

CURRICULUM VITAE



1. Name: SATCHIDANANDA RATH
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India
4. E-mail: srath@iitbbs.ac.in, snrath08@gmail.com
5. Nationality: India
6. Marital status: Married
7. Date of Birth: January 11, 1976

8. Professional Experience:

- 2010 - till now** **Assistant Professor**, Faculty of Physics, School of Basic Sciences, Indian Institute of Technology Bhubaneswar, Bhubaneswar-7, India,
- April 2009- Dec.,2009 Visiting scientists, Indira Gandhi Centre for Advance Research, Kalpakkam, Tamil Nadu, India
- April,2007- March,2009 JSPS Post Doctoral Fellows, University of Electro-Communication, Tokyo, Japan.
- Oct. 2006-March, 2007 Post Doctoral Fellows, University of Electro-Communication, Tokyo, Japan
- April,2006- Sept. 2006 Research fellow, Tohoku University, Sendai, Japan
- 2000-2005 Ph D, Institute of Physics, Bhubaneswar, Odisha, India
- 1999-2000 Diploma in Advance Physics, Institute of Physics Bhubaneswar, Odisha

9. ACADEMIC HONORS & AWARDS

- 2007** **Japan Society for Promotion of Science Fellow**

10. INVITED LECTURES & OUTREACH ACTIVITIES

1. “Nanotechnology: A Mesoscopic Revolution” by S. Rath, BJB College Bhubaneswar, 27/10/2016.

11. Teaching Activities [Since 2010 – till 2015]:

Following undergraduate and Post graduate courses have been taught.

(a). Condense Matter Physics	[Post Graduate Level]
(b) Semiconductor Physics	[Post Graduate Level]
(c) Quantum Mechanics	[Undergraduate Level]
(d) Classical Mechanics	[Undergraduate Level]

12. Area of Research

- ❖ *Nanoclusters for molecular electronics Application*
- ❖ *Two-dimensional nanostructure for Energy, Optoelectronics and sensors*
- ❖ *Rheological behavior of soft matter/nanomaterials dispersion*
- ❖ *Study of Ultrafast processes using light Scattering*

In Nanostructure & soft matter research activities, we have been working on research programmes on (1) Growth of nanostructure materials (metal, semiconductor and oxides) different shape and sizes (e.g. nanoclusters, nanosheets etc.) (2) characterization through light scattering, (3) studies of ultrafast processes using femtosecond Laser and (4) rheological properties of nanomaterial dispersion –nanofluid in different solvents and polymer as a function of the external force field to explore on the challenging application of above materials in energy and optoelectronic devices.

13. Laboratory.

The Research Laboratory is equipped with advanced Instruments;

- **Micro Raman set up [T64000 Horiba Raman Spectrometer]**
- **Time resolved Photoluminescence Spectroscopy [Horiba]**
- **Small angle x-ray scattering [Anton Paar]**
- **Rheometer [Anton Paar]**

14. Publication List

(a) In Journal:

1. **S. Rath**, O. Halder, A. Pradhani, B. Satpati, A. Maity, T. Chini, N. Gogurla and S. K. Ray, *White-light emission by phonon assisted coherent mixing of excitons in Au₈-CdS hybrid nanorods*, *Nanotechnology* 27, 496706 (2016).
2. S. R. Mohapatra, B. Sahu, M. Chandrasekhar, P. Kumar, S. D. Kaushik, **S. Rath**, A. K. Singh, *Effect of cobalt substitution on structure, impedance, ferroelectric and magnetic properties of multiferroic Bi₂Fe₄O₉ ceramics*, *Ceram. Int.* 42, 12352 (2016).
3. A. S. Das, M. Roy, D. Roy, **S. Rath** and S. Bhattacharya, *Structural and optical properties of V₂O₅-MnO₃-ZnO glass-nanocomposite system*, *Trans. Ind. Ceram. Soc.* 75, 1 (2016).
4. M. Kumar, R. Singh, S. Nandy, A. Ghosh, **S. Rath** and T. Som, *Tunable optoelectronic properties of pulsed dc sputter-deposited ZnO:Al thin films: Role of growth angle*, **J. Appl. Phys.** 120, 015302 (2016).
5. B. D. Mohapatra, S. P. Mantry, N. Behera, **S. Rath** and K. S. K. Varadwaj, *Simulation of electrocatalytic oxygen reduction activity on nitrogen doped graphene through noncovalent molecular functionalization*, **Chem. Commun** 52, 10385 (2016).
6. A. Pradhani, O. Halder, S. Nozaki and **S. Rath**, *Raman modes, dipole moment and chairality in periodically positioned Au₈ clusters*, **RSC Advances** 5, 65208 – 13 (2015).

7. O.Halder, A. Pradhani, P. K. Sahoo, B. Satpati and **S. Rath**, *Highly luminescent two dimensional excitons in atomically thin CdSe nanosheets*, **Appl. Phys. Lett** *104*, 182109-1-4 (2014).
8. **S. Rath**, S. Nozaki, D. Palagin, V. Matulis, O. Ivashkevich, and S. Maki, *Aqueous-based synthesis of atomic gold clusters: Geometry and optical properties*, **Appl. Phys. Lett** *97*, 053103-1-3 (2010).
9. S. N. Sarangi, **S. Rath**, K. Goswami, S. Nozaki and S. N. Sahu, *DNA template driven CdSe nanowires and nanoparticles: structure and optical properties*, **Physica E** *42*, 1670 (2010) [Impact – 1.85]
10. **S. Rath**, S. N. Sarangi and S. N. Sahu, *XPS studies of the DNA-cations interacted self-assembled HgTe quantum dots formed under electrodeposition and the resultant biomolecular application*, **Nanotechnology** *19*, 115606- 1-7 (2008) [Impact – 3.67].
11. **S. Rath**, S. N. Sarangi and S. N. Sahu, *Biocatalytic growth of semiconductor nanowires*, **J. Appl. Phys.** *101*, 074306-1-5 (2007) [Impact – 2.18].
12. B.K. Patel, **S. Rath**, S. N. Sarangi and S. N. Sahu, *HgS nanoparticles: Structure and optical properties*, **Appl. Phys. A** *86*, 447- 450 (2007) [Impact – 1.69]
13. **S. Rath** and S. N. Sahu, *Electronic structure of HgTe nanocrystals: An observation of p-d weakening*, **Surf. Sci. (Letter)** *600*, L110 - L115 (2006) [Impact – 1.87].
14. B. K. Patel, **S. Rath** and S. N. Sahu, *Surface photovoltage studies of Si nanocrystallites prepared by electrochemical etching*, **Physica E** *33*, 268 – 272 (2006) [Impact – 1.85].

15. **S. Rath**, K. Das, S. N. Sarangi, A. K. Dash, S. K. Ray and S. N. Sahu, *Synthesis of LECBD grown cluster assembled SeO₂ thin films*, **Appl. Surf. Sci.** 253, 2138-2142 (2006) [Impact – 2.53].
16. **S. Rath**, D. Paramanik, S. N. Sarangi, S. Verma and S. N. Sahu, *Surface characterization and electronic structure of HgTe nanocrystalline thin films*, **Phys. Rev. B**, 72, 205410-1-6 (2005) [Impact – 3.66].
17. **S. Rath**, G. B. N. Chainy, S. Nozaki and S. N. Sahu, *DNA template-driven synthesis of HgTe nanoparticles*, **Physica E**, 30, 182-185 (2005) [Impact – 1.85].
18. **S. Rath**, S. N. Sahu, *Mercury telluride nanocrystalline thin films: A Unique photoluminescence in the visible regime*, **J. Metastable and Nanocrystalline Material** 23, 125-128 (2005) [Impact – 1.2].
19. **S. Rath** and S. N. Sahu, *Composition-dependent optical properties of nanocrystalline Mercury telluride*, **Euro Phys. Lett.** 67, 294 - 300 (2004) [Impact – 2.26].
20. **S. Rath**, A. K. Dash, S. N. Sahu and S. Nozaki, *Quantum confinement effect in HgTe nanocrystals and visible luminescence*, **Int. J. Nanoscience** 3, 393-401 (2004) [Impact – 1.5] .
21. **S. Rath**, S. Nozaki, H. Ono, K. Uchida and S. Kojima, *Growth and optical properties of SnO₂ ultra-small nanorods by the novel micelle technique*, **Mater. Res. Soc. Symp. Proc.** 1087, V03-29 (2008).

(b) In Conference papers & proceedings:

22*. **S.Rath**, S. N. Sarangi, S. N. Sahu and S. Nozaki, *HgTe nanoparticles and HgTe-ssDNA nanostars: Novel properties due to size quantization effect*, **Nano-scale Materials: From Science to Technology** (Nova Publishers-2006) Page 291-295.

23*. S. N. Sarangi, J. Nayak, **S. Rath** and S. N. Sahu, *Synthesis and optical properties of DNA tagged CdSe nanocrystals*, **Nano-scale Materials: From Science to Technology** (Nova Publishers-2006) Page 313-319.

24*. S. N. Sahu, **S. Rath**, J. Nayak, A. K. Mahapatra and S. N. Sarangi, *Unique properties of nanostructured semiconductors: Control of size by capping and self-assembly by DNA*, **Nano-scale Materials: From Science to Technology** (Nova Publisher-2006) page 55-62.

25. S. Mathew, B. Joseph, **S. Rath** and B. N. DeV, *Magnetism in C₆₀ films induced by 2 MeV proton irradiation*, **Proceedings of 49th annual DNE SSPS** (2005).

26*. B. K. Patel, S. C. Sahu, S. N. Sarangi, J. Nayak, **S. Rath** and S. N. Sahu, *Nano-phase cubic Mercury sulphide: A transition from Semimetal to semiconductor*, **Science and Technology of Nanostructured materials** (Nova Publishers-2001) page- 223-225.

27. O. Halder and S. Rath, *Power dependent phonon frequency within CdSe and CdMnSe nanosheets*, **AIP conference Proc. 1832**, 090048 (2017).

* **All these articles as published as chapter in the book.**

(d) Papers presented in conference but not published:

28. A.Pradhani and **S. Rath**, *Confinement effect of CdS nanorods grown by solvothermal route* 3rd International conference on Physics at surfaces and interfaces (PSI 2014), IOP Bhubaneswar-2014

29. A.Pradhani and **S. Rath**, *Structural and optical characterization of CdS nanorods synthesized by micelle assisted hydrothermal method*, 1st International conference on scattering & diffraction techniques for Material characterization (ICSDTMC2013), NIT Rourkela – 2013.
30. **S. Rath**, S. N. Sarangi and S. N. Sahu, *Surface, structure and optical characterization of LECBD grown Se and SeO₂ nanoclusters*, **Int. Conf. on MEMS and Semiconductor Nanotechnology**, IIT, Kharagpur, 2005.
31. S. N. Sahu and **S. Rath**, *A new approach to molecular recognition based on DNA quantum dots systems*, **Int. Conf. on MEMS and Semiconductor Nanotechnology**, IIT, Kharagpur, 2005.
32. S. N. Sarangi, **S. Rath**, K. Goswami and S. N. Sahu, *DNA template driven CdSe nanostructures: Optical properties*, **Int. Conf. on MEMS and Semiconductor Nanotechnology**, IIT, Kharagpur, 2005.