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# Amritendu Roy

School of Minerals, Metallurgical and Materials Engineering  
Indian Institute of Technology, Bhubaneswar  
Orissa-751013, India

Tel.- +91-9451018914  
Email: [tendur@gmail.com](mailto:tendur@gmail.com)

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## Professional Experience

- 02/2014- Present** Assistant Professor, School of Minerals, Metallurgical & Materials Engineering, Indian Institute of Technology Bhubaneswar, India
- 08/2013- 12/2013** Assistant Professor, School of Physics & Materials Science, Thapar University, Patiala, India
- 02/2013- 06/2013** Postdoctoral Associate, Department of Mechanical Engineering, Virginia Tech., Blacksburg, VA 24061, USA
- 08/2012-01/2013** Senior Project Associate, Department of Physics, Indian Institute of Technology, Kanpur, India
- 06/2003-12/2004** Graduate Engineer Trainee, Steel Making Plant, Essar Steel Ltd., Hazira, Surat, India

## Education

- 11/2012** Ph. D (Materials Science & Engineering), Indian Institute of Technology, Kanpur, India
- 12/2006** Master of Technology (Materials and Metallurgical Engineering), Indian Institute of Technology, Kanpur, India
- 05/2003** Bachelor of Engineering (Metallurgical Engineering), Regional Engineering College (NIT), Durgapur, India

## Awards and Honors

1. Academic Excellence Award in IIT Kanpur, India in 2005-06.
2. Letter of appreciation and cash award from ESSAR Steel Ltd. for the success of the project "Upgradation of Operational Efficiency for Enhanced Productivity at Steel Melt Shop, Essar Steel Ltd. Hazira, India in 2004.

## Research Interest

(i) Structure-property correlations in functional oxides, (ii) First-principles density functional theory based calculations in ferroic oxides, (iii) Piezoelectric and ferroelectric ceramics, single crystals and thin films, (iv) Multiferroic and magnetoelectric oxides, (v) Thin film heterostructures based on ferroelectrics and multiferroics, (vi) Energy harvesting using ferroic oxides, (vii) multiferroic nanostructures, (viii) Band gap engineering in ferroic oxides for prospective photovoltaic applications.

## List of Publications †

- 1) Room Temperature Nanoscale Ferroelectricity in Magnetoelectric GaFeO<sub>3</sub> Epitaxial Thin Films Somdutta Mukherjee, **Amritendu Roy**, Rajeev Gupta, Rajendra Prasad, Sushil Auluck and Ashish Garg, *Phys. Rev. Lett.* 111, 087601, 2013
- 2) Engineering Polarization Rotation in Ferroelectric Bismuth Titanate **Amritendu Roy**, Rajendra Prasad, Sushil Auluck and Ashish Garg, *Appl. Phys. Lett.*, 102, 182901, 2013.
- 3) Structure and Properties of Magnetoelectric Gallium Ferrite: A Brief Review **Amritendu Roy**, Somdutta Mukherjee, Rajeev Gupta, Rajendra Prasad, and Ashish Garg (In press, *Ferroelectrics*, 2013)
- 4) Effect of Site-disorder, Off-stoichiometry and Epitaxial Strain on the Optical Properties of Magnetoelectric Gallium Ferrite **Amritendu Roy**, Somdutta Mukherjee, Surajit Sarkar, Sushil Auluck, Rajendra Prasad, Rajeev Gupta and Ashish Garg, *J. Phys. Condens. Matter*, 24, 435501, 2012
- 5) Effect of site disorder on Magnetism and Magneto-structural Coupling in Gallium Ferrite: A First-Principles Study **Amritendu Roy**, Rajendra Prasad, Sushil Auluck and Ashish Garg, *J. Appl. Phys.* 111, 043915, 2012.

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† Total citations: 67, *h* index: 4

- 6) Multiferroic Memories, **Amritendu Roy**, Rajeev Gupta and Ashish Garg, *Adv. Condens. Matter Phys.*, 2012, 926290, 2012
- 7) Electronic Structures, Born Effective Charges and Spontaneous Polarization in Multiferroic Gallium Ferrite **Amritendu Roy**, Somdutta Mukherjee, Rajeev Gupta, Sushil Auluck, Rajendra Prasad and Ashish Garg, *J. Phys.: Condens. Matter* 23, 325902, 2011
- 8) First-Principles Calculations of Born Effective Charges and Spontaneous Polarization of Ferroelectric Bismuth Titanate **Amritendu Roy**, Rajendra Prasad, Sushil Auluck and Ashish Garg, *J. Phys.: Condens. Matter* 22, 165902, 2010.
- 9) Feasibility and Kinetics of Nitriding of Pure Titanium and Ti-6Al-4V in the Molten Salt Bath of Potassium Nitrate **Amritendu Roy**, K. Shivakumar, A. Raghunath, R.C. Sharma, R. Shekhar, *Surface Engineering*, 28 (6), 458, 2012.
- 10) Quench Hardening of 0.4%C Steel by Using Aqueous Electrolyte Plasma as Heat Source, **A. Roy**, S.J. Parihar, R.C. Sharma, R. Shekhar, *Surface Engineering*, 25 (6), 423, 2009
- 11) Aqueous Electrolyte Plasma Nitriding: A Feasibility Study, **A. Roy**, R. K. Tewari, R.C. Sharma, R. Shekhar, *Surface Engineering*, 23 (4), 243, 2007.

### Articles under Review

- 12) Optical Anisotropy in Bismuth Titanate: An Experimental and Theoretical Study **Amritendu Roy**, Rajendra Prasad, Sushil Auluck and Ashish Garg
- 13) A Theoretical Study to Explore into the Reasons for Anomalously Large Born Effective Charges in Perovskite Oxides **Amritendu Roy**, Rajendra Prasad, Sushil Auluck and Ashish Garg

### Conference Proceedings

1. A First-Principles Study of Structure-Property Correlation and the Origin of Ferrimagnetism in Gallium Ferrite **Amritendu Roy**, Ashish Garg, Rajendra Prasad, Sushil Auluck, CET 2012, Oct. 26-28, 2012, Beijing, China
2. Multiferroic SrTiO<sub>3</sub>/ BiFeO<sub>3</sub> Super-lattice: A First-principles Study, **Amritendu Roy**, Ashish Garg, Rajendra Prasad, Sushil Auluck, Nanotech Conference and Expo 2011 June 13-16, Boston, MA, USA

### Abstracts in Conferences

1. Effect of Cation Disorder on Electronic Structures and Optical Properties of Magnetoelectric Gallium Ferrite: A First-principles Study A Roy, S Auluck, R Prasad, A Garg, *Bulletin of the American Physical Society* 57, 2012
2. First Principles Studies of Electronic structure and Lattice Dynamics of Multiferroic GaFeO<sub>3</sub> A Roy, R Prasad, S Auluck, A Garg, *Bulletin of the American Physical Society* 56, 2011
3. Anisotropic Optical Behavior of Ferroelectric Bismuth Titanate: A Comparison of Experiment and Theory, A Roy, R Prasad, S Auluck, A Garg, *Bulletin of the American Physical Society* 55, 2010
4. A novel, in-situ electro heat treatment technique: Process feasibility studies, Parihar, S., **Roy, A.**, Sharma, R.C., Shekhar, R *Advanced Materials and Processes*, v 163, n 8, August, 2005, p 48.

### Seminars in Conferences/ Invited Talks

1. On-chip Tunable Magnetoelectric Components, IMAPS/ACerS 9th International Conference and Exhibition on Ceramic Interconnect and Ceramic Microsystems Technologies (CICMT 2013), April 23-25, 2013, Orlando, FL, USA.
2. First-principles Calculations of Structure-Property Correlations in Functional Oxides, Indian Institute of Technology, Jodhpur, India, Dec. 05, 2012.
3. Effect of Cation Disorder on Electronic Structures and Optical Properties of Magnetoelectric Gallium Ferrite: A First-principles Study APS March Meeting, Feb. 27-March 02, 2012, Boston, MA, USA
4. Structural, Electrical and Magnetic Properties of Multiferroic SrTiO<sub>3</sub>/BiFeO<sub>3</sub> Superlattice, ICMAT 2011, SUNTEC, Singapore, June 26-July 01, 2011

5. First Principles Calculations of Structural, Electrical and Magnetic Properties of Multiferroic SrTiO<sub>3</sub>/BiFeO<sub>3</sub> Multilayer Structure, International conference on quantum effects in solids, NPL, Delhi, India, Dec. 20-23, 2010
6. First-principles Calculations of Spontaneous Polarization in Ferroelectric Bismuth Titanate, H.P. University, Shimla, India, March 2010.