

CURRICULUM VITAE

DR. SHIV POOJAN PATEL

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Department of Pure & Applied Physics
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Date of Birth: 10-05-1984 (10 May, 1984)
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Research Interest: Ion beam based experimental nuclear techniques for material characterization, Material modification under low energy and swift heavy ion irradiation, Diluted magnetic semiconductors, Nanopatterning of surfaces by energetic ions.

ACADEMIC QUALIFICATIONS:

Ph. D.:	Science/Physics/Materials Science	[2006 – 2012]
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Thesis Title: Studies on Nanostructured Thin Films and Their Swift Heavy Ion Induced Modifications

Institution: Inter University Accelerator Centre, New Delhi

University: University of Allahabad, Allahabad

Collaborations: CSNSM, IN2P3-CNRS, Batiment 108, F-91405 Orsay Campus, France
Indian Institute of Technology, Roorkee
Materials Science and Technology Division, MST-8 P.O.Box 1663, Mail Stop G755, Los Alamos National Laboratory, Los Alamos, NM 87545, USA

(Ph. D. thesis Submitted on 09th June 2011; Degree awarded on 16th April 2012)

Pre-Ph.D. Course Work:	Course Work	(2006 – 2007)
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Institution: Inter-University Accelerator Centre, New Delhi

M. Sc.:	Physics (Condensed Matter Physics)	(2004 – 2006)
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Institution: Physics Department

University: University of Allahabad, Allahabad, India

B. Sc.:	Physics, Geography, Mathematics	(2001 – 2004)
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Institution: University of Allahabad

University: University of Allahabad, Allahabad, India

PROFESSIONAL EXPERIENCE:

(A) Research Associate	[December, 2012 – February, 2013]
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Institution: Pelletron Accelerator Group/Material Science, **Inter-University Accelerator Centre (IUAC)**, New Delhi, **India**

Fellowship: Research Associate Fellowship of Institute

Research Area: Experimental Nuclear Techniques (RBS & ERDA) for materials characterization, Materials modification under ion irradiation

(B) Post-Doctoral Fellow	[November, 2011–November, 2012]
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Institution: Experimental Condensed Matter Division, **Institute of Physics**, Bhubaneswar, **India**

Fellowship: Post Doctoral Fellowship of Institute of Physics-Department of Atomic Energy, India

Research Area: Ion beam induced nanopatterning
Growth of thin films on patterned substrates for magnetic studies

(c) Doctoral Researcher	[February, 2007 – November, 2011]
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Institution: Materials Science Group, **Inter-University Accelerator Centre (IUAC)**, New Delhi, **India**

University: University of Allahabad, Allahabad, **India**

- Fellowship:**
1. **Junior Research Fellowship (JRF)** in Council of Scientific and Industrial Research (CSIR), New Delhi, India. (2 January, 2010 – 16 November, 2011)
 2. **Junior Research Fellow** in **UGC Funded University Projects (UFUP)** sanctioned by Inter University Accelerator Center, New Delhi, India. (5 November, 2007 – 1 January, 2010)
 3. **D. Phil. Scholarship** in University of Allahabad, Allahabad granted from University Grant Commission (UGC), New Delhi, India. (5 February, 2007 – 4 November, 2010)

Research Area: Synthesis and characterization of nanostructured thin films, Swift heavy

ions (SHI) induced materials modifications, Ion beam analysis (IBA), Defects and disorder in thin films by SHI irradiation

TECHNICAL EXPERIENCE

- (a) **Ion Beam Based Experimental Nuclear Techniques:** Maintenance and user support of **Rutherford Backscattering Spectrometry (RBS)** facility with **1.7 MV Pelletron Accelerator** at IUAC, New Delhi. Having good knowledge of **XRUMP**, and **SIMNRA** simulation codes for processing the RBS/ERDA data.
- (b) 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.
- (c) **Thin Film Growth Techniques:** Pulse Laser Deposition (Excel Instruments) with Complex Pro 201 Laser (Coherent Lambda Physik GmbH)
RF/DC Magnetron Sputtering (Excel Instruments)
- (d) **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).

PUBLICATIONS IN INTERNATIONAL JOURNALS

1. **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**.
2. **Shiv P. Patel**, J. C. Pivin, A. K. Chawla, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar, “*Room temperature ferromagnetism in $Zn_{1-x}Co_xS$ thin films with wurtzite structure*”, **Journal Magnetism and Magnetic Materials** **323** (2011) **2734–2740**.
3. **Shiv P. Patel**, D. Kanjilal, and Lokendra Kumar, “*Nanopatterning of ZnS Thin Films Surfaces by keV Ion Beam Irradiation*”, **Surface and Coating Technology** **206** (2011) **487-491**.
4. **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**.
5. **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**.
6. **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.

7. **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 SiO₂ matrix by RF sputtering*”, AIP conference proceeding, 1147 (2009) 297-302. (DOI: [10.1063/1.3183447](https://doi.org/10.1063/1.3183447)).

PUBLICATIONS IN CONFERENCE PROCEEDING/WORKSHOPS/ANNUAL REPORTS

1. **Shiv P. Patel**, J. C. Pivin, A. K. Chawla, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar “*Magnetic Transition in Co doped ZnS thin films by 120 MeV Ag ion irradiation*”. IUC Annual Report (2010-2011) 190-191.
2. **Shiv P. Patel**, J. C. Pivin, A. K. Chawla, Ramesh Chandra, D. Kanjilal, and Lokendra Kumar “*Swift heavy ions induced structural phase transition in ZnS nanocrystalline thin films*”. IUC Annual Report (2010-2011) 179-180.
3. L. Kumar, Monika mall, **Shiv P. Patel**, D. Kabiraj and D. K. Awasthi “*Optical characterization of ZnS nanocrystals embedded in SiO₂ matrix by atom beam co-sputtering*”. Conference on Meghnad Saha Memorial symposium on **Emerging Trends in Laser & Spectroscopy and Application** (2009) 448-450.
4. **Shiv P. Patel**, Lokendra Kumar, A. Tripathi, V.V. Sivakumar, I. Sulania, D. Kanjilal “*Nanoring formation and elongation of ZnS in SiO₂ by 100 MeV Ni ion beam irradiation*”. IUC Annual Report (2008-2009) 212-213.
5. **S. P. Patel**, Numan Salah, A.Tripathi, S.P.Lochar, F.Singh, D.Kanjilal, Lokendra Kumar “*Synthesis and Characterization of Cu doped ZnS nanoparticles*”. **DAE-Solid State Physics** 52 (2007) 379-380.

PAPERS AS A POSTER

1. **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 SiO₂ thin film by 100 MeV Ni⁷⁺ ion beam irradiation*”. International Conference on Ion beam analyses (IBA-2009), Cambridge, U.K, (September-2009).
2. Jai Prakash, A. Tripathi, S. A. Khan, Sarvesh Kumar, **Shiv P. Patel**, Abhishek Gupta, Jalaj Tripathi, and D. K. Avasthi, “*Swift heavy ion induced mixing in metal/polymer (Ni/Teflon) system: Role of electronic excitation (Se)*”. International Conference on Ion beam analyses (IBA-2009), Cambridge, U.K, (September-2009).
3. **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).

4. **Shiv P. Patel**, L. Kumar, A. Tripathi, V.V. Siva Kumar, I. Sulania, D. Kanjilal “ *Ion induced surface modification on ZnS:SiO₂ nanostructured thin films*”. Workshop on Surface and Interface Modification by Energetic Ions at Allahabad, India (March-2009).
5. **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 at Mysore (December-2007).

CONFERENCES/WORKSHOPS/SCHOOLS ATTENDED

1. *Awareness Workshop on the Facilities of UGC-DAE Consortium for Scientific Research: 23-24 March 2012, Department of Physics, Utkal University, Bhubaneswar, India.*
2. *Lectures on Photoemission* (Lectures have been given by Prof. P.A. Dowben, University of Nebraska-Lincoln, USA) and *One Day Workshop on Photoemission Studies of Advanced Materials: 08-13 December 2011, Institute of Physics, Bhubaneswar, India.*
3. *Workshop on Electron Microscopy: 22-25 November 2011, Institute of Physics, Bhubaneswar, India.*
4. *Conference on Nanostructuring by Ion Beam (NIB): 16-19 October 2011, University of Allahabad, Allahabad, India. Oral Talk*
5. *Conference on Swift Heavy Ions in Materials Engineering and Characterization (SHIMEC): 6-9 October 2010, IUAC, New Delhi, India. Oral Talk*
6. *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.*
7. *Workshop on Surface and Interface Modification by Energetic Ions: 18th March 2009, University of Allahabad, Allahabad, India.*
8. *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.*
9. *International Conference on Transport and Optical Properties of Nanomaterials (ICTOPON): 5-9 January 2009, University of Allahabad, Allahabad, India. Oral Talk*
10. *School on Optical Characterization: 30th June-2nd July 2008, IUAC, New Delhi, India.*
11. *Seminar cum Workshop on Material characterization and modification of surface in research and industry by using ion accelerators (MCIA): 31st March-4th April 2008, Institute of Physics*

(IOP), Bhubaneswar, India.

12. *52nd Solid State Physics symposium (SSPS)*, Department of Atomic Energy (DAE): 27-31 December 2007, University of Mysore, Mysore, India.
13. Workshop on *Material Science with swift heavy ions*: 17th Sept-18th Sept 2007, IUAC, New Delhi, India.
14. *Accelerator User Workshop*: 06-07 July 2007, IUAC, New Delhi, India. **Oral Talk**
15. 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**

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

Awards & Honours:

- Qualified CSIR-JRF (NET)
 - Qualified GATE