletron Facility*”. **Proceedings of Indian Particle Accelerator Conference InPAC-2013, ID-301 (2013) 702-704.**
8. L. Kumar, Monika mall, **Shiv P. Patel**, D. Kabiraj and D. K. Awasthi “*Optical characterization of ZnS nanocrystals embedded in SiO<sub>2</sub> matrix by atom beam co-sputtering*”. Proceedings of Emerging **Trends in Laser & Spectroscopy and Application (2009) 448-450. ISBN:- 8184246269.**
9. **S. P. Patel**, Numan Salah, A.Tripathi, S.P.Lochab, F.Singh, D.Kanjilal, Lokendra Kumar “*Synthesis and Characterization of Cu doped ZnS nanoparticles*”. Proceedings of the **DAE-Solid State Physics Symposium 52 (2007) 379-380. ISBN 81-8372-035-8.**

### **Invited/Resource person in Conferences/Seminars/Workshops**

1. **Shiv P. Patel**, “*Rutherford Backscattering Spectrometry (RBS): An Ion Beam Analysis (IBA) Techniques for Materials Characterizations, Workshop on “Probing Materials using Spectroscopic Tools: Basics & Applications” 28th February to 04th March 2022, Department of Physics, Mahatma Gandhi Central University, Motihari, Bihar,*

India. **Invited Talk.**

2. **Shiv P. Patel.** “*Low temperature development of crystalline-Si and-Ge via ion irradiation process for solar energy material applications*” 2<sup>nd</sup> National Conference on Advanced Materials and Applications (NCAMA). **December 28-29, 2020**, Department of Physics, National Institute of Technology (NIT), Raipur, India. **Invited Talk.**
3. **Shiv P. Patel.** “*Crystallization of Elemental Semiconductors via Swift Heavy Ion Irradiation for Solar Energy Material Applications*” International e-Conference on Advanced Functional Materials and Optoelectronics Materials. **June 13-15, 2020**, Prof. Rajendra Singh (Rajju Bhaiya) Institute of Physical Sciences for Study & Research, Veer Bahadur Singh Purvanchal University, Jaunpur, India. **Plenary Talk**
4. **Shiv P. Patel.** “*Charge Particle Accelerator and their Applications in Material Research*” Lecture Series on Recent Advances in Science & Technology. **20 April - 03 May 2020**, Prof. Rajendra Singh (Rajju Bhaiya) Institute of Physical Sciences for Study & Research, Veer Bahadur Singh Purvanchal University, Jaunpur, India. **Key Note Speaker**
5. **Shiv P. Patel.** “*Metal Induced Crystallization of amorphous semiconductor under swift heavy ion irradiation*” National Seminar on Advanced Materials for Sustainable Industrial and Social Applications. **17-18 January 2020**, Govt. Pt. Shyamacharan Shukla College, Dharsiwa, Raipur, Chhattisgarh, India. **Invited Talk**
6. **Shiv P. Patel.** “*Materials Engineering by Ion Beam*” National Conference on Recent Advances in Physical Sciences. **18-19 November 2019**, Govt. Kamladevi Rathi Girls P.G. College, Rajnandgaon, Chhattisgarh, India. **Invited Talk**
7. **Shiv P. Patel.** “*Materials Characterizations using Ion Beam Analysis Techniques*” Two Days National Workshop on Advances in Basic Science and Technology. **04-05 November 2019**, School of Science, OP Jindal University, Raigarh, Chhattisgarh, India. **Invited Talk**
8. **Shiv P. Patel.** “*Ion Beam Analysis Measurement Techniques for Materials Characterizations*” Two days Skill Development Workshop. **12-13 March 2019**, School of Physical Science, Guru Ghasidas Vishwavidyalaya, Bilaspur. **Invited Talk**
9. **Shiv P. Patel,** T. Basu, M. Kumar, P. Mishra, R. P. Yadav, and T. Som, “*Growth and Properties of Glancing Angle deposited Co thin films on Ion Eroded Rippled Surfaces*” at XX National Seminar on Ferroelectrics and Dielectric (XX NSFD 2018) **14-16 December 2018**, Department of Pure and Applied Physics, GGV, Bilaspur. **Invited Talk**
10. **Shiv P. Patel,** P.K. Bajpai, T. Trivedi, C. Mallik. “*Materials Modifications and Characterization using low energy ion Accelerator*”. 18<sup>th</sup> International Conference of International Academy of Physical sciences on Recent Trends in Physical Sciences. **December 22-24, 2015**. Faculty of Sciences, University of Allahabad, Allahabad. **Invited Talk**

### **Paper as an Oral/Poster Presentation**

1. **Shiv P. Patel.** Aluminum Induced Crystallization of *a*-Si via Thermal Annealing and Swift Heavy Ion Irradiation Processes. International conference (online) on Ion Beams in

- Materials Engineering and Characterization (IBMEC-2020). **08-11 December, 2020**. IUAC, New Delhi. **Oral talk**
2. **Shiv P. Patel**, Tanmoy Basu, Mohit Kumar, Pramita Mishra, and T. Som. “*Tailoring Magnetization of Co Thin films on Nano Rippled-Si Substrate*”. National Seminar on Applications of Nano and Smart Materials. **23-24 February, 2018**. Department of Physics, Sambhalpur University, Sambhalpur. **Oral talk**
  3. **Shiv P. Patel**, “*Nanostructuring of Materials using Energetic Ions: An Indian Aspect*”. International conference on Bharat Rejuvenation (ICBR-2017). **15-17 October, 2017**. Guru Ghasidas Vishwavidyalaya, Bilaspur-495009 (C.G.), India. **Oral talk**
  4. **Shiv P. Patel**, T. Basu, M. Kumar, P. Mishra, and T. Som. “*Glancing Angle Deposition of Co Thin films on Rippled-Si Substrate: An Advanced Functional Material*”. International Conference on Emerging Materials & Applications (ICEMA-2017). **20-22 February, 2017**. Physics Department, University of Allahabad, Allahabad. **Oral Talk**
  5. **Shiv P. Patel**, C. Pivin, Ramesh Chndra, Lokendra Kumar, and D. Kanjilal. “*Ferromagnetic Co Doped ZnS Thin Films with Wurtzite Structures*”. International Conference on New Scintillations on Materials Horizon (ICNSMH-2016). **21-23 October, 2016**. Department of Applied Physics, Mahatma Jyotiba Phule Rohilkhand University, Bareilly. **Oral Talk**
  6. **Shiv P. Patel**, T. Trivedi, R.K. Ambros, R.K. Pandey, Bindu Saho, Ranjit Dey, Pushpita Chandra and P.K. Bajpai. “*Materials Science Experiments using Low Energy Accelerator at NCAR, Bilaspur*”. International conference on Ion Beam in Materials Engineering and Characterizations (IBMEC 2016). **September 28 - October 01, 2016**. Inter-University Accelerator Centre (IUAC), New Delhi, INDIA. **Oral Talk**
  7. Rakesh Singh, **Shiv P. Patel**, T. Trivedi, C. Mallik, P.K. Bajpai, “*3.0 MV Pelletron Accelerator Ion Implanter as an Important Research Tool for Materials Modifications*”. One Day National Seminar on Advances in Synthesis and Characterization of Materials for Technological Applications, 30 March, 2015, Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009 (C.G.), India. **Poster Presentation**
  8. **Shiv P. Patel**. Two Days National Workshop on Particle Accelerator for Interdisciplinary Research: 18-19 February, 2014, Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009 (C.G.), India. **Oral Talk**
  9. **Shiv P. Patel**, and P. K. Bajpai, “*Luminescence and structural studies of energetic ion irradiated SrTiO<sub>3</sub> Single Crystal*”. Two Days National Workshop cum Theme Meeting on Ion Beam Induced Material Modifications & Neutron Generation using 3 MV Particle Accelerator: Applications in Physical, Chemical and Life Sciences: 19-20 August, 2013, Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009 (C.G.), India. **Oral Talk**
  10. **Shiv P. Patel**, J.C. Pivin, Ramesh Chandra, D. Kanjilal and, Lokendra Kumar. “*Swift Heavy Ion Induced Magnetic Transition in Co Doped ZnS Thin Films*”. Conference on Nanostructuring by Ion Beam (NIB-2011): **17-19 October, 2011**. University of Allahabad, Allahabad, India. **Oral Talk**



11. **Shiv P. Patel**, S.A. Khan, J.C. Pivin, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar. “*ERDA studies to understand the structural phase transformation of thin films of ZnS nanocrystals by swift heavy ion irradiation*”. Conference on *Swift Heavy Ions in Materials Engineering and Characterization (SHIMEC-2010)*: **6-9 October 2010**, IUAC, New Delhi, India. **Oral Talk**
12. **Shiv P. Patel**, L. Kumar, Jai Prakash, S. Srivastava, A. Tripathi, V.V. Siva Kumar, P. K. Kulariya, I. Sulania, Y.K. Vijay, and D. Kanjilal. “*Formation of ZnS nanoring structures in SiO<sub>2</sub> thin film by 100 MeV Ni<sup>+7</sup> ion beam irradiation*”. International Conference on Ion beam analyses (IBA-2009), Cambridge, U.K., (September-2009). **Poster Presentation**
13. **Shiv P. Patel**, Lokendra Kumar, A. Tripathi, V.V. Sivakumar, P. K. Kulriya, I. Sulania, and D. Kanjilal “*Nanoring formation by ion irradiation and thermal annealing: A comparative study*”. Joint ICTP/IAEA advanced workshop on development of radiation resistant materials at Trieste, Italy (April-2009). **Poster Presentation**.
14. **Shiv P. Patel**, Lokendra Kumar, A. Tripathi, Y. S. Katharri, V.V. Sivakumar, I. Sulania, P. K. Kulariya, and D. Kanjilal. International Conference on *Transport and Optical Properties of Nanomaterials (ICTOPON-2009)*: **5-9 January 2009**. University of Allahabad, Allahabad, India. **Oral Talk**
15. **Shiv P. Patel**, Numan Salah, A.Tripathi, S.P.Lochab, F.Singh, D.Kanjilal, Lokendra Kumar “*Synthesis and Characterization of Cu doped ZnS nanoparticles*”. DAE-SSPS 52 (2007) December 27-31. **Poster Presentation**
16. **S. P. Patel**, A. Tripathi, L. Kumar, D. Kanjilal, “*Synthesis of doped II-VI Binary Compound Semiconductor*”. Workshop on Material Science and Atomic/Molecular Physics Experiment using the Low Energy Ion Beam Facility: **22-22 February 2007**, IUAC, New Delhi, India. **Oral Talk**

### **Conferences/Workshops/Schools Attended**

1. *Indo-Japan School on Advanced Accelerator for ions and electron*. **February 16-18, 2015**. Inter-University Accelerator Centre (IUAC), New Delhi, INDIA.
2. *Awareness Workshop on the Facilities of UGC-DAE Consortium for Scientific Research*: 23-24 March 2012, Department of Physics, Utkal University, Bhubaneswar, India.
3. Joint ICTP/IAEA Advanced Workshop on *Development of Radiation Resistant Materials*: 20-24 April 2009, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.
4. Joint ICTP/IAEA Workshop on *Advanced Simulation and Modeling for Ion Beam Analysis*: 23-27 February 2009, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.
5. *School on Optical Characterization*: 30<sup>th</sup> June-2<sup>nd</sup> July 2008, IUAC, New Delhi, India.
6. Seminar cum Workshop on *Material characterization and modification of surface in research and industry by using ion accelerators (MCIA)*: 31<sup>st</sup> March-4<sup>th</sup> April 2008, Institute of Physics (IOP), Bhubaneswar, India.
7. Workshop on *Material Science with swift heavy ions*: 17<sup>th</sup> Sept-18<sup>th</sup> Sept 2007, IUAC, New Delhi, India.

## **Skill Development/Orientation/Refresher Courses Attended:**

1. Refresher course on “Nanoscience & Nanotechnology and Its Applications” UGC-HRDC, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) from 15-02-2021 to 27-02-2021.
2. Refresher course on “Instrumentation and Experimental Techniques in Physical Sciences” UGC-HRDC, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) from 09-12-2019 to 21-12-2019.
3. Interdisciplinary Refresher Course on “Refresher Course on Research Methodology for Interdisciplinary Research” UGC-HRDC, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) from 13-01-2016 to 02-07-2016.
4. 15<sup>th</sup> Orientation Programme, UGC-HRDC, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) from 15-06-2015 to 12-07-2015.

## **Conferences/Workshops Organized**

2. **Treasures**, XX National Seminar on Ferroelectrics and Dielectric (XX NSFD 2018) **14-16 December 2018**, Department of Pure and Applied Physics, GGV, Bilaspur.
3. **Organizing Secretary** “Two Days National Workshop on Particle Accelerator for Interdisciplinary Research”. **February 18-19, 2014**. Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495 009 (C.G.), INDIA.
4. **Organizing Secretary** “Two Days National Workshop cum Theme Meeting on Ion Beam Induced Material Modifications & Neutron Generation using 3 MV Particle Accelerator: Applications in Physical, Chemical and Life Sciences”. **August 19-20, 2013**. Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495 009 (C.G.), INDIA.
5. **Organizing Secretary** “One Day Acquaintance Program of IUAC, New Delhi”. **July 19 2013**. Department of Pure and Applied Physics, Guru Ghasidas Vishwavidyalaya, Bilaspur-495 009 (C.G.), INDIA.

## **Technical Knowledge & Experience**

- (b) **Ion Beam Based Experimental Nuclear Techniques:** Installation, Maintenance and user support of **RBS, PIXE, ERDA** facility with **3.0 MV Pelletron Accelerator** at GGV, Bilaspur. Having knowledge of **XRUMP**, and **SIMNRA** simulation codes for processing the RBS/ERDA data.
- (c) Training operation of the **15 UD Pelletron Tandems Accelerators** and **1.7 MV Pelletron Tandems Accelerator** at IUAC, New Delhi and having good knowledge about its working principle and physics.
- (d) **Thin Film Growth Techniques:** Pulse Laser Deposition (Excel Instruments) with Compex Pro 201 Laser (Coherent Lamda Physik GmbH)  
RF/DC Magnetron Sputtering (Excel Instruments)
- (e) **Well Known Characterization Techniques:** X-Ray Diffraction (XRD), Atomic Force Microscopy (AFM), UV-Vis Spectroscopy, Transmission Electron Microscopy (TEM),

Scanning Electron Microscopy (SEM), Photoluminescence (PL), Raman, and Fourier Transform Infrared (FTIR) Spectroscopy, Superconducting Quantum Interference Devices (SQUID) Magnetometry, and Electron Spin Resonance (ESR).

**Teaching Interest:**

- Accelerator Physics, Materials Modification, Synthesis and Characterization with Ion Beam
- Vacuum Pumps and Gauges
- Thin Films Fabrication Techniques
- Semiconductor Physics, Basic Electronics, Electronic Circuits
- Electricity and Magnetism, Thermal Physics and Thermodynamics

**Visits of Foreign Laboratories**

1. The Abdus Salam Center for Theoretical Physics (ICTP), Italy  
February, 2009  
April, 2009
2. ELETTRA Synchrotron Light Source, Trieste, Italy. April, 2009