

Name: Dr. Ragini Raj Singh

Designation: Associate Professor

Department: Physics and Materials Science

PERSONAL DETAILS:

February 14, 2022

Biographical	Born 16/09/1978, Indian, Married + 2 (children)
Permanent Address	23/6, Housing Board Colony, Shoghi, Shimla, H.P., India
Present Position	Associate Professor Department of Physics and Materials Science, JUIT, Wagnaghat, Solan 173234, H.P., India
Mobile	+91-9625643296
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PARTICIPATION IN INSTITUTIONAL ACTIVITIES:

S. No.	Centre/Activity	Role	Duration
1	CEHTI		Member
2	CESTRD		Member
3	Board of Studies, Department of Physics and Materials Science		Member
4	E-Governance Committee		Member
5	JYC Sanction and procurement Committee		Faculty Coordinator
6	JYC Creative arts		Faculty

	committee	Coordinator
7	EK Bharat Shresth Bharat Mission	Member
8	Inspire MANAK Jury , Himachal Pradesh	Jury Member
9	DAE Conference	Reviewer

MEMBERSHIP OF PROFESSIONAL BODIES:

S. No.	Professional bodies	Type of membership
1	Indian Science Congress	Life
2	Materials research Society of India	Life

Research Projects from Govt. Funding Agencies:

Project	P.I.	Funding Agency	Duration	Budget (Rs. Lakhs)
Development, characterization & processing of quantum dots for imaging in near infrared (NIR) range	Ragini Raj Singh	SERB	2014-2018	24.80

RESEARCH COLLABORATION:

- (1) Prof Yosi Shacham Diamand, Tel Aviv University, Israel.
- (2) Dr. Salvo Mirabella, MATIS IMM-CNR and Dipartimento di Fisica e Astronomia, Università di Catania, via S. Sofia 64, 95123 Catania, Italy.
- (3) Prof. R. K. Pandey, Professor of Physics, Vice- Chancellor, IMS Unison University, Dehradun.

Inter Department Collaboration with Dr. Udayabanu Malairaman for bio applications of nanostructures

RESEARCH GUIDANCE:

PhD: 07 (4 Awarded; 03 running)

S. No.	Enrol. No. & Name of the Student	Title of Thesis/Dissertation/Project	Names of Joint Supervisors	Status (Completed/Ongoing)
1	106901, Ankush Thakur	Synthesis and Characterization of SrFe ₁₂ O ₁₉ : Effects of Rare Earth Elements on Structural, Morphological and Magnetic Properties	P. B. Barman	Completed
2	116902, Hitanshu Kumar	Development of II-VI And IV-VI Group Quantum Dots and their Core/Shell Structures	P.B. Barman	Completed
3	136952 Rajinder Kumar	Development of Ni _{0.6-x} Zn _{1-y} Co _x Fe ₂ O ₄ nanoparticles and thin films for high frequency applications	P.B. Barman	Completed
4	146955 Asha Kumari	Development, Characterization & Processing of Quantum Dots for Imaging in Near Infrared (NIR) Range	-	Completed
5	166903 Dipti Rawat,	Multifunctional Nanomaterials and their applications	P.B. Barman	Thesis Submitted
6	186904 Shiv Kumar	Application based doping of MgNi ferrites	P.B. Barman	Ongoing
7	206901 Rahul Singh	Synthesis of quantum dot materials for application in quantum dot sensitized solar cells (QDSSC)	-	Ongoing

REFEREED PUBLICATIONS (@Journals):

1. "Avant-grade magneto/fluorescent nanostructures for biomedical applications: Organized and comprehensive optical and magnetic evaluation" Dipti Rawat and **Ragini Raj Singh**, *Nanostructures and nanoobjects* (2021) 26:100714.
2. "Experimental and theoretical verification of cation distribution and spin canting effect via structural and magnetic studies of NiZnCo ferrite nanoparticles" R. Kumar, P. B. Barman, and **Ragini Raj Singh**, *Journal of Australian Ceramic Society* (2021) :1-11.
3. "Estimation and association of structural, elastic and magnetic properties of magnesium-nickel-ferrite nanoparticles annealed at different temperatures" S. Kumar, P. B. Barman, and **Ragini Raj Singh**, *Materials Science and Engineering B* (2021) 272:115362.
4. "An Innovative Direct Non-Aqueous Method for the Development of Co doped Ni-Zn Ferrite Nanoparticles." Rajinder Kumar, P. B. Barman, and **Ragini Raj Singh**, *Materials Today Communications* (2021) 27:102238.

5. "Biocompatible and fluorescent water based NIR emitting CdTe quantum dot probes for biomedical applications." Asha Kumari, Arun Sharma, Rahul Sharma, Udayabanu Malairaman, and **Ragini Raj Singh**, *Spectrochimica acta. Part A, Molecular and biomolecular spectroscopy* (2021) 248: 119206.
6. "Pioneering and proficient magneto fluorescent nanostructures: Hard ferrite based hybrid structures." Dipti Rawat, Jandeep Sethi, Simran Sahani, P. B. Barman, and **Ragini Raj Singh**, *Materials Science and Engineering: B* (2021) 265: 115017.
7. "Reitveld Refinement and Derivative Spectroscopy of Nanoparticles of Soft Ferrites (MgNiFe)." Shiv Kumar, **Ragini Raj Singh**, and P. B. Barman, *Journal of Inorganic and Organometallic Polymers and Materials* (2021) 31(2):528-541.
8. "Structural, luminescent and antimicrobial properties of ZnS and CdSe/ZnS quantum dot structures originated by precursors." Asha Kumari, Nutan Thakur, Jitendraa Vashisht, and **Ragini Raj Singh**, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* (2020) 229:117962.
9. "Corroboration and efficacy of Magneto-Fluorescent (NiZnFe/CdS) Nanostructures Prepared using Differently Processed Core." Dipti Rawat, P. B. Barman, and **Ragini Raj Singh**, *Scientific reports* (2019) 9(1):1-12.
10. "Multifunctional magneto-fluorescent NiZnFe@ CdS core-shell nanostructures for multimodal applications" Dipti Rawat, P. B. Barman, & **Ragini Raj Singh**, *Materials Chemistry and Physics* (2019) 23: 388-396.
11. "Approach to advance optical properties in CdS/ZnS and ZnS/CdS core/shell nanostructures through shell alteration" Hitanshu Kumar, **Ragini Raj Singh**, *Physica E: Low-dimensional Systems and Nanostructures* (2019) 108: 281-287.
12. "Structural and Luminescent Properties of Multifunctional Nanostructures", Dipti Rawat, Asha Kumari, **Ragini Raj Singh**, *AIP Conference Proceedings* (2018), 2009 (1), 020004-1-020004-4
13. "Effect of Coating on Antimicrobial and Optical Properties of Quantum Dots" Asha Kumari, **Ragini Raj Singh**, *AIP Conference Proceedings*, (2018) 2009 (1), 020025-1-020025-4.
14. 'Proficient Surface Modification of CdSe Quantum Dots for Highly Luminescent and Biocompatible Probes for Bioimaging: a comparative experimental investigation' Asha Kumari, Arun Sharma, Udayabanu M, and **Ragini Raj Singh**, *Journal of Luminescence* (2018), 199: 174-182.
15. "Cytotoxicity testing of bare CdSe quantum dots and their encapsulated structure", Asha Kumari and Ragini Raj Singh, *AIP conference Proceedings* (2017) 1860: 020003.

16. "Encapsulation of Highly Confined CdSe quantum dots for Defect Free Luminescence and Improved Stability" Asha Kumari and **Ragini Raj Singh**, *Physica E: Low dimensional systems and nanostructures* (2017) 89: 77-85.
17. "Tunable narrow emission in ZnS/CdS/ZnS quantum well structures prepared by aqueous route" Hitanshu Kumar, Asha Kumari and **Ragini Raj Singh**, *Optical Materials*, (2017) 69:23-29.
18. "Variation in magnetic and structural properties of Co doped Ni-Zn ferrite nanoparticles: A different aspect" Rajinder Kumar, Hitanshu Kumar, **Ragini Raj Singh*** and P. B. Barman, *J Sol-Gel Sci Technol* (2016) 78:566–575.
19. "Enhanced Saturation Magnetization in Cobalt Doped Ni-Zn Ferrite Nanoparticles" Rajinder Kumar, Hitanshu Kumar, Manoj Kumar, **Ragini Raj Singh** and P B Barman, *J Supercond Nov Magn* (2015) 28: 3557-3564.
20. "Effects of La³⁺-Nd³⁺ ions and pre-calcination on the growth of hexaferrite nanoparticles prepared by gel to crystallization technique: Non-isothermal crystallization kinetics analysis" Ankush Thakur, Partha B. Barman, **Ragini Raj Singh**, *Materials Chemistry and Physics* **156** (2015) 29-37.
21. "Effect of size and shell: Enhanced optical and surface properties of CdS, ZnS and CdS/ZnS quantum dots" Hitanshu Kumar, Partha B. Barman, **Ragini Raj Singh**, *Physica E: Low-dimensional Systems and Nanostructures*, **67** (2015) 168-177.
22. "Structural analysis of emerging ferrite: Doped nickel zinc ferrite" Rajinder Kumar, Hitanshu Kumar, **Ragini Raj Singh**, and P. B. Barman, *AIP Conference Proceedings* (2015) 1675, 030003.
23. "Low-Temperature Growth of Inverted Hexagonal ZnS/CdS Quantum Dots: Functional and Luminescence Properties", Hitanshu Kumar, Partha B. Barman, **Ragini Raj Singh**, *Journal of Electronic Materials*, **44/2** (2015) 675-681.
24. "Development of CdS, ZnS quantum dots and their core/shell structures by wet chemical method" Hitanshu kumar, P. B. Barman and **Ragini Raj Singh**, *International Journal of Scientific and Engineering Research*, **5/5** (2014) 40-53.
25. "Cobalt doped Nickel Zinc ferrite nanoparticles- XRD analysis an insight" Rajinder Kumar, **Ragini Raj Singh** and P. B. Barman, *International Journal of Scientific and Engineering Research*, **5/5** (2014) 12-20.
26. "Stable and luminescent wurtzite CdS, ZnS and CdS/ZnS core/shell quantum dots" Hitanshu Kumar, Manoj Kumar, P. B. Barman, Ragini Raj Singh, *Applied Physics A*, **117** (2014) 1249-1258.

27. "Synthesis and Characterizations of Nd³⁺ doped SrFe₁₂O₁₉ Nanoparticles" Ankush Thakur, **R.R.Singh*** and P.B.Barman, *Materials Chemistry and Physics*, **141/1** (2013) 562-569.
28. "Structural and magnetic properties of La³⁺ substituted strontium hexaferrite nanoparticles prepared by citrate precursor method" A. Thakur, **R.R. Singh***, P.B. Barman, *Journal of Magnetism and Magnetic Materials* **326** (2013) 35-40.
29. "Fe₃O₄ and CdS based bifunctional core-shell nanostructure" Joshy Joseph, K.K. Nishad, M. Sharma, D.K. Gupta, **R.R. Singh**, R.K. Pandey, *Materials Research Bulletin*, **47/6** (2012) 1471-1477.
30. "Crystallization Kinetics of Strontium Hexaferrite: Correlation to Structural, Morphological, Dielectric and Magnetic Properties." A. Thakur, **R.R. Singh***, P.B. Barman, *Electronic Materials Letters*, **8/6** (2012) 595-603.
31. Book review "Mercury Cadmium Telluride: Growth Properties and applications" Ragini Raj Singh* and P.B.Barman, *C*, **101/9** (2011) 1225-1226.
32. "Dielectric screening of early differentiation patterns in mesenchymal stem cells induced by steroid hormones" Amit Ron, Irena Shur, Ramiz Daniel, **Ragini Raj Singh**, Nick Fishelson, Nathan Croitoru, Dafna Benayahu, Yosi Shacham-Diamand, *Bioelectrochemistry*, **78/2** (2010) 161-172.
33. "Synthesis and Characterization of Electrochemically Deposited Nanocrystalline CdTe Thin Films" **Ragini Raj Singh**, Diksha Painuly and R. K. Pandey, *Materials Chemistry and Physics* **116/1** (2009) 261-268.
34. "Dielectric dispersion of suspended cells using 3D reconstructed morphology model" Amit Ron, **Ragini Raj Singh**, Nick Fishelson, Rina Socher, Natan Croitoru, Dafna Benayahu, Yosi Shacham-Diamand, *Bioelectro-chemistry* **75** (2009) 95-103.
35. "Biological cell-based screening for membranal and cytoplasmatic markers" **Ragini Raj Singh**, Amit Ron, Nick Fishelson, Irena Shur, Rina Socher, Dafna Benayahu, Yosi Shacham-Diamand, *Chemistry and Chemical Technology* **2/2** (2008) 105-115.
36. " Localization of membrane-bond OPN using force spectroscopy analysis", Amit Ron, **Ragini Raj Singh**, Nick Fishelson, Rina Socher, Dafna Benayahu, Yosi Shacham-Diamand, *Journal of Physics-Conference series* **100** (2008) 052040.
37. "Cell-based screening for membranal and cytoplasmatic markers", Amit Ron, **Ragini Raj Singh**, Nick Fishelson, Irena Shur, Rina Socher, Dafna Benayahu, Yosi Shacham-Diamand, *Biophysical Chemistry* **135** (2008) 59-68.
38. "Site localization of specific membrane proteins on the whole cell level by using Atomic Force Microscopy", Amit Ron, **Ragini Raj Singh**, Nick Fishelson, Rina Socher, Dafna Benayahu, Yosi Shacham-Diamand, *Biophysical Chemistry* **132** (2008) 127-138.

39. "Studies on Surface Processing and Passivation of p-HgCdTe using cadmium Sulfide films", **Ragini Raj Singh**, Diksha Kaushik, Madhulika Sharma and R.K.Pandey *Semiconductor Science and Technology*, **23** (2008) 015016.
40. "Self organized ZnSe quantum dots : synthesis and characterization", Diksha Kaushik, **Ragini Raj Singh**, A.B. Sharma, D. Gupta, M. Sharma, and R.K. Pandey, *Jr. Nanoscience and Nanotechnology*, **8/3** (2008) 1502-1511.
41. "A study of size dependent structural morphology and luminescence behaviour of CdS films on silicon substrate", Diksha Kaushik, **Ragini Raj Singh**, Madhulika Sharma, D.K. Gupta, N.P. Lalla, and R.K. Pandey, *Thin Solid Films*, **515** (2007) 7070-7079.
42. "Study of Electropolymerised Polyaniline Films Using Cyclic Voltammetry, Atomic Force Microscopy and Optical Spectroscopy" By Madhulika Sharma, Diksha Kaushik, **Ragini Raj Singh** and R.K.Pandey , *J. Mater Sci.: Mater Electron*, **17** (2006) 537-541.
43. "Study of Composition Modulation in Cu/ Co multilayers electrodeposited by pulse trains" by Dharendra Gupta, M. Sharma, A.C. Nayak, **Ragini Raj Singh**, S. K. Kulkarni and R. K. Pandey, *Thin Solid Films*, **513** (2006) 187-192.
44. "Synthesis & characterisation of electropolymerised polyaniline/Q-ZnSe composite films" By Diksha Kaushik, Madhulika Sharma, **Ragini Raj Singh**, D.K Gupta and R.K.Pandey, *Materials Letters*, **60** (2006) 2994-2997.
45. "Investigation of Passivation Processes for HgCdTe/CdS Structure For Infrared Application" by **Ragini Raj Singh**, Diksha Kaushik, D. K. Gupta, R.K.Sharma and R.K. Pandey, *Thin Solid Films*, **510** (2006) 535-540.
46. "In-situ Atomic Force Microscopic Study of Reverse Pulse Plated Cu/ Co-Ni-Cu Films" by Dharendra Gupta, A.C. Nayak, J. Mazher, **R. Sengar**, K.P.Joshi and R. K. Pandey, *Jr. Material Science*, **39** (2004) 1615-1620.
47. "Investigation of Size Dependent Optical and Morphological properties of Nano Crystalline ZnSe Films" by J. Mazher, S. Badwe, **Ragini Sengar**, Dharendra Gupta, R. K. Pandey, *Physica E*, **16** (2003) 209-213.

BOOK CHAPTERS:

48. "Synthesis and Functionalization of Magnetic and Semiconducting Nanoparticles for Catalysis", D Rawat, A Kumari, **RR Singh**, *Functionalized Nanomaterials for Catalytic Application*, (2021) 261-302.
49. "Controlled growth and characterization of CdS, ZnS, CdS/ZnS and ZnS/CdS core-shell quantum dots", in "Nanotechnology: Novel Perspectives and Prospects" Editor B.S. Bhoop, MC-GRAW HILL, (2015) 216-223.

REFEREED PUBLICATION (@ PROCEEDINGS):

50. . “Size controlled synthesis and characterization of CdS, ZnS quantum dots and their core/shell structures for bio-based applications” Hitanshu kumar, P. B. Barman and Ragini Raj Singh, *International Journal of Engineering Research and Technology*, MAM-2013, Conference proceedings.
51. “Nonaqueous and Aqueous Electrodeposition and Characterization of Polyaniline Films” Madhulika Sharma, Diksha Kaushik, **Ragini Sengar** and R. K. Pandey, *Electroactive Polymers: Material and Devices*, Volume I, Proceedings of “International Conference on Electroactive Polymers” Dalhousie-India-2004, Allied Publishers Pvt. Ltd. (2004) 44-52.
52. “Electrochemically Deposited Polyaniline/Semi-conductor Quantum Dot structures for Luminescent Devices” Diksha Kaushik, Madhulika Sharma, **Ragini Sengar**, Dharendra Gupta and R. K. Pandey, *Electroactive Polymers: Material and Devices*, Volume I, Proceedings of “International Conference on Electroactive Polymers” Dalhousie-India-2004, Allied Publishers Pvt. Ltd. (2004) pp. 10-17.

PARTICIPATION / PRESENTATIONS IN WORKSHOPS / CONFERENCES:

53. “Controlled growth and characterization of CdS, ZnS, CdS/ZnS and ZnS/CdS core-shell quantum dots” Hitanshu Kumar, P. B. Barman and **Ragini Raj Singh**, in *NanoSciTech2014* held in Punjab University, Chandigarh from 13 Feb to 15 Feb 2014.
54. “CdS/ZnS, ZnS/CdS and ZnS/CdS/ZnS quantum dots synthesized by wet chemical method: Investigations of optical and structural properties” Hitanshu Kumar, P. B. Barman and **Ragini Raj Singh**, *International conference on advanced functional materials (ICAFM) 2014* taking place under CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) Council of Scientific and Industrial Research at Thiruvananthapuram, Kerala from 19 Feb to 21 Feb 2014.
55. Influence of La³⁺-Nd³⁺ ions on the growth of hexaferrite nanoparticles, P. Barman, A. Thakur, R.R. Singh. T10 Nanoscience and Technology, #NST-9-Or-4, 19th International Vacuum Congress (IVC-19/CCN+T 2013 and partner conference), September 9-13, 2013, Paris, France, Page 796-797
56. “Preparation of citric-assisted PbFe₁₂O₁₉ hexaferrite nanoparticles” Ankush Thakur, **Ragini Raj Singh**, P.B. Barman, AMRP-2013, SLIET, Longowal, Punjab from Nov. 22-23, 2013.

57. "Influence of Ce³⁺-La³⁺ content on the formation of strontium hexaferrite nanoparticles" Ankush Thakur, **Ragini Raj Singh**, P.B. Barman, National Conference on Multifunctional Advanced Materials, at Shoolini University, Solan, India, May 2-4, 2013.
58. "Size-Controlled Synthesis and Characterization of CdS, ZnS Quantum Dots and their Core/Shell Structures for Bio Based Applications" Hitanshu Kumar, P. B. Barman and **Ragini Raj Singh**. National Conference on Multifunctional Advanced Materials, at Shoolini University, Solan, India, May 2-4, 2013.
59. "A Study on the Formation of Nanocrystalline Strontium Hexaferrite Produced via a Citric acid and Glycine as a Chelating Agent" Ankush Thakur, **Ragini Raj Singh**, P.B. Barman, International Conference on Macro and Supramolecular Architectures and Materials held at Coimbatore (Tamil Naidu), India, Nov. 21-25, 2012.
60. MRSI workshop on Antenna Materials during December 14-15, 2012 held at Jaypee University of Information Technology, Wagnaghat, Solan, H.P.
61. "Growth and Characterization of Inverted Core/shell Nano structures using CdSe and ZnSe" Nayan Mishra, Joshy Joseph, Varsha R. Mehto, D. Rathore, **Ragini Raj Singh**, R. K. Pandey. National Conference on Recent Trends in Materials Science (08-10 October 2011) held at Jaypee University of Information Technology, Wagnaghat, Solan, H.P.
62. IUCEE workshop on "Electronic and Opto-electronic Materials" held at JUIT, Wagnaghat, Solan, H.P., **India**, 30-5-2011 to 3-6-2011.
63. Attended "**Nano2Life**" meeting of **European Sixth Framework**, during June, 2008, held at Crete, **Greece**.
64. International conference of "**POLYCHAR16**" held at Lucknow (U.P.), **India** during 17-21 Feb. 2008.
65. 4th workshop of "**The center for nanoscience and nanotechnology**, Tel-Aviv University", at Ha'goshrim, **Israel**, Sept. 23-25, 2007.
66. Summer school on "**Highlights in Microtechnology**", Institute of Microtechnology (IMT), Neuchatel, **Switzerland** and Besanson, **France** during July 2-13, 2007.
67. Conference of "**Israeli Vacuum Society (IVS)**" at Tel-Aviv, **Israel**, Oct. 27, 2006.
68. Participated as a "**young scientist**" in 93rd Indian Science Congress held at Hyderabad, **India**, Jan. 3-7, 2006.
69. International Conference of **Electro-active polymers** held at Dallhausi (H.P.), **India**, Oct. 1-5 2004.

70. Participated in a one week workshop organized by AICTE on “**Nanomaterials**” at IIITM, Gwalior, **India**, during March 2004.
71. Participated in National conference in **Synthesis and characterization of Materials** DRDO, Delhi, **India**, Dec. 27-30, 2001.
72. International Conference of **Nanomaterials Synthesis and characterization** held at Dept. of Physics Barkatullah University, Bhopal, **India** Nov. 21-23, 2000.

ACADEMIC ACHIEVEMENTS:

- H-Index: 15 (Google Scholar and Research Gate), 15 (Scopus)
- I-10 Index: 23 (Google Scholar)
- Google scholar citations 710.
- Fall in top 20% researchers in the world (Research gate)
- Organizing secretary for the National Conference on Recent Trends in Materials Science (08-10 October 2011) held at Jaypee University of Information Technology, Waknaghat, Solan, H.P.
- 2010-Bio-Graphical sketch appeared in Marquis Who’s Who in the world, USA.
- Filed patent “Electronic Sorting and monitoring of cells for Point of Care applications by RAMOT (2008), Tel Aviv University, Israel
- Assisted in editing, formatting and communication to authors for the book entitled “**Advanced Nanoscale ULSI Interconnects: Fundamentals and Applications**” , **Y. Shacham-Diamand, T. Osaka, M. Datta, T. Ohba et al (EDS) from Springer (2009)**.
- One month vocational certificate training at Doordarshan Kendra, Bhopal during June, 1999.

LECTURES DELIVERED (INVITED):

St. Bede’s College, Shimla, Recent Trends in Nanotechnology, 28-02-2019.

Thapar University, Patiala, Punjab, Nanoscience and Nanotechnology: Implementation and Applications, 12-12-2011

RESEARCH EXPERIENCE:

During Teaching: 14+ years (Teaching and Research)

During Post Doc (Tel Aviv University, Israel): 3Years (Research and teaching Assistance ship)

Worked on, nano-bio interfacing and bio-chip technologies for the integration of living cells on chip. Dielectric Spectroscopy studies for screening of biological cells for Specific membranal and Cytoplasmatic markers. Also worked on microelectronics platforms using the clean room facilities, integration of whole cell on a “lab on chip” and use of SPM for nano scale detection of proteins on

cell membranes. Worked on, the design, fabrication and implementation of microfluidic DEP devices for biological cell sorting and manipulation. Dielectric Spectroscopy in Biological Cell-Based Screening for Specific Membranal and Cytoplasmatic Markers and Designing, fabrication and implementation of microfluidic DEP devices for biological cell sorting and manipulation. Nano-bio interfacing and bio-chip technologies for the integration of living cells on chip. The research includes developing microelectronics platforms using the clean room facilities at Tel-Aviv University. Bio chip design and simulation, lithograph and thin film technology and integration of whole cell on a “lab on chip” and using SPM for nano scale detection of proteins on cell membranes.

During PhD: (Research)

6 years in the field of Electro deposition and solution growth deposition of polycrystalline and nanocrystalline thin films and device fabrication.

- Developed very first time an electrochemical technique for passivation of mercury cadmium telluride for IR applications.
- Expertise in vacuum deposition, chemical bath deposition and electro deposition of thin films.
- Carried out a deposition of compound semiconductor such as CdS, CdTe, ZnTe, ZnSe, ZnS and metallic electro deposition of Cu and Ni on various substrates like glass, ITO and Alumina substrates.
- Carried out a Fabrication and characterization of MIS devices for different application such as Passivation of MCT for IR detectors and Photovoltaic cell.
- Expertise in handling Atomic Force Microscope and X-ray diffractometer since last six years.
- Expertise in working on photoluminescence Spectrophotometer, UV Spectrophotometer for different optical characterization especially of Nanocrystalline and Polycrystalline II - VI group semiconductor films.
- Five years experience in handling the instruments like precision LCR meter, Lock-in-amplifier, Potentiostat computer controlled data acquisition systems, Vacuum coating unit and knowledge in microprocessor interfacing.
- Carried out low temperature electrical and optical characterization for various device applications.
- Familiar with designing for cryostats for low temperature measurement, X – ray diffraction analysis, MFM, STM, LFM techniques, X – ray fluorescence technique, Cyclic

Voltametry and Photovoltametry. Experience of passivation of GaAs single crystal and MCT.

RESEARCH INTERESTS:

- Quantum dot based Solar cells.
- Multifunctional materials.
- Core/shell structures.
- Nanomaterials (semiconducting and magnetic) synthesis and characterization, for biological medical and electronic applications.
- Deposition and characterization of Nanomaterial thin films such of II-VI and IV-VI group semiconductor for devices. Perform experiments for enhancing luminescence efficiency of Nanomaterials (semiconductors) by different processing techniques.
- Dielectric spectroscopy of biological cells.
- Self assembled monolayers
- Microfluidic devices for biological cell sorting and manipulation.
- Nano-bio interfacing and bio-chip technologies, electrochemical biosensors and Electrochemical Processes.
- Individual molecule recognition using AFM techniques; Infra-Red Detectors.
- Thin Film Technology.
- Passivation studies of materials such as Mercury Cadmium Telluride, Gallium Arsenide crystals.
- Surface preparation of bulk materials for deposition of thin films with good outputs via mechanical, chemical and electrochemical routes.
- Synthesis and characterization of conducting polymers for application in luminescent devices.

REVIEWER IN INTERNATIONAL PEER REVIEWED JOURNALS:

- Journal of Materials Science (Springer)
- Materials Chemistry and Physics (Elsevier)
- Physica E (Elsevier)
- Bulletin of Material Science (Springer)
- Electrochemical and Solid state letters (Electro Chemical Society)

- Thin Solid Films (Elsevier)
- Spectrochimica Acta A (Elsevier)
- Sensors and Actuators :A (Elsevier)
- RSC Advances (Elsevier)
- Journal of sol Gel Science and Technology (Springer)
- Journal of Magnetism and Magnetic Materials (Elsevier)
- Journal of Alloys and compounds (Elsevier)
- Results in Physics (Elsevier)

COURSES TAUGHT:

- Biomaterial Science
- Advanced Solid State and Quantum Physics
- Statistical Thermodynamics
- Nano Analysis and Characterization Methods
- Optical Fiber Communication
- Interdisciplinary approach to Nanoscience
- Nano-biotechnology
- Physics Lab I and II
- Physics I
- Physics II
- Material Science
- Materials Characterization
- Basic Engineering Physics
- Basic Engineering Physics Lab
- Biophysical Techniques
- Bioinstrumentation Techniques
- Semiconducting luminescent materials
- Advances in Ferrites
- Engineering Physics I
- Engineering Physics II
- Engineering Physics Lab I and II
- Thin Films