

Dr. Somik Banerjee's Profile

- 1) Name: **Dr. Somik Banerjee**
2) Designation: **Assistant Professor**
3) Contact No. & Email id: **9435714427 (Mobile),
somikbnrj@gmail.com (e-mail)**
4) Educational Qualifications:



Degree	Year	University	Div/Class	Specialization
B.Sc.	2005	Gauhati University	1 st Class 1 st	Physics
M. Sc	2007	Tezpur University	1 st Class 1 st (Gold Medalist)	Condensed Matter Physics and Materials Science
Ph.D.	2012	Tezpur University	CGPA: 8.2 (Course work)	Physics (Spl: Nanoscience and Technology, Polymer Science)

Title of the Thesis (M. Phil/PhD/ Both):

"Synthesis, SHI irradiation and Characterization of conducting polymer based nanostructured materials for biomedical and sensor applications"
<http://ir.inflibnet.ac.in:8080/jspui/handle/10603/9003>

5) Teaching Experience in year(s): 03

Previous: **1 Year (September 06, 2012-September 30, 2013, Assistant Professor in Girijananda Institute of Management and Technology)**

Current: **Assistant Professor at the Department of Physics, B. Borooah College since October 09, 2013 till date.**

6) Area (s) of Interest: **Experimental Condensed Matter Physics, Nanoscience and Nanotechnology, Materials Science, Device fabrication, optimization and characterization, Physics of Ion-Polymer interactions**

7) Publication(s):

Refereed National/International Journals: 24
Book Chapters with ISSN, ISBN no's: 05
Conferences, Symposium, Seminars and Workshops attended: 14

List of Publications

A) Research Paper (s) (peer reviewed national/international journal):

(i) Research Paper in peer reviewed International Journals

1. A Kumar, M Deka, **S Banerjee**, S Sarmah, Recent Trends in Electroactive Polymer Nanocomposites and Swift Heavy Ion Irradiation effects on them, **Invertis Journal of Renewable Energy** 5 (1), 11-29
2. Rajiv Bora, **Somik Banerjee** and A. Kumar, Surface functionalization effects on structural, conformational, and optical properties of polyaniline nanofibers, **Synthetic Metals**, 197 (2014) 225-232.
3. **Somik Banerjee**, D. Konwar and A. Kumar, "Polyaniline nanofiber reinforced nanocomposite based highly sensitive piezoelectric sensors for selective detection of hydrochloric acid: Analysis of response mechanism", **Sensors and Actuators B: Chemical** 190 (2014) 199-207.
4. **Somik Banerjee**, M. Deka, A. Kumar and Udayan De, "Review: Ion Irradiation Effects in some Electro-active and Engineering Polymers: Studies by Conventional and Novel Techniques", **Defect and Diffusion Forum** 341 (2013) 1-49.
5. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced structural, optical and conformational modifications in conducting polymer nanostructures" **Advanced Materials Letters** 4 (2013) 433-437.
6. **Somik Banerjee** and A. Kumar, "Relaxation and charge transport phenomena in polyaniline nanofibers: Swift heavy ion irradiation effects" **Journal of Non-Crystalline Solids**, 358 (2012) 2990-2998.
7. **Somik Banerjee**, D. Konwar and A. Kumar, "Polyaniline nanofiber reinforced nanocomposite coated quartz crystal microbalance based free radical sensor", **Sensors and Actuators B: Chemical**, 171-172 (2012) 924-931. (Citations: 01)
8. Sujata Pramanik, N. Karak, **Somik Banerjee** and A. Kumar, "Effects of solvent interactions on the structure and properties of prepared polyaniline nanofibers", **Journal of Applied Polymer Science**, 126 (2012) 830-836. (Citations: 03)
9. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced modifications in the Optical band-gap and Urbach's tail in polyaniline nanofibers", **Nucl. Instr. and Meth. B**, 269 (2011) 2798.
10. A. Kumar and **Somik Banerjee**, "Swift heavy ion irradiation: A novel technique for tailoring the size of polyaniline nanofibers" **Int. J. Nanosci.**, 10 (1-2), (2011), 161.
11. **Somik Banerjee** and A. Kumar, "Dielectric spectroscopy for probing the relaxation and charge transport in polypyrrolene nanofibers", **J. Appl. Phys.** 109 (2011), 114313.
12. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced structural and conformational changes in polypyrrolene nanofibers", **Radiation Effects and Defects in Solids**, 166 (8-9) (2011) 598-605.
13. Jyoti P Saikia, **Somik Banerjee**, B. K. Konwar and A. Kumar, "Biocompatible novel starch/polyaniline composites: Characterization, anticytotoxicity and antioxidant activity", **Colloids and Surfaces B: Biointerfaces**, 81 (2010) 158.

14. **Somik Banerjee** and A. Kumar, "Micro-Raman investigation of the structural and conformational changes in polyaniline nanofibers", *Nucl. Instr. and Meth. B*, **268** (2010) 2683.
15. A. Kumar, **Somik Banerjee**, J.P. Saikia and B. K. Konwar, "Swift heavy ion irradiation induced enhancement in the antioxidant activity and biocompatibility of polyaniline nanofibers" *Nanotechnology*, **21** (2010) 175102.
 - i. Highlighted by Nature India "Heavy ion bath" (doi:10.1038/nindia.2010.52)
 - ii. Highlighted in nanotechweb "Engineering the properties of electroactive polymers" <http://nanotechweb.org/cws/article/lab/42605>
16. A. Kumar, M. Deka and **Somik Banerjee**, "Enhanced ionic conductivity in oxygen ion irradiated poly(vinylidene fluoride-hexafluoropropylene) based nanocomposite gel polymer electrolytes" *Solid State Ionics*, **181** (2010) 609.
17. **Somik Banerjee** and A. Kumar, "Dielectric properties and charge transport in polyaniline nanofiber reinforced PMMA composites" *J. Phys. Chem. Solids*, **71** (2010) 381.
18. **Somik Banerjee**, Jyoti P Saikia, A. Kumar and B. K. Konwar; "Antioxidant activity and haemolysis prevention efficiency of polyaniline nanofibers" *Nanotechnology*, **21** (2010) 045101.
19. **Somik Banerjee**, Smritimala Sarmah and Ashok Kumar; "Photoluminescence in HCl doped polyaniline nanofibers" *Journal of Optics.*, **38(2)** (2009), 124.
20. Smritimala Sarmah, **Somik Banerjee**, Ashok Kumar; "Ion Transport in Dedoped Polyaniline Nanofiber-P(VDF-HFP)-LiCF₃SO₃ Composite Electrolyte" *J. Polym. Mater.*, **25(3)** (2008) 427.
21. A. Kumar and **Somik Banerjee**, "Size Dependent Antioxidant Activity of Polypyrrole Nanofibers", *Proceedings of the 55th DAE Solid State Symposium-2011, AIP Conference Proceedings*, 1349, 399-400, 2011
22. Smritimala Sarmah, **Somik Banerjee** and A. Kumar, *Proceedings of the XXXII Optical Society of India Symposium*, Eds. P. P. Sahu and P. Deb, pp. 63.

(ii) Research Paper in peer reviewed National Journals

1. **Somik Banerjee**, One dimensional (1D) Polyaniline Nanostructures: Synthesis, Properties and Applications, *Bull. Phys. Proj.*, **1** (2016) 1-9.
2. **Pritom Singh, Jayanta Das and S. Banerjee**, Study of Fraunhofer Diffraction Patterns for Different Slits and Measurement of Hair Diameter Using Diffraction Phenomena, *Bull. Phys. Proj.*, **1** (2016) 24-28.

B) Book Chapters (with ISSN, ISBN Nos:)

1. A. Kumar, **Somik Banerjee** and Smritimala Sarmah, "Ionic transport in dedoped (insulating) Polyaniline nanofiber dispersed composite polymer electrolytes" *Developments in Nanocomposites*, Kamal K Kar, A. Hodzic (Eds.), Ch 18, pp 1-22, ISBN: 978-981-08-3711-2 (in press) Publisher: Research Publishing Services
2. **Somik Banerjee** and A Kumar, "A comparative study of Type I redox supercapacitors based upon polyaniline bulk and nanofiber electrodes", *Renewable Energy and Sustainable Development*, Rupam Katak and Anil C Borah (Eds.), Ch. 41, pp 463-472, 2012, ISBN No: 978-93-80261-78-2, Publisher: EBH Publisher (India)

3. A. Kumar and **Somik Banerjee**, "Swift heavy ion irradiation induced strain generation and fragmentation in polyaniline nanofibers" *Photonics and Quantum structures*, D. Mohanta, Gazi. A. Ahmed (Eds.) Ch-10, pp 93-101, 2012, ISBN: 978-81-8487-098-5, Publisher: Narosa Publishing House (India)
4. A. Kumar and **Somik Banerjee**, "Conducting polymers: Intelligent functional systems" *Photonics and Quantum structures*, D. Mohanta, Gazi. A. Ahmed (Eds.) Ch-5, pp 47-57, 2012, ISBN: 978-81-8487-098-5, Publisher: Narosa Publishing House (India)
5. A. Kumar, **Somik Banerjee** and M. Deka, "Electron microscopy for understanding swift heavy ion irradiation effects on Electroactive polymers", *Microscopy Book Series. IV, Vol 3*, A. Méndez-Vilas and L. Labajos-Broncano (Eds.) pp-1755-1768, 2010, ISBN (13): 978-84-614-6191-2, Publisher: Formatex.

8) Conference/Seminar/Workshop/Symposium (Participation/Paper Presentation)

1. Somik Banerjee and A. Kumar, "Tailoring the physico-chemical properties of conducting polymer nanostructures by heavy ion bath for biomedical applications", IUAC Acquaintance programme organized by Gauhati University, Assam, India, 2015.
2. **Somik Banerjee** and A. Kumar, "Energy efficient actuators based on polyaniline nanofiber reinforced PVA nanocomposites", International Congress on Renewable Energy (ICORE-2011), Tezpur University, Tezpur, Assam, India, 2-4 November, 2011.
3. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced physico-chemical modifications in one dimensional conducting polymer nanostructures", *Nuclear and Atomic Techniques in Pure and Applied Sciences (NATPAS-2011)*, Tezpur University, Tezpur, Assam, India, 1-3 February, 2011
4. **Somik Banerjee** and A. Kumar, "Polyaniline nanofiber reinforced PVA nanocomposite based bilayer actuators", *National Conference on Smart Nanostructures (NCSN-2011)*, Tezpur University, Tezpur, India, 18-20 January, 2011.
5. **Somik Banerjee** and A. Kumar, "Applications of conducting polymer nanostructures as free-radical scavengers", *International Conference on Fundamentals and Applications of Nanoscience and Technology (ICFANT-2010)*, Jadavpur University, Kolkata, India, 9-11 Dec, 2010.
6. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced structural and conformational changes in polypyrrolen nanofibers", *Swift Heavy Ions for Materials Engineering and Characterization (SHIMEC-2010)*, Inter University Accelerator Centre (IUAC), New Delhi, India, October 6-9, 2010
7. **Somik Banerjee** and A. Kumar, "A comparative study of type-I redox supercapacitors fabricated using polyaniline bulk and nanofibers electrodes", *National Conference on Renewable Energy at Tezpur University, Assam, India, March 23-25, 2010.*
8. **Somik Banerjee**, Meghraj Adhikary and A. Kumar, "Effect of surfactant concentration on the structure and properties of polypyrrole nanowires", *National Conference on Condensed Matter Physics at NEHU, Shillong, Meghalaya, India, March 22-23, 2010.*
9. **Somik Banerjee** and A. Kumar, "Polyaniline nanofibers as potential antioxidants for biomedical and industrial applications", *International Conference on Advanced Nanomaterials and Nanotechnology (ICANN) at IIT Guwahati, Assam, India, Dec 9-11, 2009.*
10. A. Kumar and **Somik Banerjee**, "Swift heavy ion irradiation: A novel technique for tailoring the size of polyaniline nanofibers", *International Conference on Advanced Nanomaterials and Nanotechnology (ICANN) at IIT Guwahati, Assam, India, Dec 9-11, 2009.*

11. **Somik Banerjee** and A. Kumar, "Swift heavy ion irradiation induced strain development and fragmentation in polyanilinenanofibers", *National Seminar on Photonics and Quantum Structures at Tezpur University, Assam, India, November 4-6, 2009.*
12. A. Kumar and **Somik Banerjee**, "Conducting Polymers: Intelligent material systems", *National Seminar on Photonics and Quantum Structures at Tezpur University, Assam, India, November 4-6, 2009.*
13. **Somik Banerjee**, A. Kumar and D. K. Avasthi, "90 MeV O⁷⁺ ion irradiation effects on polyanilinenanofibers", *Condensed matter Days (CM Days) at Jadavpur University, Kolkata, India, 26-28 August, 2009.*
14. Smritimala Sarmah, **Somik Banerjee** and A. Kumar, "Photoluminescence studies in HCl doped polyaniline nanofibers", *XXXIII Symposium of the Optical society of India at Tezpur University, Assam, India*

9) Orientation/Refresher Course attended:

Type of Course	Topic/Title	Organizing Agency
Refresher Course	Advanced Quantum Mechanics and Quantum Field Theory	Indian Academy of Sciences in collaboration with Tezpur University
GIAN Course	Biosensors: Technology and Applications	Tezpur University

10) Award/Distinction:

- Awarded **D.S. Kothari Post Doctoral Fellowship (DSKPDF)** from U.G.C. in 2012
- Qualified **SET (State Level Eligibility Test)** in 2012 post Ph.D.
- **2011-2012: Senior Research Fellowship (S.R.F.)** from the **Department of Science and Technology, Govt. of India.**
- **2009-2011: Junior Research Fellowship (J.R.F.)** from the **Department of Science and Technology, Govt. of India.**
- **2008-2009: UGC Research Fellowships for Meritorious students** from University Grants Commission (UGC), Ministry of Human Resource and Development (**MHRD**), Govt. of India.
- **2007-2008: Institute Fellowship** from Tezpur (Central) University, Assam, India.
- **1st Class 1st (Gold medalist)** in **M.Sc. Physics** from Tezpur University in 2007.
- 2005-2007: **UGC Post Graduate Merit Scholarship** for University Rank Holders from U.G.C., M.H.R.D., Govt. of India.
- **1st Class 1st in B.Sc. (Physics Honours)** from **Gauhati University** in 2005.

11) Research Project: **Applied for**

12) Professional Membership: **Nil**

13) Other Activity:

I am greatly interested in performing arts that include Mime, Theatre etc. Some of my noted performances are in

- (a) *Gajpuria*, a play written and directed by Late Dipak Mahanta, staged in Rabindra Bhavan, Guwahati, Assam, India
- (b) *Teezemola*, a play written by Sri Debajeet Bora and directed by Dr. Himjyoti Dutta, staged in KBR auditorium, Tezpur University.
- (c) *Tongighar*, a play written and directed by Prof. Amarjyoti Choudhury, staged in KBR auditorium, Tezpur University.
- (d) *Bhotaramor Sapun*, a play originally written by Sri Chandrasekhar Kambara and adopted to Assamese by Sri Dipak Mahanta and directed by Sri Dipak Mahanta, staged in Mysore and Bangalore in Inter University Theatre festival.