



TUSHAR GHOSH

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Past:

Research Associate
Department of Solid State Physics,
Indian Association for the Cultivation of Science,
Raja S. C. Mullick Road, Jadavpur,
Kolkata - 700 032, India.

♣ PERSONAL DETAILS

- Name: Tushar Ghosh
- Date of Birth: 8th March, 1984.
- Nationality: Indian

♣ EDUCATION

- 2012 Ph. D. Degree in Physics (12th November, 2012)
(University of Calcutta, India).
- 2007 M. Sc. Degree in Physics (Specialization:
Condensed Matter Physics), First class with distinction
(University of North Bengal, India).
- 2005 B. Sc. (Honours) Degree in Physics, First class
(University of North Bengal, India).

♣ ACADEMIC AWARDS

- Awarded Senior Research Fellowship by Indian Association for the Cultivation of Science (DST), New Delhi, India (2011-present).
- Awarded Senior Research Fellowship by Department of Science and Technology (DST), New Delhi, India (2010-2011).
- Awarded Junior Research Fellowship by Department of Science and Technology (DST), New Delhi, India (2008-2010).
- Qualified in National Eligibility Test in Physics (NET) Examination.
- Qualified in Graduate Aptitude Test in Engineering (GATE) Examination (2007, 2008).
- Awarded National Scholarship, Govt. of India, for entire education life including B.Sc. and M.Sc degree course (2000).

♣ DISSERTATION

Studies On Undoped And Doped ZnO Thin Films Grown By Sol-Gel And Magnetron Sputtering Techniques

Advisor:

Prof. Durga Basak.
Department of Solid State Physics,
Indian Association for the Cultivation of Science
Webpage: <http://www.iacs.res.in/ssp/sspdb/>

♣ RESEARCH INTERESTS

- Optical, optoelectrical properties and applications of nanoparticles/onedimensional nanostructure and thin films.
- Conduction mechanism and transport properties of 1D nanostructure and nanocolumnar thin films.
- Exploration of novel material and phenomena for optoelectronics.
- Surface physics and structural analysis.
- One-dimensional nanostructure and thin films based photovoltaic specially used as the transparent conducting.

♣ Instrumental and Experimental SKILLS

- **XPS** (Omicron Nanotechnology) handling and operation.
- **XRD** (Scifert P1000) handling and operation.
- **RF and DC magnetron sputtering system** (Rocky Mountain Vacuum Tech.) handling and operation.
- Experience in sample transfer in **UHV** system.
- Vacuum evaporation system (Hind Hivac) handling and operation, HALL, UV/VIS/NIR spectrophotometer, Photoluminescence spectrophotometer (JobinYvon), Photoconductivity, High temperature tube furnace, spin coating unit, Field Emission Scanning Electron Microscope (FESEM), Transmission Electron Microscope (TEM), Electron paramagnetic Resonance (EPR), Medium speed centrifuge, Time correlated single photon counting (TCSPC) spectrometer etc. operation.
- A firsthand experience in synthesis of high quality nanoparticles, nanorods, nanowires by chemical synthesis method. Zinc Oxide, Zinc Sulphide, Copper Oxide, Titanium Oxide, Gold and Silver etc. nanomaterials have been prepared by above said processes.
- Knowledge of BASIC programming such as Fortran 77, 95, Visual Basic, C, C++.
- Knowledge of electrometer operation using Visual Basic.

SCI Journal Papers (Published/ in press)

- **SCI International Journal Papers: 17**(accepted) and 2 pipelines.
- **International / National Conferences: 7**

2009

1. **T. Ghosh**, D. Basak , “Effect of Cu-Li Co-Doping on the Structural, Optical, and Optoelectronic Properties of Sol-Gel ZnO Thin Films”, *Journal of the Electrochemical Society*, **156** (12), H916-H920, 2009.
2. **T. Ghosh**, D. Basak, “Highly enhanced ultraviolet photoresponse property in Cu-doped and Cu-Li co-doped ZnO films”, *Journal of Physics D: Applied Physics*, **42**, 145304, 2009.
3. **T. Ghosh**, M. Dutta, S. Mridha, D. Basak, “Effect of Cu Doping in the Structural, Electrical, Optical, and Optoelectronic Properties of Sol-Gel ZnO Thin Films”, *Journal of the Electrochemical Society*, **156** (4), H285-H289, 2009.
4. M. Dutta, **T. Ghosh**, D. Basak, “N Doping and Al-N Co-doping in Sol-Gel ZnO Films: Studies of Their Structural, Electrical, Optical, and Photoconductive Properties”, *Journal of Electronic Materials*, **38** (11), 2335-2342, 2009.

2010

5. **T. Ghosh**, D. Basak, “Highly efficient ultraviolet photodetection in nanocolumnar RF sputtered ZnO films: a comparison between sputtered, sol-gel and aqueous chemically grown nanostructures”, *Nanotechnology*, **21**, 375202, 2010.

6. A. Bera, **T. Ghosh**, D. Basak, “Enhanced Photoluminescence and Photoconductivity of ZnO Nanowires with Sputtered Zn”, *ACS Applied materials and Interfaces*, **2**, 2898-2903, 2010.

2011

7. **T. Ghosh**, M. Dutta, D. Basak, “Effect of substrate-induced strain on the morphological, electrical, optical and photoconductive properties of RF magnetron sputtered ZnO thin films”, *Material Research Bullitine*, **46**, 1039, 2011.
8. **T. Ghosh**, D. Basak, “Effect of oxygen flow rate and radio-frequency power on the photoconductivity of highly ultraviolet sensitive ZnO thin films grown by magnetron sputtering technique”, *Material Research Bullitine*, **46**, 1975, 2011.
9. **T. Ghosh**, D. Basak, “Nonvolatile memory effect in Au/Cu-ZnO/p-Si type of metal-insulator-semiconductor structure”, *IEEE Electron Device Letters*, **32**, 1746-1748, 2011.
10. M. Mohanti, **T. Ghosh**, D. Basak, “Enhanced near band edge luminescence of Ti/ZnO nanorods heterostructure due to surface diffusion of Ti”, *Nanoscale*, **3**, 4427-4433, 2011.

2012

11. **T. Ghosh**, D. Basak, “Controlling the electrical property of highly transparent conducting film of Zn coated Al doped ZnO by mechano-chemical pathway of face-to-face annealing”, *Chem. Phys. Lett.*, **528**, 68-71, 2012.
12. **T. Ghosh**, D. Basak, “Improved Electrical Transport Properties In p-type ZnO Film By Rapid Dark Thermal Annealing Process”, *AIP Conf. Proc.*, **1447**, 637, 2012.
13. M. Dutta, S. Sarkar, **T. Ghosh**, D. Basak, “ZnO/Graphene Quantum Dot Solid-State Solar Cell”, *J. Phys. Chem. C*, **116**, 20127, 2012.

2013

14. **T. Ghosh**, D. Basak, “Enhanced mobility in visible-to-near infrared transparent Al-doped ZnO films”, *Solar Energy*, **96**, 152-158, 2013. **Impact Factor: 3.569. ISSN: 0038-092X.**

2014

15. A. Mallick, A. Kole, **T. Ghosh**, P. Chaudhuri, D. Basak, “Zinc aluminate spinel impurity phase in Al doped ZnO ceramic target and pulsed laser ablated films: Curse or blessing?”, *Solar Energy*, **108**, 80-87, 2014. **Impact Factor: 3.569. ISSN: 0038-092X.**

2015

16. 12. A. Mallick, S. Sarkar, **T. Ghosh**, D. Basak, “An insight into doping mechanism in Sn-F co-doped transparent conducting ZnO films by correlating structural, electrical and optical properties”, *Journal of Alloys and Compounds*, **646**, 56-62, 2015. **Impact Factor: 2.999. ISSN: 0925-8388.**

2016

17. Aparajita Mandal, Arindam Kole, **Tushar Ghosh**, Durga Basak and Partha Chaudhuri, “An insight into doping mechanism in Sn-F co-doped transparent conducting ZnO films by correlating structural, electrical and optical properties”, *31st European Photovoltaic Solar Energy Conference and Exhibition*, **646**, 210-215, 2016. DOI: 10.4229/EUPVSEC20152015-1BV.7.25

Presentations/Invited lectures in Seminars/Conferences:

1. **T. Ghosh***, M. Dutta, S. Mridha, D. Basak, “Effect of Cu Doping in Sol-Gel ZnO Films”, *53rd DAE Solid State Physics Symposium*, Dec 16-20, 2008 (BARC, Mumbai, India), p. 675-676 in Book of Abstracts. (* Presenting author of the Poster Presentation).
2. **T. Ghosh***, M. Dutta, D. Basak, “Cu-doped Sol-Gel ZnO Thin Films: Structural, Electrical, Optical and Optoelectronic Studies”, *National Conference on 20th Annual General Meeting, MRSI (MRSI-AGM 09)*, Feb 10-12, 2009 (Kolkata, India), Materials Research Society of India (MRSI), p. 76 in Book of Abstracts. (* Presenting author of the Poster Presentation).
3. **Tushar Ghosh*** and Durga Basak, “Highly efficient ultraviolet photodetection in nanocolumnar RF sputtered ZnO films: a low cost solution to the problem”, Dec 9-11, 2010, *International Conference on Fundamental and Applications of Nanoscience and Technology (ICFANT 2010)* (* Presenting author of the Poster Presentation).
4. **Tushar Ghosh*** and Durga Basak, “Highly enhanced ultraviolet photoresponse property in Cu-doped and Cu-Li co-doped ZnO films: a low cost solution to the problem”, July 29, 2009 (Kolkata, India), one day seminar, Indian Association for the Cultivation of Science. (* Presenting author of the Poster Presentation).
5. **T. Ghosh***, D. Basak, “Improved Electrical Transport Properties In p-type ZnO Film By Rapid Dark Thermal Annealing Process”, *56th DAE Solid State Physics Symposium*, Dec 19-23, 2011 (SRM University, Chennai, India). (* Presenting author of the Poster Presentation).
6. **T. Ghosh***, D. Basak, “Enhanced Electrical Transport Property and up to Near-Infrared Transparent Metal (Zn) Semiconducting (Al-Doped ZnO) Layered thin film”, *3rd International Conference on Physics at Surface and Interfaces (PSI2014)*, Feb 23-28, 2014 (Blue Lilly Beach Resort, Puri, Orissa, India). (* Presenting author of the Poster Presentation).
7. Aparajita Mandal, Arindam Kole, **Tushar Ghosh**, Durga Basak and Partha Chaudhuri, “An insight into doping mechanism in Sn-F co-doped transparent conducting ZnO films by correlating structural, electrical and optical properties”, *31st European Photovoltaic Solar Energy Conference and Exhibition*, Sep, 2015, Hamburg; Germany.