DR. BATU GHOSH

Assistant Professor
M. Sc. (Physics), Ph. D.
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» Overview:

Hello I am Batu Ghosh, Assistant Professor from Department of Physics. I love to learn and discus physics. I also enjoy music very much specially Indian classical.

» Date of appointment to the present job:

02/04/2015

» Other Academic/ Administrative post:

- Member of IQAC, T. D. B. College, Raniganj

» Academic background:

I completed my school means higher secondary from Bolpur High School. Then I moved to Kolkata to do graduation (Narendrapur Ramakrishna Mission Residential College) and postgraduate (Calcutta University) in Physics. My specialization on postgraduate was condensed matter physics. Later I entered in PhD program in Physics at IACS, Kolkata. After finishing my PhD program I moved to NIMS, Japan for postdoctoral study. I stayed there for nearly 4 years. Then I joined in this college.

» Information about Ph. D.:

- **Date of Award:** 06/06/2012
- **Ph. D. Topic:** *Electrical characterization and device application of some complex nanostructures.*

» Publications in Journals:

1. Ghosh, B., Sahu, S.; Pal, A.J. 2008. Core− Shell Nanoparticles: An Approach to Enhance Electrical Bistability. J. Phys. Chem. C, 112, 11290–11294. https://pubs.acs.org/doi/abs/10.1021/jp8032963
2. Ghosh, B., Sahu, S.; Pal, A.J. 2008. Core–shell nanotubes to enhance electrical bistability for 2-bit memory. J. Mater. Chem., 18, 4670–4674. https://pubs.rsc.org/en/content/articlelanding/2008/jm/b807253a#!divAbstract
3. Ghosh, B., Pal, A.J. 2009. Conductance switching in TiO2 nanorods is a redox-driven process: evidence from photovoltaic parameters. J. Phys. Chem. C, 113, 18391–18395. https://pubs.acs.org/doi/full/10.1021/jp908187a
4. Ghosh, B., Pal, A.J. 2010.Transport Gap vis-à-vis Electrical Bistability of Alloyed Zn x Cd1− x S (x= 0 to 1) Quantum Dots. J. Phys. Chem. C, 114, 13583–13588. https://pubs.acs.org/doi/abs/10.1021/jp1048056
5. Ghosh, B., Das, B.C.; Pal, A.J. 2010.Transport Gap of Nanoparticle-Passivated Silicon Substrates. Small, 6, 52–57. https://onlinelibrary.wiley.com/doi/abs/10.1002/smll.200901327
6. Ghosh, B., Pal, A.J. 2011. Controlled electrostatic assembly of quantum dots vis-à-vis their electronic coupling and transport gap. Phys. Chem. Chem. Phys., 13, 9194–9200.

https://pubs.rsc.org/en/content/articlelanding/2011/cp/c0cp02729d/unauth#!divAbstract

7. Ghosh, B., Pal, A.J. 2011. Al-doped ZnO nanocrystals: Electronic states through scanning tunneling spectroscopy. J. Appl. Phys., 110, 104303. https://aip.scitation.org/doi/abs/10.1063/1.3662104?ver=pdfcov&journalCode=jap
8. Bhaumik, S., Ghosh, B.; Pal, A.J. 2011. Color tunable light-emitting diodes based on copper doped semiconducting nanocrystals. Appl. Phys. Lett., 99, 2009–2012. https://aip.scitation.org/doi/10.1063/1.3626855
9. Bhaumik, S.; Ghosh, B.; Pal, A.J. 2012. Pulsed Electroluminescence from Quantum Dot Light-Emitting Diodes. Nanosci. Nanotechnol. Lett., 4, 783–789. https://www.researchgate.net/publication/236015060_Pulsed_Electroluminescence_from_Quantum_Dot_Light-Emitting_Diodes
10. Ghosh, B., Ogawara, M.; Sakka, Y.; Shirahata, N. 2012. White-light-emitting liquefiable silicon nanocrystals. Chem. Lett., 41, 1157–1159. https://www.journal.csj.jp/doi/abs/10.1246/cl.2012.1157
11. Zhou, J., Shirahata, N.; Sun, H.-T.; Ghosh, B.; Ogawara, M.; Teng, Y.; Zhou, S.; Sa Chu, R.G.; Fujii, M.; Qiu, J. 2013. Efficient dual-modal NIR-to-NIR emission of rare earth ions co-doped nanocrystals for biological fluorescence imaging. J. Phys. Chem. Lett., 4, 402–408. https://pubs.acs.org/doi/10.1021/jz302122a
12. Ghosh, B., Sakka, Y.; Shirahata, N. 2013. Efficient green-luminescent germanium nanocrystals. J. Mater. Chem. A, 1, 3747–3751. https://pubs.rsc.org/en/content/articlelanding/2013/ta/c3ta01246h#!divAbstract
13. Sahu, S., Ghosh, S.; Ghosh, B.; Aswani, K.; Hirata, K.; Fujita, D.; Bandyopadhyay, A. 2013. Atomic water channel controlling remarkable properties of a single brain microtubule: correlating single protein to its supramolecular assembly. Biosens. Bioelectron., 47, 141–148. https://www.sciencedirect.com/science/article/pii/S0956566313001590
14. Ghosh, B., Shirahata, N. 2014. Colloidal silicon quantum dots: synthesis and luminescence tuning from the near-UV to the near-IR range. Sci. Technol. Adv. Mater., 15, 14207. https://iopscience.iop.org/article/10.1088/1468-6996/15/1/014207/meta
15. Ghosh, B., Ogawara, M.; Sakka, Y.; Shirahata, N. 2014. Reductant-Free Colloidal Synthesis of Near-IR Emitting Germanium Nanocrystals: Role of Primary Amine. J. Nanosci. Nanotechnol., 14, 2204–2210. https://pubmed.ncbi.nlm.nih.gov/24745213/
16. Ghosh, B., Masuda, Y.; Wakayama, Y.; Imanaka, Y.; Inoue, J. i.; Hashi, K.; Deguchi, K.; Yamada, H.; Sakka, Y.; Ohki, S. 2014. Hybrid White Light Emitting Diode Based on Silicon Nanocrystals. Adv. Funct. Mater., 24, 7151. https://onlinelibrary.wiley.com/doi/abs/10.1002/adfm.201401795
17. Ghosh, B., Takeguchi, M.; Nakamura, J.; Nemoto, Y.; Hamaoka, T.; Chandra, S.; Shirahata, N. 2016. Origin of the photoluminescence quantum yields enhanced by alkane-termination of freestanding silicon nanocrystals: temperature-dependence of optical properties. Sci. Rep., 6, 1–11. https://www.nature.com/articles/srep36951
18. Chandra, S., Ghosh, B.; Beaune, G.; Nagarajan, U.; Yasui, T.; Nakamura, J.; Tsuruoka, T.; Baba, Y.; Shirahata, N.; Winnik, F.M. 2016. Functional Double-Shelled Silicon Nanocrystals for Two-Photon Fluorescence Cell Imaging: Spectral Evolution and Tuning. Nanoscale, 8, 9009.

https://pubs.rsc.org/en/content/articlelanding/2016/nr/c6nr01437b#!divAbstract

19. Ghosh, B., Yamada, H.; Chinnathambi, S.; Özbilgin, İ.N.G.; Shirahata, N. 2018. Inverted Device Architecture for Enhanced Performance of Flexible Silicon Quantum Dot Light-Emitting Diode. J. Phys. Chem. Lett., 9, 5400–5407. https://pubs.acs.org/doi/10.1021/acs.jpclett.8b02278
20. Ghosh, B., Hamaoka, T.; Nemoto, Y.; Takeguchi, M.; Shirahata, N. 2018. Impact of Anchoring Monolayers on the Enhancement of Radiative Recombination in Light-Emitting Diodes Based on Silicon Nanocrystals. J. Phys. Chem. C, 122, 6422. https://pubs.acs.org/doi/10.1021/acs.jpcc.7b12812
21. Ghosh, B., Shirahata, N. 2019. All-Inorganic Red-Light Emitting Diodes Based on Silicon Quantum Dots. Crystals, 9, 385. https://www.mdpi.com/2073-4352/9/8/385
22. Saw, M.J., Ghosh, B.; Nguyen, M.T.; Jirasattayaporn, K.; Kheawhom, S.; Shirahata, N.; Yonezawa, T. 2019. High Aspect Ratio and Post-Processing Free Silver Nanowires as Top Electrodes for Inverted-Structured Photodiodes. ACS omega, 4, 13303–13308. https://pubs.acs.org/doi/full/10.1021/acsomega.9b01479
23. Shirahata, N., Nakamura, J.; Inoue, J.I.; Ghosh, B.; Nemoto, K.; Nemoto, Y.; Takeguchi, M.; Masuda, Y.; Tanaka, M.; Ozin, G.A. 2020. Emerging Atomic Energy Levels in Zero-Dimensional Silicon Quantum Dots. Nano Lett., 20, 1491–1498. https://pubs.acs.org/doi/10.1021/acs.nanolett.9b03157
24. Ghosh, B., Shirahata, N. 2020. Influence of Oxidation on Temperature-Dependent Photoluminescence Properties of Hydrogen-Terminated Silicon Nanocrystals. Crystals, 10, 143. https://www.mdpi.com/2073-4352/10/3/143
25. H Yamada, N Saitoh, B Ghosh, Y Masuda, N Yoshizawa, N Shirahata. 2020. Improved Brightness and Color Tunability of Solution-Processed Silicon Quantum Dot Light-Emitting Diodes, The Journal of Physical Chemistry C 124 (42), 23333-23342 https://pubs.acs.org/doi/abs/10.1021/acs.jpcc.0c06672
26. ING Özbilgin, B Ghosh, H Yamada, N Shirahata. 2021. Size-dependent photothermal performance of silicon quantum dots The Journal of Physical Chemistry C 125 (6), 3421-3431 https://pubs.acs.org/doi/abs/10.1021/acs.jpcc.0c10027

» Seminars, Conferences, Webinars and Workshops attended:

- Seminars/ Conferences/ Workshops: 02
- Webinar: 00

» Life Membership:

NA

» Awards/Academic Achievements:

- Awarded JSPS long term fellowship for Collaborative research work in National Institute for material science, Tsukuba, Japan.

» Professional Courses:

- Orientation Programme/FIP/FDP: 01
- Refresher Course: 02
- Short Term Course: 00