

**Dr. RATAN DAS**  
**Assistant Professor (Stage III)**

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**Academic Qualification:** , Ph.D., M-Phil  
(NET, SLET, and GATE qualified)

**Subjects (Papers) teaching at the PG level:**

- (i) General Quantum mechanics
- (ii) Nuclear Physics and Particle Physics,
- (iii) Advance Quantum Mechanics.
- (iv) Astrophysics and Astronomy
- (v) Nanoscience and Nanotechnology

**Academic links:** [VIDWAN](#) | [Google Scholar](#) | [IRINS](#) |

**Research Interest:**

(Total Citation- **1279**, **h-index-19**, **i10 index - 24**)

Research interest lies in the field of Nanophysics and Nanotechnology.

(i) Synthesis of different types of nanoparticles including noble metal nanoparticles, quantum dots, and magnetic nanoparticles. Special interest in X-ray diffraction study for microstructural analysis, Raman spectral analysis.

(ii) Band gap engineering, phase transition and defects creation by SHI irradiation.

(iii) Working actively in the applications of nanomaterials as sensors and removal agents of toxic chemicals, antibacterial agents, nanoLED, nano biofertilizers, solar cells, soft magnetic materials etc.

**Projects completed and Ongoing: (Total grants- 90.72 lacs)**

Sl. No.	Title of the project	Funding agency	Total grand (Rs)	Status
1	Thermal analysis of a few synthesized magnetic and non-magnetic metal doped Spinel ferrite Nano crystals by TGA/DTA and their subsequent structural, optical and electrical study	SERB-DST, New Delhi	<b>54.61</b> <b>Lakhs</b>	Ongoing (2018- 2022)

2	Study of the energy transfer between fluorescent proteins and synthesized a few noble metal nanoparticles of different size and shape	SERB-DST, New Delhi	<b>28.73 Lakhs</b>	Ongoing (2018- 2022)
3	To study the correlation between optical and elastic properties of swift heavy ion irradiated samples of chemically synthesized a few Gr. II-VI semiconductor nanocrystals	IUAC, New Delhi	<b>6.03 Lakhs</b>	Ongoing (2018- 2022)
4	To study the correlation between optical and elastic properties of swift heavy ion irradiated samples of chemically synthesized a few Gr. II-VI semiconductor nanocrystals	UGC-DAE Consortium Mumbai	<b>1.35 Lakhs</b>	Ongoing (2018- 2022)

### Research Supervision: (PhD)

Sl. No.	Name of the Candidate	Title of the Thesis	Status
1	Dr. Sumit Sarkar	Synthesis of anisotropic silver nanocrystals for the study of their elastic and optical properties with suitable applications	Awarded in 2018
2	Dr. Pijush Ch. Dey	Synthesis of a few pure and doped group II-VI semiconductor nanocrystals by chemical route for the study of their optical and elastic properties and their applications	Awarded in 2021
3	Ms. Babli Debnath	Sensing, degradation, removal of toxic chemicals from water, using synthesized silver nanoparticles, along with a few biological applications.	Thesis Submitted
4	Ms. Simi Debnath	Synthesis of a few metal doped spinel ferrite nanocrystals for the study of their structural, optical and magnetic properties along with suitable applications	Registered
5	Mr. Debojyoti Nath	Swift heavy ions irradiation on CdSe & CdS nanocrystals for the study of phase transformation and	Thesis Submitted

		microstructural modifications, along with their optical properties.	
6	Ms. Sanghita Basak	Studies on structural, electrical & optical properties of some group ii-vi semiconductor nanocrystals along with analyzing the effect of swift heavy ion irradiation.	Registered

### Research Collaborator:

- Dr. Fouran Singh, Inter-University Accelerator Centre (IUAC), New Delhi, India.
- Dr. S M Yusuf, Solid state Division, BARC, Mumbai
- Dr. Debasish Sen, Solid state Division, BARC, Mumbai
- Dr. V. K Aswal, Solid state Division, BARC, Mumbai
- Prof. Siddhartha Sankar Nath, Assam University, India.

### List of Publication: (Total Citation- 1279, h-index-19, i10- 24)

[61] Debojyoti Nath, **Ratan Das**, Assessing the dislocation density in CdSe nanocrystals from XRD peak profile analysis (XDPPA) assisted by first principles method, **Physica E: Low-dimensional Systems and Nanostructures**, 144 (2022) 115376. (I.F.- 3.369)

[60] Debojyoti Nath, Fouran Singh, R. K. London Singh, **Ratan Das**, Tuning the optical constants and thermal properties of CdS nanocrystals by SHI irradiation: A blended analysis through DFT+ U and TS model, **Materials Science in Semiconductor Processing**, 138 (2022) 106278. (I.F.- 4.644)

[59] Debojyoti Nath, **Ratan Das**, Experimental (XRD) and theoretical (DFT) analysis for understanding the influence of SHI irradiation on the stacking fault energy in CdSe nanocrystals, **Journal of Alloys and Compounds**, 879 (2021) 160456. (I.F.- 6.371)

[58] Simi Debnath, Avisek Das, **Ratan Das**, Effect of cobalt doping on structural parameters, cation distribution and magnetic properties of nickel ferrite nanocrystals, **Ceramics International**, Volume 47 (2021) 16467-16482. (I.F.-5.532)

[57] Debojyoti Nath, **Ratan Das**, Surface and displacement damage engineering on CdSe nanocrystalline thin film by swift heavy Ag ions: A theoretical investigation by SRIM/TRIM package, **Vacuum**, 190 (2021) 110293. (I.F.- 4.110)

[56] P. C. Dey, **Ratan Das**, Impact of silver doping on the crystalline size and intrinsic strain of MPA-capped CdTe nanocrystals: A study by Williamson–Hall method and size–strain plot method, **Journal of Materials Engineering and Performance**, 30 (1) (2021) 652-660. (I.F.- 2.036)

[55] Babli Debnath, **Ratan Das**, Presence of fluoride in water diminishes fast the SPR peak of silver nanocrystals showing large red shift with quick sedimentation—A fast sensing and fast removal case, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 249 (2021) 119306. (I.F.- 4.831)

[54] Pijush C. Dey, Birson Ingti, Amitabha Bhattacharjee, Manabendra D. Choudhury, **Ratan Das**, Siddhartha S. Nath, Enhancement of antibacterial activity of synthesized ligand- free CdS nanocrystals due to silver doping, **Journal of Basic Microbiology**, 61(1) (2021) 27-36. (I.F.- 2.650 )

[53] Debojyoti Nath, Fouran Singh, **Ratan Das**, Atomistic strain and structural analysis of 120 MeV Ni ions irradiated CdSe nanocrystals through molecular dynamics simulation method, **Vacuum** 182 (2020) 109794. (I.F.- 4.110)

[52] Simi Debnath, **Ratan Das**, Cobalt doping on nickel ferrite nanocrystals enhances the micro-structural and magnetic properties: Shows a correlation between them, **Journal of Alloys and Compounds**, 852 (2020) 156884. (I.F.- 6.371)

[51] Sumit Sarkar, **Ratan Das**, Biraj Sarkar, Sukhendu Mandal, Different anisotropic silver nanocrystals show different antibacterial activities – an effect of different prominent crystallographic orientations in different shapes, **Current science** 118(12) (2020) 1903-1910. (I.F.- 1.102 )

[50] Pijush Ch. Dey, Sumit Sarkar, **Ratan Das**, X-ray diffraction study of the elastic properties of jagged spherical CdS nanocrystals, **Materials Science-Poland**, 38 (2020) 27. (I.F.- 0.77 )

[49] Pijush Ch. Dey, Priyatosh Nath, Debasish Maiti, **Ratan Das**, Antibacterial activity of MPA capped CdTe and Ag doped CdTe nanocrystals: Showing diferent activity against gram positive and gram negative bacteria, **Chemical Papers**, 74 (2020) 3409–342. (I.F.- 2.146 )

[48] Debojyoti Nath, Fouran Singh, **Ratan Das**, Band gap engineering of cadmium selenide nanocrystals using 120 MeV Ag<sup>7+</sup> swift heavy ions, alongside theoretical evidence through PBE+ U analysis, **Journal of Alloys and Compounds**, 836 (2020) 155535. (I.F.- 6.371)

[47] Debojyoti Nath, Fouran Singh, **Ratan Das**, 120 MeV Ni<sup>10+</sup> swift heavy ions irradiation on CdSe nanocrystals induces cubic to hexagonal phase transformation-A study of microstructural modification, **Materials Science in Semiconductor Processing**, 114 (2020) 105079. (I.F.- 4.644)

[46] Pijush Ch. Dey, **Ratan Das**, Enhanced photocatalytic degradation of methyl orange dye on interaction with synthesized ligand free CdS nanocrystals under visible light illumination, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 231(2020) 118122. (I.F.- 4.831)

- [45] Debojyoti Nath, Simi Debnath, Pijush Ch. Dey, Fouran Singh, **Ratan Das**, Microstructural analysis of SHI irradiated CdS nanocrystals- utilizing first principles method, **Journal of Alloys and Compounds**, 824 (2020) 153968. (I.F.- 6.371)
- [44] Debojyoti Nath, **Ratan Das**, Phase transformation of CdSe nanocrystals at high fluence irradiation of 120MeV swift Ni<sup>10+</sup> and Ag<sup>7+</sup> ions – X-ray diffraction and Raman spectral analysis, **Applied Surface Science**, 509 (2019) 144708.(I.F.- 7.392)
- [43] Simi Debnath, **Ratan Das**, Study of the optical properties of Zn doped Mn spinel ferrite nanocrystals shows multiple emission peaks in the visible range –A promising soft ferrite nanomaterial for deep blue LED, **Journal of molecular structure**, 1199 (2020) 127044. (I.F.- 3.841)
- [42] Babli Debnath, Sumit Sarkar, **Ratan Das**, Effects of Saponin Capped Triangular Silver Nanocrystals on the Germination of Pisum Sativum, Cicer Arietinum, Vigna Radiata Seeds & their Subsequent Growth Study, **IET Nanobiotechnology**, 14(2020) 25-32. (I.F.-1.847 )
- [41] Debojyoti Nath, Fouran Singh, **Ratan Das**, X-ray diffraction analysis by Williamson-Hall, Halder-Wagner and size-strain plot methods of CdSe nanoparticles- a comparative study, **Materials Chemistry and Physics**, 239 (2020) 122021.(I.F.- 4.77 )
- [40] Babli Debnath, **Ratan Das**, Controlled Synthesis of Saponin-Capped Silver Nanotriangles and Their Optical Properties, **Plasmonics**, 14 (2019) 1365–1375. (I.F.- 2.726 )
- [39] Simi Debnath, **Ratan Das**, Krishna Deb, Biswajit Saha, X-ray Diffraction analysis for the determination of elastic properties of Zinc doped Manganese Spinel Ferrite nanocrystals (Mn<sub>0.75</sub> Zn<sub>0.25</sub> Fe<sub>2</sub>O<sub>4</sub>), along with the determination of ionic radii, bond length and hopping length, **Journal of Physics and Chemistry of solids**, 134 (2019) 105-114. (I.F.- 4.383 )
- [38] Sumit Sarkar, **Ratan Das**, Synthesis of Silver Nano-cubes and Study of Their Elastic properties Using X-Ray Diffraction Line Broadening, **Journal of Nondestructive Evaluation** 38 (2019) 1-8. (I.F.- 2.588 )
- [37] Sumit sarkar, **Ratan Das**, Determination of structural elements of synthesized silver nano-hexagon from X-ray diffraction analysis, **Indian Journal of Pure and Applied Physics**, 56, (2018), 765-772. (I.F.- 0.846)
- [36] Sumit Sarkar, **Ratan Das**, Shape Effect on the Elastic Properties of Silver Nano-crystals, **Micro & Nano Letters**, 13(3), (2018) 312 – 315. (I.F.- 0.980 )
- [35] Pijush Ch. Dey, **Ratan Das**, Ligand free surface of CdS nanoparticles enhances the energy transfer efficiency on interacting with Eosin Y dye – Helping in the sensing of very low level

of chlorpyrifos in water, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 207 (2019) 156–163. (I.F.- 4.831)

[34] Sumit Sarkar, **Ratan Das**, Presence of Chlorpyrifos shows blue shift of the absorption peak of silver Nanohexagons solution-an indication of etching of Nanocrystals and sensing of Chlorpyrifos, **Sensors and Actuators: B Chemical**, 266 (2018) 149-159. (I.F.- 9.221)

[33] Sumit Sarkar, **Ratan Das**, Shape effect on the optical properties of Anisotropic silver Nano-crystals, **Journal of luminescence**, 98 (2018) 464-470. (I.F.- 4.171)

[32] Pijush Ch. Dey, **Ratan Das**, Effect of silver doping on the elastic properties of CdS nanoparticles, **Indian Journal of Physics**, 92(9) (2018) 1099–1108. (I.F.- 1.778)

[31] Subhagaurab Roy, Rupam Sen, Ashim Kalyan, **Ratan Das**, Raghunandan Das, New Way of Looking at Schrödinger Equation, **Journal of Advanced Physics**, 6 (2017) 426-429.

[30] Sumit Sarkar, **Ratan Das**, PVP capped silver nanocubes assisted removal of glyphosate from water- A Photoluminescence study, **Journal of Hazardous Materials**, 2017, 339, 54-62. (I.F.- 14.224)

[29] Pijush Ch. Dey, **Ratan Das**, Photoluminescence quenching in ligand free CdS nanocrystals due to silver doping along with two high energy surface states emission, **Journal of luminescence**, 183 (2017) 368-376. (I.F.- 4.171)

[28] Jaba Saha, Arpan Datta Roy, Dibyendu Dey, D. Bhattacharjee, Pabitra Kumar Paul, **Ratan Das**, Syed Arshad Hussain, Effect of zinc oxide nanoparticle on Fluorescence Resonance Energy transfer between Fluorescein and Rhodamine 6G, **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 2017, 175, 110-116. (I.F.- 4.831)

[27] Sumit Sarkar, **Ratan Das**, Photoluminescence Study of Silver Nano-hexagons, **Plasmonics**, 11 (2016) 551–556. (I.F.- 2.726 )

[26] **Ratan Das**, Sumit Sarkar, Optical properties of silver nano-cubes, **Optical Materials**, 48, (2015) 203–208. (I.F.-3.752 )

[25] **Ratan Das**, Sumit Sarkar, X-ray diffraction analysis of synthesized silver nano-hexagon for the study of their mechanical properties, **Materials Chemistry and Physics**, 167, (2015) 97-102. (I.F.- 4.77 )

[24] **Ratan Das**, Sumit Sarkar, Determination of intrinsic strain in poly(vinylpyrrolidone)-capped silver nano-hexapod using X-ray diffraction technique, **Current Science**, 109 (2015) 775-778. (I.F.- 1.102)

[23] **Ratan Das**, Sumit Sarkar, Williamson Hall plot analysis of the XRD result of synthesized silver nano-cubes for the determination of their elastic properties, **Advanced Science Letters**, 2016, 22, 145-148.

[22] **Ratan Das**, Rupam Sen, Ashim Kalyan, Raghunandan Das, Subha Gaurab Roy, Joydeep Choudhury, B. Indrajit Sharma, R. K. Thapa, Siddhartha Sankar Nath, Ramendu Bhattacharjee, Lie Algebraic Study of Infra-Red Active Spectra of Single-Layer Graphene, **Polycyclic Aromatic Compounds**, 2014, 34, 214-224. (I.F.- 3.744)

[21] **Ratan Das**, Sumit Sarkar, Mitu Saha, Pijush Ch. Dey, Siddhartha S. Nath, Two peak luminescence from linoleic acid protected gold nanoparticles, **Journal of Luminescence** 2015, 168, 325-329. (I.F.- 4.171)

[20] **Ratan Das**, Mitu Saha, Syed Arshad Hussain, Siddhartha S. Nath, Silver Nanoparticles and Their Antimicrobial Activity on a Few Bacteria, **BioNanoScience**, 2013, 3, 67–72. (I.F.- 2.305)

[19] **Ratan Das**, Siddhartha S. Nath, Ramendu Bhattacharjee, Synthesis and Characterization of Linoleic Acid Capped Palladium Nanoparticles (Chapter Title), **Advanced Nanomaterials and Nanotechnology** (Book Title), **Springer Proceedings in Physics**, 2013, 143, 139-142

[18] **Ratan Das**, S. Gang, S. S. Nath, and R. Bhattacharjee, Preparation of Linoleic Acid Capped Silver Nanoparticles and Their Antimicrobial Effect, **Journal of Nanobiotechnology**, 2012, 6(2), 81 – 85, ISSN 1751-8741.

[17] **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Luminescence of Copper Nanoparticles, **Journal of Luminescence**, 2011, 131, 2703-2706, ISSN 0022-2313. (I.F.- 4.171)

[16] **Ratan Das**, S. Gang, S. S. Nath, and R. Bhattacharjee, Preparation and Antibacterial Activity of Silver Nanoparticles, **Journal of Biomaterials and Nanobiotechnology**, 2011, 2, 472-475, ISSN 2158-7027. (I.F.- 2.06 )

[15] G. Gope, S. S. Nath, D. Chakdar, **Ratan Das**, Improving the tuning phenomenon of CdS quantum dot by Fe<sup>3+</sup> Doping, **J. Nanotech. Prog. Int. (JONPI)**, 2011, issue 4.

[14] **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Synthesis of Uniform Silver Nanoparticles and Their Characterization (Chapter Title). **Photonics and Quantum Structures (Book Title)**, **Narosa publishers**, 2011, 103-107, , ISBN 978-81-8487-098-5.

[13] **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Preparation of Linoleic Acid Capped Gold Nanoparticles and Their Spectra, **Physica E: Low-dimensional Systems and Nanostructures**, 2010, 43, 224-227, ISSN: 1386-9477. (I.F.- 3.369)



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- [10] **Ratan Das**, S. S. Nath, G. Gope, D. Chakder, and R. Bhattacharjee, Synthesis of Silver Quantum Dots and Their Characterizations, Assam University Journal of Science & Technology, 2010, 5(II), 123-125, ISSN 0975-2773.
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- [8] S. C. Dey, **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Fluorescence of CdSe Quantum dots suspended in liquid paraffin, **NANO**, 2010, 5(6), 357-359, ISSN: 1793-7094. (I.F.- 1.556)
- [7] **Ratan Das**, S. C. Dey, G. Gope, S. S. Nath, and R. Bhattacharjee, Characterization of Linoleic Acid Protected Gold Nanoparticles, Assam University Journal of Science & Technology, 2010, 6( II), 26-29, ISSN 0975-2773.
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- [5] **Ratan Das**, S. S. Nath, G. Gope, D. Chakder, and R. Bhattacharjee, Synthesis of Silver Nanoparticles and Their Optical Properties, **Journal of Experimental Nanoscience** , 2010, 5(4), 357-362, ISSN: 1745-8099. (I.F.- 3.075)
- [4] S. C. Dey, **Ratan Das**, G. Gope, S. S. Nath, and R. Bhattacharjee, UV/vis spectroscopy and impedance analysis of CdSe Quantum Dots, Assam University Journal of Science & Technology, 2010 6(II), 1-5, ISSN 0975-2773.
- [3] S. C. Dey, **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Photoluminescence of CdSe Quantum dots suspended in liquid paraffin, **OPTOELECTRONICS AND ADVANCED MATERIALS**, 2010, 4(11), 1721 – 1723.
- [2] **Ratan Das**, S. S. Nath, and R. Bhattacharjee, Characterization of Linoleic Acid Capped Copper Nanoparticles (Chapter Title), **Synthesis and Characterization of Nanostructured Materials (Book title)**, **MacMilan Publishers**, 2010, 299-304, ISBN 10:0230-33193-9.



[1] S. S. Nath, D. Chakdar, G. Gope, **Ratan Das** and D. K. Avasthi, Novel Effect of 100 MeV Ni<sup>+7</sup> ion on silica coated ZnS quantum dots, IUAC Annual Report, pp 148, 2008.

### **Seminars/ Conferences attended:**

#### **Invited talk - 13, Oral/poster presentation- 30**

**43.** Delivered an **invited talk** on “Nanoscience and Nanotechnology: A platform for executing expected applications specially in the field of **Sustainable energy**” in the celebration of National Science Day-2022 on the theme “Integrated Approach in S & T for Sustainable Future” held on 20th July 2022 at Bir Bikram Memorial College. Tripura, Agartala.

**42.** Delivered an **invited talk** on “Nanoscience and Nanotechnology: A platform for executing expected applications” in the programme of “National Science Day” organised by Department of Physics, Iswarchandra Vidyasagar College, Belonia, Tripura, held on 4th April, 2022.

41. Delivered an **invited talk** on “Nanoscience and Nanotechnology: a simple discussion about past, present and future” in the **One day seminar on Recent Advances in Physical sciences** organised by Department of Chemistry and Department of Physics, Netaji Subhash Mahavidyalaya, Udaipur, Gomati, Tripura. on December 30, 2021.

40. Delivered an **invited talk** on “Influence of SHI induced microstructural modifications on the optoelectronics properties of CdS and CdSe nanocrystals: A suitable material for Solar cell and power generation application” in the ATAL FDP on Progress in Novel Two dimensional Materials held from 04-08 October, 2021.

**39. Oral presentation** on “Modifications of the band gap of CdSe nanocrystals by SHI irradiation; A supported theoretical DFT based analysis.” in the International Virtual Conference on Materials Research (IVCMR-21) organised by the Department of Physics, Easwari Engineering College, Ramapuram, Chennai held during August 26-27, 2021.

38. Delivered an **invited talk** on “Structural modification of a few semiconductor nanocrystals through swift heavy ions (SHI) irradiation” in the ATAL FDP on Novel materials held online from 24-28 August, 2021.

**37. Oral presentation** entitled “Band Gap Modification of Cadmium Selenide Nanocrystals using Swift Heavy Ions: Supported Theoretical Analysis through DFT analysis” in the International Conference on Ion Beams in Materials Engineering and Characterization (IBMEC-2020) organised by IUAC, New Delhi 8-11 Dec, 2020.

36. Delivered an **invited talk** entitled “Sensing of different Toxic Chemicals in Water using nanomaterials” in the AICTE (ATAL) FDP online on Sensor Technology organised by Department of Physics, Tripura University AICTE from 21-25 sept., 2020.

35. Delivered an **invited talk** on “X-ray Diffraction analysis of nanomaterials and its application” in the National Webinar on Recent Advances in Physical Research organised by Govt. Degree College, Dharmanagar, Tripura 12th August, 2020.

34. Delivered an **invited talk** on “Characterization of Nanomaterials by X-ray diffraction analysis” in the Two days National Webinar on Recent Development in the Characterization of Nanomaterials organised by Department of Chemistry, G C College, Silchar, Assam 10th September, 2020.

33. Delivered an **invited talk** “Removal of pesticides from drinking water using noble metal nanoparticles” in the Indo-French Workshop on Water Treatment and Management organised by UPES, Dehradun 28th -29th March, 2018.

32. **Oral presentation** on “Shape effect on the Elastic and optical Properties of Silver Nanocrystals ” in the UGC and INSA sponsored National Seminar on Frontiers of Research in Physical Sciences organised by Department of Physics, Karimganj College, Assam 19-21 January, 2018.

31. Presented a paper entitled “On the Sensing of a few pesticides using PVP capped Silver Nanocrystals ” in the Bose Tagore National Advanced Workshop on Recent Advances in Condensed Matter Physics: Theory and Experiment organised Department of Physics, Visva-Bharati, Santiniketan, 3-4 August, 2018.

30. **Oral presentation** on “PVP capped silver nanocrystals as sensors of pesticides ” in the UGC sponsored National Seminar on Recent Trends in Basic Science Research (RTBSR-2017) organised by Dept. of Physics and Chemistry Srikrishna Sarada College, Hailakandi, Assam 21 Sep. to 23rd Sep., 2017.

29. Presented a paper entitled “Elastic and Optical properties of Silver Nanocrystals” in the International Conference on Ion Beams in Materials Engineering and Characterization (IBMEC-2016) organised by IUAC, New Delhi 28th Sep. to 1st October, 2016.

28. Delivered an **invited talk** “Nanotechnology” in the PHOENICS-2016, organised by the Department of Electrical Engineering, Tripura University and Institute of Radio Physics and Electronics, University of Calcutta during 29 March - to 4th March, 2016.

27. Presented a poster entitled “Shape effect of the photoluminescence spectra of chemically synthesised anisotropic silver Nanocrystals” in the ICAAN-2015, organised by Center for nanotechnology, IIT Guwahati during 08-11 Dec., 2015.

26. Delivered an **invited talk** “Nanoparticles and Applications” in the DBT sponsored star college workshop on Physics organised by the Department of Physics, S. S. College, Hailakandi, Assam on 14th March, 2015.

25. Presented a poster entitled “Elastic Properties of Anisotropic silver nanocrystals” in the Winterschool-2014 on Frontier of Material Science, organised by International Center for material science, JNC SAR, Bengaluru in association with Cambridge university during 01-5th Dec, 2014.

24. Presented a poster entitled “X-ray diffraction analysis of anisotropic silver nanocrystals” in the Third International symposium on clusters, cluster assemblies and nanoscale materials (ISCANM-III) held at Harish Chandra Research Institute, Allahabad during March 11-14, 2014.

23. **Oral presentation** on “Mechanical properties of anisotropic silver nanocrystals” in the National Seminar on Frontiers of Research in Physical Sciences organised by Department of Physics, Karimganj College, Karimganj, Assam during 19-21 Sep, 2014.

22. Delivered an **invited talk** “Nanoscience and Nanotechnology” in the DBT sponsored star college workshop on Physics organised by the Department of Physics, Karimganj college, Karimganj, Assam, during 28 Feb. to 2nd March, 2013.

21. Presented a poster entitled “Two peak luminescence from linoleic acid capped gold nanoparticles” in the ICMS-2013 organised by Department of Physics, Tripura University Tripura during 21-23 Feb, 2013.

20. **Oral presentation** on “Synthesis of a few noble metal nanocrystals and their antibacterial activity” in the National Seminar on Green Chemistry and Nanoscience: Theory and application organised by Department of Chemistry, MBB college, Agartala, Tripura during 20-21 July, 2012.

19. Participated in **Workshop on "Scanning Electron Microscopy"**, held at SAIF, NEHU, Shillong, during 27-29 March, 2012.

18. **Oral presentation** on “Gravitational instability of a weakly ionised dusty plasma” in the National seminar on Dusts in Astrophysics 2012, held at Department of Physics, Assam University, Silchar, during 31 Jan.-02 Feb.,2012.

17. **Oral presentation** on “Preparation and Characterization of Copper and Palladium Nanoparticles with Antibacterial Activity of Copper Nanoparticles” in the National conference on Recent trends of Research in Physics, held at Department of Physics, Tripura University, Tripura, during 3- 4th Feb., 2012.

16. **Oral presentation** on “Synthesis of a few noble metal nanoparticles by reduction method to study the optical properties and their application as antibacterial agents” in the National seminar on Frontier of research in Physics, held at Department of Physics, Karimganj College, Assam, during 22-24 Dec, 2011.

15. Participated in poster presentation in **International Conference on Advance Nanomaterials and Nanotechnology**, held at IIT Guwahati, during 8-10th December, 2011. Paper title: "Synthesis and Characterization of Linoleic Acid Capped Palladium Nanoparticles",

14. Delivered an **invited talk** “Nanotechnology” in the Seminar on X-ray Organised by Cachar Cancer Hospital and research center on Nov 12, 2011.

13. Participated in **Winter School on Gravitation and Cosmology (WSGC)**, held at Department of Physics, Assam University, Silchar, Assam, during 5 th Feb-14 th Feb, 2011.

12. **Oral presentation** on “Photoluminescence Study of Silver and Gold Nanoparticles” in the National Seminar on Contemporary Trends of Research in Physical Sciences, held at Department of Physics, G. C. College, Silchar, Assam, during Feb. 11-12, 2011.

11. Presented a poster entitled “UV-Vis and FTIR Spectral Study of Copper and Gold Nanoparticles” in the National Seminar on Current Trends in Condensed Matter Physics (CTCMP-2011) held at Department of Physics, Assam University, Silchar, during 3-5 Feb, 2011.

10. Participated in a poster presentation in the **International conference on nanomaterials and nanotechnology**, held at K.S.R. College of Technology, Tiruchengode, Tamil Nadu, during Dec 13-16, 2010. Paper title: "Characterization of linoleic acid capped copper nanoparticles".

9. Presented a poster entitled “Synthesis of linoleic acid capped silver and copper nanoparticles and their antibacterial activity” in the ICMS-Cambridge University Winter School on International Physics and Chemistry of Materials" held at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, during Dec 06 th -10th, 2010.

8. Presented a poster entitled “Impedance Study of Micron Sized and Nanosized Iron and Copper Particles and Their Mixture” in the National Conference on Condensed Matter Physics (With a focus on Bose Einstein condensation and nanoparticles), held at Department of Physics, NEHU, Shillong, during March 22-23, 2010.

7. **Oral presentation** in National Seminar on Condensed Matter Physics, held at Department of Physics, Tripura University, Tripura, on February 16, 2010. Paper title: "Impedance Analysis of Small Iron and Copper Particles and Their Mixture in Paraffin".

6. **Oral presentation** on “Impedance Analysis of Small Iron and Copper Particles and Their Mixture in Paraffin” in the UGC Sponsored National Seminar on Problems and Prospects of Development in the National North East Region held at S. S. College, Hailakandi, Assam, during 1st -2nd Feb.,2010.

5. Presented a poster entitled “Synthesis of gold nanoparticles and its characterization” in the Indo- Russian Workshop on Nanotechnology International and Laser Induced Plasma, held at Department of Physics, Delhi University, Delhi, during November 24-26, 2009.

4. **Oral presentation** on “Synthesis and Characterization of silver nanoparticles” in the UGC and DST sponsored National Seminar on Recent Progress in Physical Sciences, Organised by Department of Physics, Karimganj College, Karimganj, Assam, during December 20-21, 2008.

3. Participated in a one day workshop on **IUAC acquaintance program**, held at Dept of Physics, NIT, Silchar, Assam on 8th Feb, 2008.

2. Presented a paper entitled “Synthesis and characterization of noble metal Nanoparticles” in the National seminar on Astrophysics with spectroscopic and photometric data, Organised by Dept. of Physics, Assam University, on 1st Feb, 2008.

1. Participated in poster presentation in **National Seminar on Photonics and Quantum Structures**, held at Department of Physics, Tezpur University, Tezpur, Assam during,

November 4-6, 2009. Paper title: "Synthesis of Silver Nanoparticles and Their Characterization",