

List of Publications

1. Coupling of Small Lattice Polarons to Magnetic Field in Magnetoresistive Manganites
C. Meneghini, C. Castellano, Ashwani Kumar, **Sugata Ray**, D. D. Sarma and S. Mobilio; Phys. Stat. Solidi B **215**, 647 (1999).
2. Magnetoresistance in ordered and disordered double perovskite oxide, $\text{Sr}_2\text{FeMoO}_6$
D. D. Sarma, E. V. Sampathkumaran, **Sugata Ray**, R. Nagarajan, Subham Majumdar, Ashwani Kumar, G. Nalini, T. N. Guru Row; Solid State Communication **114**, 465 (2000).
3. Electronic structure of $\text{Sr}_2\text{FeMoO}_6$
D. D. Sarma, Priya Mahadevan, T. Saha-Dasgupta, **Sugata Ray**, and Ashwani Kumar; Phys. Rev. Lett. **85**, 2549 (2000).
4. Transport and magnetic properties of $\text{Sr}_2\text{FeMo}_x\text{W}_{1-x}\text{O}_6$
Sugata Ray, Ashwani Kumar, Subham Majumdar, E. V. Sampathkumaran and D. D. Sarma; J. Phys.: Condens. Matter **13**, 607 (2001).
5. Electronic and Magnetic Structures of $\text{Sr}_2\text{FeMoO}_6$
Sugata Ray, Ashwani Kumar, D. D. sarma, R. Cimino, S. Turchini, S. Zennaro, N. Zema; Phys. Rev. Lett. **87**, 097204 (2001).
6. Properties of a new magnetic material: $\text{Sr}_2\text{FeMoO}_6$
D. D. Sarma and **Sugata Ray**, Proc. of Indian Acad. Sci. (Chem. Sci.) **113**, 515 (2001).
7. Difference in spin state and covalence between $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ and $\text{La}_{2-x}\text{Sr}_x\text{Li}_{0.5}\text{Co}_{0.5}\text{O}_4$
Z. Hu, C. Grazioli, M. Knupfer, M. S. Golden, J. Fink, Priya Mahadevan, Ashwani Kumar, **Sugata Ray**, D. D. Sarma, S. A. Warda, D. Reinen, S. Kawasaki, M. Takano, C. Schüssler-Langeheine, Chandan Majumdar and G. Kaindl; J. of Alloys and Comp. **343**, 5 (2002).
8. Local Structure of hole-doped manganites: influence of temperature and applied magnetic field
C. Meneghini, C. Castellano, S. Mobilio, Ashwani Kumar, **Sugata Ray** and D. D. Sarma; Journal of Physics: Condensed matter **14**, 1967 (2002).
9. Strong correlation effects in the electronic structure of $\text{Sr}_2\text{FeMoO}_6$
Sugata Ray, Priya Mahadevan, Ashwani Kumar, D. D. Sarma, R. Cimino, M. Pedio, L. Ferrari and A. Pesci; Phys. Rev. B **67**, 085109 (2003).

10. Electron spectroscopic investigation of metal-insulator transition in $\text{Ce}_{1-x}\text{Sr}_x\text{TiO}_3$
Manju. U, S. R. Krishnakumar, **Sugata Ray**, S. Raj, M. Onoda, C. Carbone and D. D. Sarma; Proc. of Indian Acad. Sci.(Chem. Sci.) **115**, 491 (2003).
11. Local structure of $\text{Sr}_2\text{FeMo}_x\text{W}_{1-x}\text{O}_6$ double perovskites studied by EXAFS
F. Bardelli, C. Meneghini, S. Mobilio, **Sugata Ray** and D. D. Sarma; Phys. Scr. **T115**, 457 (2005).
12. Angle-resolved photoemission spectroscopy of the metallic sodium tungsten bronzes Na_xWO_3
S. Raj, D. Hashimoto, H. Matsui, S. Souma, T. Sato, T. Takahashi, **Sugata Ray**, A. Chakraborty, D. D. Sarma, Priya Mahadevan, W. H. McCarroll, and M. Greenblatt; Phys. Rev. B **72**, 125125 (2005).
13. $\text{Sr}_2\text{FeMoO}_6$: A Prototype to Understand a New Class of Magnetic Materials
Sugata Ray and D. D. Sarma; Hyperfine Interactions, **160**, 67 (2005).
14. An Interesting Magnetoresistive System: $\text{Sr}_2\text{FeMoO}_6$
Sugata Ray and D. D. Sarma; Solid State Physics (India) - Proceedings of the DAE Symposium (2003) **46**, 929 (2005), Cond-mat/0411400, 16th Nov. (2004).
15. XAFS study on $\text{Sr}_2\text{FeMo}_x\text{W}_{1-x}\text{O}_6$ double perovskite series
F. Bardelli, C. Meneghini, S. Mobilio, **Sugata Ray**, and D. D. Sarma; Materials Science and Engineering B **126**, 226 (2006).
16. Understanding the bulk electronic structure of $\text{Ca}_{1-x}\text{Sr}_x\text{VO}_3$
Kalobaran Maiti, U. Manju, **Sugata Ray**, Priya Mahadevan, I.H. Inoue, C. Carbone, and D. D. Sarma; Phys. Rev. B **73**, 052508 (2006).
17. Local structure and magnetotransport in $\text{Sr}_2\text{FeMoO}_6$ oxides
F. Liscio, F. Bardelli, C. Meneghini, S. Mobilio, **Sugata Ray**, and D. D. Sarma; Nucl. Instru. Methods Phys. Res. B **246**, 189 (2006).
18. A microspectroscopic study of the electronic homogeneity of ordered and disordered $\text{Sr}_2\text{FeMoO}_6$
Dinesh Topwal, Manju U., **Sugata Ray**, S. Raj, D. D. Sarma, S.R. Krishnakumar, M. Bertolo, S. La Rosa and G. Cautero; J. Chem. Sci. **118**, 87 (2006).
19. Electron spectroscopic investigation of metal-insulator transition in $\text{Sr}_2\text{Ru}_{1-x}\text{Ti}_x\text{O}_4$
Sugata Ray, D. D. Sarma, and R. Vijayaraghavan; Phys. Rev. B **73**, 165105 (2006).

20. Direct observation of ferroelectricity in quasi zero dimensional Barium Titanate nanoparticles
Sugata Ray, Yury V. Kolen'ko, Desheng Fu, Ruwan Gallage, Naonori Sakamoto, Tomoaki Watanabe, Masahiro Yoshimura, and Mitsuru Itoh; *Small* **2**, 1427 (2006).
21. A Facile High-Yield Solvothermal Route to Tin Phosphide Sn_4P_3
 Kirill A. Kovnir, Yury V. Kolen'ko, **Sugata Ray**, Jinwang Li, Tomoaki Watanabe, Mitsuru Itoh, Masahiro Yoshimura, and Andrei V. Shevelkov; *J. Solid State Chem.* **179**, 3751 (2006).
22. Metal-insulator transition in sodium tungsten bronzes, Na_xWO_3 , studied by angle-resolved photoemission spectroscopy
 S. Raj, D. Hashimoto, H. Matsui, S. Souma, T. Sato, T. Takahashia, **S. Ray**, A. Chakraborty, D. D. Sarma, P. Mahadevan, S. Oishi, W. H. McCarroll, M. Greenblatt; *J. Magn. Magn. Mater.* **310**, e231 (2007).
23. Intergranular Magnetoresistance in $\text{Sr}_2\text{FeMoO}_6$ from a Magnetic Tunnel Barrier Mechanism across Grain Boundaries
 D. D. Sarma, **Sugata Ray**, K. Tanaka, M. Kobayashi, A. Fujimori, P.Sanyal, H.R. Krishnamurthy and C. Dasgupta; *Phys. Rev. Lett.* **98**, 157205 (2007).
24. Critical Test for Altshuler-Aronov Theory: Evolution of the Density of States Singularity in Double Perovskite $\text{Sr}_2\text{FeMoO}_6$ with Controlled Disorder
 M. Kobayashi, K. Tanaka, A. Fujimori, **Sugata Ray**, and D. D. Sarma; *Phys. Rev. Lett.* **98**, 246401 (2007).
25. Pressure and temperature dependence of the Fano resonance in the Raman spectrum of $A_2\text{FeMoO}_6$ systems ($A = \text{Sr}, \text{Ca}$)
 D. Marrocchelli, P. Postorino, D. Di Castro, E. Arcangeletti, P. Dore, M. Cestelli Guidi, **Sugata Ray**, and D. D. Sarma; *Phys. Rev. B* **76**, 172405 (2007).
26. High temperature ferromagnetism in single crystalline dilute Fe-doped BaTiO_3
Sugata Ray, Priya Mahadevan, Suman Mandal, S. R. Krishnakumar, Carlos Seiti Kuroda, T. Sasaki, Tomoyasu Taniyama, and Mitsuru Itoh; *Phys. Rev. B* **77**, 104416 (2008).
27. Pressure effects on the magnetic transition temperature in ordered double perovskites
 D. Di Castro, P. Dore, R. Khasanov, H. Keller, P. Mahadevan, **Sugata Ray**, D. D. Sarma, and P. Postorino; *Phys. Rev. B* **78**, 184416 (2008).

28. Local structure of $\text{Sr}_2\text{FeMo}_x\text{W}_{1-x}\text{O}_6$ double perovskites across the composition driven metal to insulator transition
F Bardelli, C Meneghini, S Mobilio, **Sugata Ray** and D. D. Sarma; J. Phys.: Condens. Matter, **21**, 195502 (2009).
29. Nature of “disorder” in the ordered double perovskite $\text{Sr}_2\text{FeMoO}_6$
C. Meneghini, **Sugata Ray**, F. Liscio, F. Bardelli, S. Mobilio, and D. D. Sarma; Phys. Rev. Lett. **103**, 046403 (2009).
30. Unusual tunneling magnetoresistance in Sr_2CrWO_6
Somnath Jana, Srimanta Middey, and **Sugata Ray**; Solid State Physics (India) - Proceedings of the DAE Symposium (2008) **54**, 1031 (2009).
31. Phase inhomogeneity in multiferroic $\text{Eu}_{1-x}\text{Y}_x\text{MnO}_3$
Srimanta Middey, Somnath Jana, A. M. Balbashov, V. Yu. Ivanov, A. A. Mukhin, D. D. Sarma, and **Sugata Ray**; Solid State Physics (India) - Proceedings of the DAE Symposium (2008) **54**, 1067 (2009).
32. Spin-valve-type magnetoresistance: a generic feature of ferromagnetic double perovskites
Somnath Jana, Srimanta Middey, and **Sugata Ray**; J. Phys.: Condens. Matter **22**, 346004 (2010).
33. Surface spin-glass and exchange bias in $\text{Sr}_2\text{FeMoO}_6$ nanoparticle
Srimanta Middey, Somnath Jana, and **Sugata Ray**; J. Appl. Phys. **108**, 043918 (2010).
34. Atomic scale chemical fluctuation in LaSrVMoO_6 : A proposed halfmetallic antiferromagnet
Somnath Jana, Vijay Singh, S. D. Kaushik, Carlo Meneghini, Prabir Pal, Ronny Knut, Olof Karis, Indra Dasgupta, Vasudeva Siruguri, and **Sugata Ray**; Phys. Rev. B: Rapid Comm. **82**, 180407(R) (2010).
35. Defect induced magnetism: an affirming test of dilute magnetism in Fe-doped hexagonal BaTiO_3 single crystals
Tanushree Chakraborty, **Sugata Ray**, and Mitsuru Itoh; Phys. Rev. B **83**, 144407 (2011).
36. Glass-like ordering and spatial inhomogeneity of magnetic structure in $\text{Ba}_3\text{FeRu}_2\text{O}_9$: The role of Fe/Ru-site disorder

- Srimanta Middey, **Sugata Ray**, K. Mukherjee, P. L. Paulose, E. V. Sampathkumaran, C. Meneghini, S. D. Kaushik, V. Siruguri, Kirill A. Kovnir, and D. D. Sarma; Phys. Rev. B **83**, 144419 (2011).
37. Origin of the unconventional magnetoresistance in $\text{Sr}_2\text{FeMoO}_6$
Sugata Ray, Srimanta Middey, Somnath Jana, A. Banerjee, P. Sanyal, Rajeev Rawat, Luca Gregoratti, and D. D. Sarma; Europhysics Letters **94**, 47007 (2011).
38. Defect controlled room temperature ferromagnetism in Co-doped barium titanate nanocrystals
Sugata Ray, Yury V Kolen'ko, Kirill A Kovnir, Oleg I Lebedev, Stuart Turner, Tanushree Chakraborty, Rolf Erni, Tomoaki Watanabe, Gustaaf Van Tendeloo, Masahiro Yoshimura and Mitsuru Itoh; Nanotechnology **23**, 025702 (2012).
39. LaSrVMoO_6 : A case study for A-site covalency-driven local cationic order in double perovskites
Somnath Jana, Vijay Singh, Abhishek Nag, Carlo Meneghini, Indra Dasgupta, Giuliana Aquilanti, and **Sugata Ray**; Phys. Rev. B **86**, 014203 (2012).
40. Evidence of oxygen-vacancy-induced ferromagnetic order in single crystal Mn-doped SrTiO_3
Srimanta Middey, Carlo Meneghini, and **Sugata Ray**; Appl. Phys. Lett. **101**, 042406 (2012).
41. Signature of an antiferromagnetic metallic ground state in heavily electron doped $\text{Sr}_2\text{FeMoO}_6$
Somnath Jana, Carlo Meneghini, Prabuddha Sanyal, Soumyajit Sarkar, Tanusri Saha-Dasgupta, Olof Karis, and **Sugata Ray**; Phys. Rev. B **86**, 054433 (2012).
42. Giant texturing effect in multiferroic MnWO_4 polycrystals
Somnath Jana, Abhishek Nag, and **Sugata Ray**; J. Phys D.: Appl. Phys **45**, 425301 (2012).
43. Magnetoresistance and electroresistance effects in Fe_3O_4 nanoparticle system
P. Anil Kumar, **Sugata Ray**, S. Chakraverty and D. D. Sarma; Journal of Experimental Nanoscience (*in press*).
44. Microscopic distribution of metal dopants and anion vacancies in Fe-doped $\text{BaTiO}_{3-\delta}$ single crystals
Tanushree Chakraborty, Carlo Meneghini, Giuliana Aquilanti and **Sugata Ray**; J. Phys.: Condens. Matter **25**, 236002 (2013).

45. Magnetic and nonmagnetic tunnel barriers in $\text{Sr}_2\text{FeMoO}_6$
Abhishek Nag, Somnath Jana, Srimanta Middey and Sugata Ray; IOP Conf. Series: Materials Science and Engineering **46**, 012001 (2013).
46. Photoelectron spectromicroscopy study of metalinsulator transition in Na_xWO_3
Sanhita Paul, Anirudha Ghosh, Pavel Dudin, Alexei Barinov, Anirban Chakraborty, **Sugata Ray**, D. D. Sarma, Shuji Oishi, Satyabrata Raj; Solid State Communications **166**, 66 (2013).
47. Structural, electrical, and magnetic properties of $\text{Ba}_{0.9}\text{Ca}_{0.1}\text{Ti}_{0.97}\text{Fe}_{0.03}\text{O}_3$ and the effect of oxygen vacancies
Tanushree Chakraborty, Carlo Meneghini, Giuliana Aquilanti, and **Sugata Ray**; J. Appl. Phys. **114**, 223911 (2013).
48. Engineered spin-valve type magnetoresistance in Fe_3O_4 - CoFe_2O_4 coreshell nanoparticles
P. Anil Kumar, **Sugata Ray**, S. Chakraverty, and D. D. Sarma; Appl. Phys. Lett. **103**, 102406 (2013).
49. Re-entrant superspin glass phase in $\text{La}_{0.82}\text{Ca}_{0.18}\text{MnO}_3$ ferromagnetic insulator
P. Anil Kumar, R. Mathieu, P. Nordblad, **Sugata Ray**, Olof Karis, Gabriella Andersson, D. D. Sarma; Phys. Rev. X (*in press*).

Conference and presentations

- Oral presentation in Elettra, Synchrotron Centre, Italy; February 2004.
- Oral presentation in Third Asian Conference on Crystal Growth and Crystal Technology (CGCT-3) in Beijing, China; October 2005.
- Oral presentation in Pacificchem 2005 in Hawaii, USA; December 2005.
- Oral presentation in one day symposium in S. N. Bose National Center for Basic Sciences, April, 2007.
- Invited Lecture in Third Indo-Japan conference, Indian Association for the Cultivation of Science, February, 2008.
- Invited Lecture in TIFR-ANSTO Collaboration Initiative Meeting, TIFR, Mumbai, August, 2008.
- Participated and presented in the Indo-German meeting on “Nano-sized high energy photon beams at PETRA-III Facility” in Bangalore in January, 2009.
- Presented an invited lecture in “International Conference on Physics between India & Singapore 2009”, held in SNBCBS during 6-8 Feb. 2009.
- Presented an invited lecture in the conference named “Recent Trends in Strongly Correlated System” held in IACS between 2-4 March, 2009.
- Invited lecture in 2nd Indo-Sweden workshop by Swedish Foundation for International Collaboration in Research and Higher Education (STINT), Uppsala University, September 20-25, 2009.
- Invited lecture in “MAGNETISM, SUPERCONDUCTIVITY AND PHASE TRANSITIONS IN NOVEL AND COMPLEX MATERIALS: MSM09 MEETING”, SNBCBS, November 11-14, 2009.
- Invited Lecture in “Indo-Swedish meeting on complex oxide systems” IISc, Bangalore, February 25-27, 2010.
- Invited Lecture in “International Conference on Physics of Novel Oxide Materials” arranged by APCTP-IACS, Pohang, Korea, July 15-17, 2010.
- Invited Lecture in “International Conference on Magnetic Materials” arranged in SINP, Kolkata, India during October 25-29, 2010.
- Invited Lecture in “ICTS Condensed Matter Programme 2010” arranged in Mysore, India during December 18-20, 2010.

- Invited Lecture in “Joint STINT Workshop on multifunctional oxides and minerals” arranged in Uppsala, Sweden during March 1-3, 2011.
- Invited Lecture in “International Conference on Functional Materials” arranged in HRI, Allahabad” during April 2-3, 2011.
- Invited Lecture in Rome Tre University, Rome, Italy, June 17, 2011.
- Invited Lecture in 3rd IACS-APCTP meeting, IACS, India, November, 2011.
- Invited Lecture in “Magnetism: Practice and Theory”, Coorg, India, November, 2011.
- Invited Lecture in “Advanced and Functional Materials”, SNBNCBS, March, 2012.
- Invited Lecture in New Alipore College, Kolkata, March 2012.
- Invited Lecture in ATHENA 2012, SNBNCBS, April, 2012.
- Invited Lecture under DST INSPIRE program, Patna University, 31st August, 2012.
- Invited Lecture in Workshop at CGCRI, Kolkata, 25th September, 2012.
- Invited Lecture at University of Tokyo, India, 22nd November, 2012.
- Invited Lecture in R. K. M. V. C. College, Rahara, 9th January, 2013.
- Invited Lecture in “Calcutta Moscow Symposium”, SNBNCBS, January, 2013.
- Invited Lecture under DST INSPIRE program, Patna University, April, 2013.
- Invited Lecture in MTM14, ICTS, IISc, January, 2014.

Conference organized

- Two day in-house symposium in IACS, May, 2007
- Third Indo-Japan conference, Indian Association for the Cultivation of Science, February, 2008.
- Recent Trends in Strongly Correlated System held in IACS, March, 2009.
- MAGNETISM, SUPERCONDUCTIVITY AND PHASE TRANSITIONS IN NOVEL AND COMPLEX MATERIALS: MSM09 MEETING, SNBNCBS, November, 2009.
- I3rd IACS-APCTP meeting, IACS, November, 2011.

Achievements and Awards

- Dr. A. Nagaraja Rao medal for the best thesis of Chemical Sciences Division, Indian Institute of Science, during the year 2003-2004.
- Fellowship of Japan Society for Promotion of Science (JSPS) in 2004.
- MRSI Young Scientist Award 2007.
- Short-Term Faculty fellowship of Japan Society for Promotion of Science (JSPS) in 2012.

Number of Ph. D. students

Three students have obtained their Ph.D. degree, one has submitted and five students are currently carrying out their Ph.D. work under my supervision.

January 27, 2014