Biodata

1. **Name**: Dr. Satyabrata Patnaik

2. **Mailing address**: Professor, School of Physical Sciences

Jawaharlal Nehru University, New Delhi 110067 India

spatnaik@mail.jnu.ac.in, Phone +91 11 26704783

3. **Date of Birth**: 3rd May 1969

4. **Specialization**: Experimental Condensed Matter Physics, Material Science

5. **Educational Qualification**:

Degree	University	Year	Subjects
M. Sc.	IIT Delhi	1991	Physics
M. Tech	IIT Kanpur	1993	Nuclear Engg. & Tech.
Ph.D.	IIT Kanpur	2000	Physics

6. **Professional recognition, awards, fellowships received**:

- Fulbright – Nehru Senior Research Fellowship (2011)
- Commonwealth Fellowship, University of Cambridge UK (2009)
- SCOPUS Young Scientist Award (2008)
- DAE Young Achiever Award (2006)
- Merrill – Lynch innovation award (2001)
- National Scholarship (1989 – 1991)
- State Merit Scholarship (1980 -1989)
- Citations for published research work (Google Scholar): over **4500**

7. **Theses:**

Ph.D. Thesis: Effects of granularity and correlated pinning disorder on vortex dynamics in highly oriented platelets of Bismuth based cuprate superconductors (Supervisor: **Prof. R. C. Budhani**)

M.Tech. Thesis: Field coil specifications for ECRH assisted start up in a TOKAMAK (Supervisors: **Prof. K. Sriram** and **Prof. S. Chaturvedi**(IPR))

M.Sc. Thesis: Characterization studies of iron doped calcium borate glasses (Supervisor Prof. **R. G. Mendiratta**)

8. **Details of professional training:**

- Associate Researcher, Applied Superconductivity Center, University of Wisconsin-Madison, USA (with Prof. David Larbalestier) 2000 -2002.
- Visiting Scientist, Laboratoire des Physique des solides, Université Paris Sud, Orsay, France (with Prof. Helene Raffy and Marcin Konczykowski) October 1998.
- Academic Staff Fellow, University of Cambridge, Cambridge, UK (with Prof. Judith Driscoll) 2009 – 2010.
- Senior Research Fellow, University of Wisconsin-Madison (With Prof. C. B. Eom) 2011 – 2012
- Visiting Research Professor, Institute of Physics, Chinese Academy of Sciences, Beijing (With Prof. Xingjiang Zhou) June-July 2015.

9. **Details of employment:**

Assistant Professor, School of Physical Sciences, JNU, New Delhi July 2002-August 2008

Associate Professor, School of Physical Sciences, JNU New Delhi Aug 2008-

10. Courses taught:

Electromagnetic Theory, Solid State Physics, Special Topics in Condensed Matter Physics, Experimental Physics Lab –I and III, and Atoms and Molecules.

11. Ph.D. Thesis supervised:

1) **Dr. Somdatta Kaushik** (Scientist, UGC-CSR Mumbai)

Thesis Title : Effects of pinning disorder on multiband transport properties of superconducting Magnesium Diboride

2) **Dr. Anil. K. Singh** (Assistant Professor, NIT Rourkela)

Thesis Title: Study of magneto-electric coupling in novel spin frustrated multiferroics

3) **Dr. D. Srikala** (Assistant Professor, Delhi University)

Thesis title: Synthesis and characterization of magnetic system in Nano-Scale

4) **Dr. Shivjee Singh** (RA, Oxford University, UK)

Thesis Title: Study of transport and magnetization properties of ferropnictide superconductors.

5) **Dr. Gyaneswar Sharma** (Assistant Professor, Govt. College, Etawa, UP)

Thesis title: Studies on magnetic structure driven ferroelectricity in transition metal oxides

6) **Dr. Jitendra Saha** (RA, Upasala University, Sweden)

Thesis title: Study of multiferroicity in oxide heterostructures

7) **Dr. Shruti** (Assistant Professor, Govt College, Jhansi, UP)

Thesis title: Exploring novel superconductivity in oxy – ferropnictides

8) **Dr. Vishal Maurya** (NPDF, IIT Delhi)

Thesis title: Synthesis and characterization of superconductors derived from topological insulators.

9) **Dr. Rohtash Kumar** (RA, JNU)

Thesis Title: Nanostructure-Dielectric properties relationship in Lead-free relaxor ferroelectrics using Transmission Electron Microscopy

10) **Dr. Prakriti Neha** (University of Bologna, Italy)

Thesis title: Superconductivity in Pnictides, Selenides and Gallides; New Insights

Current Ph.D. students: Mr. Pawan Kumar, Ms. Shivani Choudhary, Mr. Ganesh Gurjar, Mr. Vipin Nagpal, Mr. Karn Singh Jat, Mr. Amar Dagar

12. Significant contribution over the last 10 years

We have made wide ranging contributions to the fields of multiferroics, superconductivity and nano-magnetism over the last years.

A. Multiferroics :

The sub-area in the broad field of multiferroics where we have extensively contributed in the recent past, deals with multiferroic materials where the electric polarization is caused by exotic magnetic correlations rather than non-centro-symmetric crystal structure. In particular, we have studied such effects in frustrated magnetic systems with non-collinear (Dzyaloshinskii-Moria type interaction) and collinear (magnetostriction driven) magnetic orderings.

1. We have established substantial magneto-electric coupling in $Bi_2Fe_4O_9$ near room temperature (**Appl. Phys. Lett.** 92, 132910 (2008)). This work on $Bi_2Fe_4O_9$ was highlighted in **Nature-Asia** (http://www.natureasia.com/asia-materials/highlight.php?id=244).
2. Our recent work on magnetic field dependent neutron scattering experiments in hexagonal $YMnO_3$ delineates the dominance of magneto-elastic coupling over and above magneto-electric coupling in this frustrated magnet (**Phys. Rev. B** 81, 184806 (2010)).
3. We have identified a new magnetic field driven ferroelectric phase in spin frustrated $Ni_3V_2O_8$ (**Europhys. Lett**. 86, 57001 (2009)).
4. The central challenge with magnetic structure driven ferroelectricity is that such emergent behaviour remains a low - temperature phenomena (typically below ~40 K). We have recently provided strong evidence for robust multiferroic effects in a collinear magnetic-chain double perovskite Y_2CoMnO_6 at a temperature range above the industrial benchmark of liquid nitrogen temperature (**Appl. Phys. Lett.** 103**,** 012903 (2013)).
5. Our study on lattice mismatched $YMnO_3$ thin films established that its anti-ferromagnetic correlation is tuneable through strain (**J. Appl. Phys.** 106, 014109 (2009)).
6. Recently we have initiated a strong program on thermoelectric materials based on half -Huesler compounds. We have developed experimental facilities for in-house measurement of Seebeck Coefficient and Thermal conductivity.

B. Superconductivity

Over the last five years our group has worked extensively on superconducting materials in three generic systems, e.g. Diborides, Oxypnictides, and Bismuth-sulphides. In strong collaboration with Prof. A. K. Ganguli's Chemistry Lab at IIT Delhi, we have published over 15 papers on Oxypnictides. Our important works in this field are as follows;

1. Demonstration of enhancement in transition temperature, critical current density and critical fields by simultaneous substitution of Y in place of Ce and F in place of O in the semimetal CeOFeAs. Such multiple benefits are achieved by optimization of three independent parameters; higher chemical pressure, selective tuning of multi-band scattering mechanism and superior vortex pinning properties of Y_2O_3 (**Appl. Phys. Lett**. 95, 262507 (2009)).
2. We were the first group to achieve induction of superconductivity due to Co doping in place of Fe in FeAs layers of CeOFeAs (**Solid State Communications** 149, 181 (2009). This is exciting because in cuprates any amount of tinkering in the CuO layers would always destroy superconductivity!
3. Two fold increase in upper critical field in lanthanum based oxypnictides is achieved by tuning inter and intra band scattering through simultaneous doping of K in place of La and F in place of O (**Europhys. Lett**. 84, 57003 (2008).
4. Determination of basic superconducting parameters in layered oxysulphide $Bi_4O_4S_3$ (**J. Am. Chem. Soc.** 134 16504 (2012)).
5. Our current research focuses on the identification of topological superconductivity in Sr-intercalated Bi_2Se_3 (Phys. Rev. B **Phys. Rev. B., 92,** 020506R (2015)and **arxiv/**1804.08998**)**

C. Magnetism in Nano-scale

It is well known that robust ferromagnetism at room temperature in cobalt and iron disappears in the nano - scale. Using oxygen passivation techniques, our group has synthesized and studied exchange bias effects in cobalt nano-spheres and nano-cubes. Their main contribution in this area would be the achievement of about an order of magnitude enhancement in the blocking temperature by exchange biasing ferromagnetic nano-spherical core (Co) with an antiferromagnetic shell (CoO). This result has strong implication towards eventual application of these nano-magnets at room temperature (**J.**

Phys. Chem C 112 36, 13882 (2008), **JNN** 9, 5627 (2009), **JMMM** 324, 2512 (2012)). We have also attempted to study diluted magnetic semiconductors in nano-scale by incorporating cobalt onto PbSe nano-particles. Using wire explosion technique they have synthesized Niobium nano-particles of dimension smaller than bulk coherence length and studied the variation in superconducting (diamagnetic) transition temperature using magnetic penetration depth measurements.

D. Magneto-resistance in Weyl and Dirac semimetals

The phenomena of magneto-resistance finds wide application in industry particularly in the areas of magnetic storage devices and data read-heads. In the recent past exceptional magneto-resistance has been observed in Weyl and Dirac semimetals such as NbP, WTe_2, TaAs and Cd_3As_2. We have reported on the origin of such high magnetoresistnce in NbP (Scientific Report **Scientific Reports**, 7, 46062 (2017)) and $TaSb_2$ (**arxiv/**1807.08434).

13. Externally funded projects:

Title	Sponsor	Amount	From Date (Month-Year)	To Date (Month-Year)
Electronic anisotropy of MgB_2	DST	11.3 Lacs	2005	2008
Study of magntoelctric coupling and its correlation with crystal structure in doped and pure $YMnO_3$	UGC-CSR	1.05 Lacs	2008	2010
Study of penetration depth and electronic anisotropy in Oxypnictide superconductors	UGC	11.98 Lacs	2009	2014.
Magneto-transport studies in weyl semimetal and doped topological	DST DERB File no: EMR/2016/003998/PHY	48,14,377.00	28 March 2017	2019

insulator				
Growth and characterization of thin film devices relevant for genomics and superconductivity applications	UPE II (UGC) Project ID: 129	11,00,000.00	01 April, 2014	2019
Upgradation of metallurgical characterization facilities in CIF-SPS	UPE II (UGC) Project ID: 137	11,00,000.00	01 April 2014	2019
Optimization of Heusler based Nano-composite Materials for Thermoelectric Energy Conversion	INDO-RUSSIAN DST-RFBR		January 2019	2021

14. Infrastructure development

With generous support from UGC and DST we have been able to nucleate a strong material science program at JNU. We have access to polycrystalline, thin film, and single crystal sample growth and varied transport and magnetization characterization over broad range of temperature (300 mK to 700K), Magnetic field (upto 14 Tesla) and pressure (upto 30 kbar). In conjunction with AIRF JNU, we routinely undertake Magneto-resistance, Hall, Specific heat, Thermoelectric power, DC/AC susceptibility, RF penetration depth, Dielectric constant and Electric polarization measurements. We also have in-house access to XRD, HRTEM, SEM/EDAX, and Raman spectroscopy.

15. Publications

Journals

1. *Radio frequency vortex dynamics in oriented platelets of $(Bi\text{-}Pb)_2Sr_2Ca_2Cu_3O_{10}$ superconductor,* S. Patnaik, R. C. Budhani, Y.-L. Yang, and M. Suenaga, **Physica C** 309, 221 (1998).
2. *Apparatus for vortex dynamics studies in high T_c samples using close cycle refrigerator and RF oscillators*, S. Patnaik, K. J. Singh, and R. C. Budhani, **Review of Scientific Instruments** 70, 1494, (1999).
3. *Anisotropy dominated radio frequency vortex dynamics in $Bi_2Sr_2CaCu_2O_8$ thick films on silver tapes,* S. Patnaik, R. C. Budhani, and D. W. Hazelton, **Physica C** 325, 210 (1999).
4. *Effects of granularity and strong pinning on high frequency vortex dynamics in $(Bi\text{-}Pb)_2Sr_2Ca_2Cu_3O_{10}$ superconducting platelets,* S. Patnaik, R. C. Budhani, and M. Konczykowski, **Solid State Communications** 113, 109 (2000).
5. *Vortex phases and c-axis correlation in as grown and heavy ion irradiated $(Bi\text{-}Pb)_2Sr_2Ca_2Cu_3O_{10}$ superconducting tapes; A Flux transformer study,* S. Patnaik, R. C. Budhani, M. Konczykowski, Y. -L. Yang, and M. Suenaga, **Superconductor Science and Technology** 13, 1 (2000).
6. *Radio frequency vortex dynamics in heavy ion irradiated $(Bi\text{-}Pb)_2Sr_2Ca_2Cu_3O_{10}$ superconducting platelets,* S. Patnaik, R. C. Budhani, M. Konczykowski, Y. -L. Yang, and M. Suenaga, **Physica C** 349, 155 (2001).
7. *Local Hall-probe-based susceptometry of $Tl_2Ba_2CaCu_2O_8$ epitaxial films: Critical state and flux dynamics in collinear ac and dc mangetic fields*, L. K. Sahoo, S. Patnaik, R. C. Budhani, and W. L. Holstein, **Physical Review B** 63, 214501 (2001).
8. *Examination of current limiting mechanism in monocore Ag/BSCCO tapes with high critical current density*, A. Polyanski, M. Feldman, S. Patnaik, J. Jian, X. Cai, D. Larbalestier, K. DeMorvanville, D. Yu and R. Parrella, **IEEE transactions on Applied Superconductivity** 11, 3269 (2001).
9. *Strongly linked current flow in polycrystalline forms of MgB_2,* D. C . Larbalestier, M. Rikel, L. D. Cooley, A. A. Polyanski, J. Y. Jiang, S. Patnaik, X. Y. Cai, D. M. Feldman, A. Gurevich, A. A. Squitieri, M. T. Naus, C. B. Eom, E. E. Helstrom, R. J. Cava, K. A. Regan, N. Rogado, A. Hayward, T. He, J. S. Slusky, P. Khalifah, I. Inumaru, and M. Haas, **Nature** 410, 186 (2001).
10. *Thin film Magnesium Boride superconductor with very high critical current density and enhanced irreversibilty field*, C. B. Eom, M. K. Lee, J. H. Choi, L. Blenkey, X. Song, L. D. Cooley, M. T. Naus, S. Patnaik, J. Jiang, M. Rikel, A. Polyanskii, A. Gurevich, X. Y. Cai, S. D. Bu, S. E. Babcock, E. E. Hellstrom, D. C.

Larbalestier, N. Rogado, K. A. Regan, M. A. Hayward, T. He, J. S. Slusky, K. Inumaru, M. K. Haas,and R. J. Cava, **Nature** 558, 411 (2001).

11. *Electronic Anisotropy, Magnetic Field-Temperature phase diagram and their dependence on resistivity in c-Axis oriented MgB_2 thin films*, S. Patnaik, L. D. Cooley, A. Gurevich, A. A. Polyanskii, J. Y. Jiang, X. Y. Cai, A. A. Squitieri, M. T. Naus, M. K. Lee, J. H. Choi, L. Belenky, S. D. Bu, J. Letteri, X. Song, D. G. Schlom, S. E. Babcock, C. B. Eom, E. E. Hellstrom, and D. C. Larbalestier , **Superconductor Science and Technology** 14, 315 (2001).
12. *Flux Flow of Abrikosov-Josephson Vortices Along Grain Boundaries in High-Temperature Superconductors,* A. Gurevich, M. S. Rzchowski, G. Daniels, S. Patnaik, D. C. Larbalestier, B. M. Hinaus, F. Carillo, and F. Tafuri, **Physical Review Letters** 88(9), 097001/4 (2002).
13. *Anomalous reentrant inductive response at fractional filling density in heavy in irradiated Bi-2212 tapes*, S. Patnaik and R. C. Budhani, **Advances in Cryogenic Engineering**, 48(B), 986-993 (2002).
14. *Synthesis and Properties of c-axis Oriented Epitaxial MgB2 thin films,* S. D. Bu, D. M. Kim, J. H. Choi, J. Giencke, S. Patnaik, L. Cooley, E. E. Hellstrom, D. C. Larbalestier, And C. B. Eom, **Applied Physics Letters** 81, 1851 (2002).
15. *Interfacial structure of Epitaxial MgB_2 grown on (0001) sapphire,* W. Tian, X. Q. Pan, S. D> Bu, D. M. Kim, J. H. Choi, S. Patnaik and C. B. Eom, **Applied Physics Letters** 81, 685 (2002).
16. *Significant enhancement of irreversibility field in Clear limit bulk MgB_2* , V. Bracinni, L. D. Cooley, S. Patnaik, P. Martrineth, A. Palenzone, A. S. Siri, and D. C. Larbalestier, **Applied Physics Letters** 81, 4577 (2002).
17. *Local measurement of current density by Magneto-Optical current reconstructions in normally and over pressure processed BiSCCO Superconductors,* S. Patnaik, D. M. Feldmann, A. A. Polianskii, Y. Yuan, J. Jiang, X. Y. Cai, E. E. Hellstrom and D. C. Larbalestier, **IEEE Transactions on Applied Superconductivity** 13, 2930 (2003).
18. *Critical current limiting factors in post annealed BiSCCO tapes,* J. Jiang,X. Y. Cai, J. G. Chandler, S. Patnaik, Y. Yuan, A. A. Polianskii, E. E. Hellstrom and D. C. Larbalestier , **IEEE Transactions on Applied Superconductivity** 13, 3018 (2003).
19. *Microstructural and Jc improvements in over pressure processed Ag-Sheathed Bi-2223 tapes,* Y. Yuan, J. Jiang, X. Y. Cai, S. Patnaik, A. A. Polianskii, E. E. Hellstrom, D. C. Larbalestier, R. K. Williams and Y. Huang, **IEEE Transactions on Applied Superconductivity** 13, 2921 (2003).
20. *Very high upper critical fields in MgB_2 produced by selective tuning of impurity scattering,* A Gurevich, S Patnaik, V. Braccinni, K. H. Mielke, X Song, L. D. Coley, S. D. Bu, D. M. Kim, J. H. Choi, L. J. Belenky, J. Giencke, M. L. Lee, W. Tian,

X. P. Pan, A. Siri, E. E. Hellstrom, C. B. Eom, and D. C. Larbalestier, **Superconductor Science and Technology** 17, 278 (2004).

21. *Thermally activated current transport in MgB_2,* S. Patnaik, S. D. Kaushik, A. Gurevich, S. D. Bu, J. Choi, C. B. Eom, D. C. Larbalestier **Physical Review B** 70, 064503 (2004).

22. *Improved upper critical field in bulk-form magnesium diboride by mechanical alloying with carbon,* B. J. Senkowich, J. E. Glincke, S. Patnaik, C. B. Eom, E. E. Hellstrom, D. C. Larbalestier, **Applied Physics Letters,** 86, 202502 (2005).

23. *Modification of intergrain connectivity,upper critical field anisotropy and critical current density in ion irradiated MgB_2 films.* S. D. Kaushik, Ravi Kumar, P. K. Mishra, J. Giencke, C. B. Eom and S. Patnaik, **Physica C**, 442, 73 (2006).
24. *Intergrain connectivity and resistive broadening in the vortex state: a comparison between MgB_2, $NbSe_2$ and $Bi_2Sr_2Ca_2Cu_3O_{10}$,* S. D. Kaushik and S. Patnaik, **IEEE transactions in Applied Superconductivity** 17, 3016 (2007).
25. *Magnetoelectric properties of BixCo2-xMnO4 (0 ? x ? 0.3),* N Rajeevan , P Pradyumnan , D Shukla , Shalendra Kumar , Sunil Arora , Igor Shvets, A Singh , S. Patnaik, **Appl. Phys. Lett.** 92, 102910 (2008).
26. *Substantial magneto-electric coupling in $Bi_2Fe_4O_9$*, A. K. Singh, S. D. Kaushik, P. K. Mishra, V. Siriguri, B. Kumar and S. Patnaik, **Appl. Phys. Lett**. 92, 132910 (2008).
27. *Cryogen-free low temperature and high magnetic field apparatus, S. D. Kaushik, Anil K. Singh, D. Srikala, and S. Patnaik,* **Ind. Jour. Pure and Appl. Phys** 46, 334 (2008).
28. *Ferromagnetism and metal-semiconducting transition in Fe doped ZnO thin films* Abhinav Singh , Pardeep Thakur , K. Chae , W Choi , Basavaraj Angadi , S Kaushik , and S. Patnaik **J. Phys. D.** 41, 155002 (2008).
29. *Magnetic field dependence of vortex activation energy: A comparison between MgB_2, $NbSe_2$, and $Bi_2Sr_2Ca_2Cu_3O_{10}$*, S. D. Kaushik and S. Patnaik, **Pramana, Journal of Physics** 71, 1335 (2008).
30. *Control of exchange in cobalt nanoparticles by partial oxidation,* D. Srikala, V. Singh, A. Banerjee, B. R. Mehta and S. Patnaik **Jour. of Chem. Phys. C 112,** 36, 13882 (2008).
31. *Synthesis and characterization of cobalt nanospheres, nanocubes and nanodiscs*, D. Srikala, V. Singh, A. Banerjee, and S. Patnaik **Jour. of Nanosci. and Nanotech.** 9, 5627 (2009).

32. *Potassium fluoride doped LaOFeAs multi-band superconductor: Evidence of extremely high upper critical field,* S. J. Singh, J. Prakash, S. Patnaik and A. K. Ganguli, **Europhys. Lett.** 84, 57003 (2008).
33. *Superconductivity at 11.3 K induced by cobalt doping in CeOFeAs* S. J. Singh, J. Prakash, A. K. Ganguli, and S. Patnaik **Solid State Communication,** 149 189 (2009).
34. *Superconductivity at 42.7 K in $CeO_{1-x}F_xFeAs$ with upper critical field of 94 T* J. Prakash, S. J. Singh**,** S. Patnaik and A. K. Ganguli, **Physica C**, 82, 469 (2009).
35. *Enhancement in superconducting transition temperature and upper critical field of LaO0.8F0.2FeAs with antimony doping*, S. J. Singh, J. Prakash, S. Patnaik, and A. K. Ganguli **Superconductor Science and Technology**, 22, 045017 (2009).
36. *Compositionally controlled semimetal to superconducting transition in NaF-doped LaOFeAs: Enhancement in T_c due to Na-doping*, Prakash J, Singh S J, S. Patnaik and Ganguli A K, **Physica C** 469, 300 (2009).
37. *Upper critical field, superconducting energy gaps, and Seebeck coefficient in $La_{0.8}Th_{0.2}OFeAs$*, Prakash J, Singh S J, S. Patnaik and Ganguli A K, **J. Phys. Cond. Mat**., 21, 175705, (2009).
38. *Field dependent competing magnetic ordering in multiferroic $Ni_3V_2O_8$* A. K. Singh, D. Jain, V. Ganeshen, & S. Patnaik, **Europhys. Lett.** 86, 57001 (2009).
39. *Effect epitaxial strain on the magneto-electric coupling of $YMnO_3$ thin films* A. K. Singh, M. Snure, A. Tiwari, and S. Patnaik, **J. Appl. Phys.** 106, 014109 (2009).
40. *Enhancement in transition temperature temperature and upper critical field of $CeO_{0.8}F_{0.2}FeAs$ by yttrium doping*, J. Prakash, S. J. Singh, S. Patnaik and A. K. Ganguli, **Appl. Phys. Lett. 95**, 262507 (2009).
41. *Intragrain electric inhomogenitis and compositional variation of static dielectric constant in $LaMn_{1-x}Fe_xO3$* A. Karmakar, S. Majumdar, A. K. Singh and S. Giri, **J. Phys. D: Appl. Phys.** 42, 092004 (2009).
42. *Superconductivity at 31.3 K in Yb-doped La(O/F)FeAs superconductors* J. Prakash, S. J. Singh, S. Patnaik and A. K. Ganguli, **J. Chem. Sci. 122**, 43(2010).
43. *New oxypnictide superconductor $PrOFe_{1-x}Co_xAs$* J. Prakash, S. J. Singh, S. Patnaik and A. K. Ganguli, **J. Solid State Chem. 183**, 338 (2010).
44. *Role of chemical pressure in enhancing the transition temperature (T_c) and upper critical field (H_{c2}) in the Y-doped Ce-oxyfluoride superconductor* A. K. Ganguli, J. Prakash, S. J. Singh and S. Patnaik**, Eur. Phys. J. B. 73**, 177 (2010).

45. *Yttrium doped $La_{1-x}Y_xO_{0.9}F_{0.1}FeAs$ superconductors: Hall and Thermopower studies* S. J. Singh, J. Prakash, S. Patnaik and A. K. Ganguli, **Physica C** 470, 511 (2010).
46. *Anomalous Raman scattering from phonons and electrons of superconducting FeSe0.82*, P.Kumar, U.Kumar, J. Prakash, A. K. Ganguli, S.Saha, S. Patnaik, U.V. Waghmare, A. K. Sood, **Solid State Communication** 150, 557 (2010).
47. *Coexistence of strong ferromagnetism and polar switching at room temperature in Fe3O4–BiFeO3 nanocomposite thin films,* E. Weal, S. Patnaik, Z. Bi, H. Wang, T. Fix, A. Kursumovic and J. L. MacManus Driscoll, **Appl. Phys. Lett**. 97, 153121 (2010).
48. *Magnetoelectric coupling in Ca_3CoMnO_6,* S. D. Kaushik, S. Rayaprol, J. Saha, N. Mohapatra, V. Siruguri,1 P. D. Babu,S. Patnaik, and E. V. Sampathkumaran **J. Appl. Phys.** 108, 084106 (2010).
49. *Effects of simultaneous charge carrier doping in charge reservoir and conducting layers of superconducting $CeO_{0.9}F_{0.1}Fe_{1-x}Co_xAs$*, S. J. Singh, J. Prakash, S. Patnaik and A. K. Ganguli, **Physica** C 470 1928 (2010).
50. D*ominance of magnetoelastic coupling in hexagonal multiferroic $YMnO_3$*, A. K. Singh, S. D. Kaushik, V. Siriguri and S. Patnaik, **Phys. Rev. B** 81, 184406 (2010).
51. *Magnetoelectric behavior of ferrimagnetic $Bi_xCo_{2-x}MnO_4$ (x = 0, 0.1 and 0.3) thin films*, N.E. Rajeevan, Ravi Kumar, D.K. Shukla, R.J. Choudhary, P. Thakur, A.K. Singh, S.K. Arora, I.V. Shvets, P.P. Pradyumnan, S. Patnaik, **J. Mag. Mag. Mat.** 323, 1760 (2011).
52. Magnetocapaciatnce in Ca_3CoMnO_6, S. D. Kaushik, S. Rayaprol, J. Saha, N. Mohapatra, V. Siruguri,P. D. Babu, and S. Patnaik, **J. Appl. Phys**. 109 (2011).
53. *Strong room temperature magnetism in highly resistive strained thin films of $BiFe_{0.5}Mn_{0.5}O_3$*, E.-M. Choi, S. Patnaik, Q. X. Jia, H. Wang, E. Weal, S. L. Sahonta, Z. Bi, J. Xiong, M. G. Blamire, and J. L. Macmanus-Driscoll, **Appl. Phys. Lett.** 98, 012509 (2011).
54. *Dielectric properties of Gd(3)Ba(2)Mn(2)Cu(2)O(12) manganocuprate,* S. Rayprol, S. D. Kaushik, N. Kumar, J. Saha, and S. Patnaik, **J. Appl. Phys.** 109, 07D709 (2011).
55. *High upper critical field in potassium flouride doped LaOFeAs superconductor*, S. J. Singh, J. Prakash, A. K. Ganguli, and S. Patnaik, **IEEE Trans. Appl. Supercond**. 21, 2870 (2011).
56. *An all-organic steroid–D–p-A modular design drives ferroelectricity in supramolecular solids and nano-architectures at RT*, D. Asthana, A. K. Singh, A. Pathak, P. K. Sukul, S. malik, R. Chatterjee, S. Patnaik, K. Rissanen, and P. Mukhopadhyay, **Chem. Comm.** 47, 8928 (2011).

57. *The effect of antimony doping on the transport and magnetic properties of Ce(O/F)FeAs*, J. Prakash, S. J. Singh, G. Thakur, S. Patnaik, and A. K. Ganguli, **Supercond. Sci. and Technol**. 25, 125008 (2011).
58. *Magnetic, magnetoresistance, and magnetodielectric properties of oxygen deficient charge ordered manganite*., *Pr0.5Ca0.5MnO3-δ ,* Karmakar, A. , Majumdar, S., Singh, A.K , Patnaik, S, Giri, S, **J. Mag. and Mag. Mat.** 324, 649 (2012).
59. *Signatures of spin-glass freezing in Co/CoO nanospheres and nanodiscs*, D. Srikala, V. N. Singh, B. R. Mehta, and S. Patnaik, **J. Mag. and Mag. Mat.** 324, 2512 (2012).
60. *Bulk superconductivity in Bismuth Oxysulfide* $Bi_4O_4S_3$, S. K. Singh, A. Kumar, B. Gahtori, Shruti, G. Sharma, S. Patnaik, V.P.S. Awana, **J. Am. Chem. Soc. 134** 16504 (2012).
61. *Appearance of Superconductivity in* $LaO_{0.5}F_{0.5}BiS_2$, V. P. S. Awana, Anuj Kumar, Rajveer Jha, S. K. Singh, Anand Pal, Shruti Kirtan, J. Saha, S. Patnaik **Solid State Communications** (2012).
62. *Study of Ni and Zn doped CeOFeAs: Effect on the structural transition and specific heat capacity*, S. J. Singh, J. Prakash. A. Pal, S. Patnaik, V. P. S. Awana, and A.K. Ganguli, **Physica C,** 49, 490 (2013).
63. *Magnetism driven ferroelectricity above liquid nitrogen temperature in* Y_2CoMnO_6, G. Sharma, J. Saha, S. D. Kaushik, V. Siruguri, and S. Patnaik **Appl. Phys. Lett. 103,** 012903 (2013).
64. *Evidence for fully gapped strong coupling s-wave superconductivity in* $Bi_4O_4S_3$, Shruti, P. Srivastava and S. Patnaik, **J. Phys. Cond. Mat.**, 25 312202 (2013).
65. *Evidence of Multiferroic characteristics in* $NdCrTiO_5$, J. Saha, G. Sharma, and S. Patnaik, **J. Mag. Mag. Mat.** 360, 34 (2014).
66. *Structural, electromagnetic and thermoelectric properties of* $Bi_4O_4S_3$ *superconductor,* P Srivastava, Shruti and S Patnaik, **Supercond. Sci. Tech.** 27 055001 (2014).
67. *Magnetic entropy change and critical exponents in double perovskite* Y_2NiMnO_6, G. Sharma, T. S. Tripathi,J. Saha, and S. Patnaik, **J. Mag. Mag. Mat.** 368, 318 (2014).
68. *Effect of O-and Mn-doping on superconductivity in* $FeTe_{0.5}Se_{0.5}$ *superconductor*, Thakur, G.S., Haque, Z., Neha, P., Gupta, L.C., Patnaik, S., Ganguli, A.K. **Zeitschrift fur Anorganische und Allgemeine Chemie**, 640 (6), pp. 1159-1163 (2014).
69. *Superconducting properties of indium-doped topological crystalline insulator SnTe*, V. K. Maurya, Shruti, P. Srivastava and S. Patnaik. **EPL**, 108 37010 (2014).

70. *Improper ferroelectricity in helicoidal antiferromagnet $Cu_3Nb_2O_8$,* G. Sharma, J. Saha, S. D. Kaushik, V. Siruguri, and S. Patnaik **Solid State Communication** 203, 54 (2015).
71. *Effect of pressure on superconductivity in indium doped topological crystalline insulator SnTe,* V. K. Maurya, R. Jha, Shruti, VPS Awana, and S. Patnaik, **J. Phys.: Condens. Matter 27** 242201 (2015).
72. *Superconductivity by Sr Intercalation in layered topological Insulator Bi_2Se_3*, Shruti, V. K. Maurya, P.Neha, P. Srivastava, and S. Patnaik, **Phys. Rev. B., 92,** 020506R (2015).
73. *Weak ferromagnetism in a noncentrosymmetric BiPd 4K superconductor*. R. Jha,R. Goyal, P. Neha, V. K. Maurya, A. K. Srivastava, A. Gupta,S. Patnaik, V. P. S. Awana, **Superconduct. Sci. Tech**. 29, 025008 (2015).
74. *Magneto-electric coupling in Ca3CoMnO6 thin films*, J. Saha, G. Sharma, S. D. Kaushik, V. Rani, Sudesh, V. Siruguri, S. Patnaik, **J. Mag. Mag. Mat**. 400, 282 (2016).
75. *Short range ferromagnetic, magneto-electric, and magneto-dielectric effect in ceramic Co3TeO6*, H. Singh, H. Ghosh, T. V. Chandrasekhar Rao,G. Sharma, J. Saha, S. Patnaik, S., **J. Appl. Phys**. 119, 044104 (2016).
76. *Improved superconducting properties of $La_3Co_4Sn_{13}$ with indium substitution*, P. Neha,P. Srivatsava, R. Jha, Shruti, V. P. S. Awana, S. Patnaik, **J. Alloys. Comp** Volume 665, 333 (2016).
77. *Evolution of microstructure and relaxor ferroelectric properties in (LazBa1-z)(Ti0.80Sn0.20)O3*, R. Kumar, K. Asokan, S. Patnaik, B. Birajdar, **J. Alloys. Comp**, 687, 197 (2016).
78. *Flux free growth of superconducting FeSe single crystals*, Maheshwari, P.K., Joshi, L.M., Gahtori, B., Srivastava, A.K., Gupta, A., Patnaik, S., Awana, V.P.S. **Materials Research Express**, 3, 076002 (2016).
79. *Single gap s-wave superconductivity in Nb2PdS5*, Shruti, R. Goyal, V.P.S. Awana, S. Patnaik, **Physica C: Superconductivity and its Applications**, 524, 24 (2016).
80. *Unusual non saturating Giant Magneto-resistance in single crystalline Bi2Te3 topological insulator,* R. Sultana, P. Neha, R. Goyal, S. Patnaik, V.P.S. Awana, **Journal of Magnetism and Magnetic Materials**, 428, 213 (2017).
81. *Evidence for trivial Berry phase and absence of chiral anomaly in semimetal NbP*, P. Sudesh, Kumar, P. Neha, T. Das, S. Patnaik, **Scientific Reports**, 7, 46062 (2017).
82. *Hidden transition in multiferroic and magnetodielectric CuCrO2 evidenced by ac-susceptibility,* Shukla, K.K., Pal, A., Singh, A., Singh, R., Saha, J., Sinha, A.K., Ghosh, A.K., Patnaik, S, Awasthi, A.M., Chatterjee, S. (2017) **EPL**, 118 (2), art. no. 27008.
83. *Synthesis and characterization of yttrium iron garnet (YIG) nanoparticles -*

Microwave material Sharma, V., Saha, J., Patnaik, S, Kuanr, B.K. (2017) **AIP Advances**, 7 (5), art. no. 056405.

84. *Dramatic variation of the multiferroic properties in Sr doped Ca1-xSrxMn7O12*Jain, P., Saha, J., Patnaik, S, Gupta, L.C., Ganguli, A.K., Chatterjee, R. (2017) **AIP Advances**, 7 (5), art. no. 055832, .
85. *Possibility for conventional superconductivity in Sr0.1Bi2Se3 from high-pressure transport studies* Manikandan, K., Shruti, Neha, P., Kalai Selvan, G., Wang, B., Uwatoko, Y., Ishigaki, K., Jha, R., Awana, V.P.S., Arumugam, S., Patnaik, S, (2017) **EPL**, 118 (4), art. no. 47008, .
86. *Evolution of relaxor properties in lanthanum (La) doped barium zirconate titanate* R Kumar, K Asokan, S Patnaik, B Birajdar, (2017) **Ferroelectrics**, 517 (1), 8-13
87. *YIG based broad band microwave absorber: A perspective on synthesis methods* Sharma, V., Saha, J., Patnaik, S, Kuanr, B.K. (2017) **Journal of Magnetism and Magnetic Materials**, 439, pp. 277-286.
88. *Enhanced ferromagnetism in edge enriched holey/lacey reduced graphene oxide nanoribbons* Sahu, V., Maurya, V.K., Singh, G., Patnaik, S, Sharma, R.K. (2017) **Materials and Design**, 132, pp. 295-301.
89. *Combined effect of oxygen annealing and La-doping in broadening the phase transition of Ba(Zr0.2Ti0.8)O3ceramics* Kumar, R., Asokan, K., Patnaik, S, Birajdar, B. (2018) **Journal of Alloys and Compounds**, 737, pp. 561-567.
90. *Magnetic structure driven ferroelectricity and large magnetoelectric coupling in antiferromagnet Co4Nb2O9* Srivastava, P., Chaudhary, S., Maurya, V., Saha, J., Kaushik, S.D., Siruguri, V., Patnaik, S, (2018) **Solid State Communications**, 273, pp. 39-43.
91. *High spin state driven magnetism and thermoelectricity in Mn doped topological insulator Bi2Se3*Maurya, V.K., Dong, C.L., Chen, C.L., Asokan, K., Patnaik, S, (2018) **Journal of Magnetism and Magnetic Materials**, 456, pp. 1-5.
92. *Facile synthesis of potassium intercalated p-terphenyl and signatures of a possible high Tc phase*, Neha, P., Bhardwaj, A., Sahu, V., Patnaik, S.(2018) **Physica C**: Superconductivity and its Applications, 554, pp. 1-7.
93. *High-Field Magneto-Conductivity Analysis of Bi2Se3 Single Crystal*, Sultana, R., Gurjar, G., Patnaik, S., Awana, V.P.S. (2018) **Journal of Superconductivity and Novel Magnetism**, 31 (10), pp. 3075-3078.
94. *Hikami-Larkin-Nagaoka (HLN) Treatment of the Magneto-Conductivity of Bi2Te3 Topological Insulator* Sultana, R., Gurjar, G., Neha, P., Patnaik, S., Awana, V.P.S.(2018) **Journal of Superconductivity and Novel Magnetism**, 31 (8), pp. 2287-2290.
95. *Suppression of transport spin-polarization of surface states with emergence of ferromagnetism in Mn-doped Bi2Se3,* Kamboj, S., Das, S., Sirohi, A., Roy Chowdhury, R., Gayen, S., Maurya, V.K., Patnaik, S., Sheet, G. (2018) **Journal of Physics Condensed Matter**, 30 (35), art. no. 355001.
96. *Low-energy excitations and non-BCS superconductivity in Nbx-Bi2Se3,* Sirohi, A., Das, S., Neha, P., Jat, K.S., Patnaik, S., Sheet, G. (2018) **Physical Review B**, 98 (9), art. no. 094523.
97. *Nature of Magnetoelectric coupling in corundum antiferromagnet $Co_4Ta_2O_9$,* S

Chaudhary, P Srivastava, SD Kaushik, V Siruguri, S Patnaik, (2018) **Journal of Magnetism and Magnetic Materials,** 475, 508-513.

98. *Nuanced superconductivity in endohedral gallide* Mo_8Ga_{41} P Neha, P Sivaprakash, K Ishigaki, G Kalaiselvan, K Manikandan, RS Dhaka, Y Uwatoko, S Arumugam, S Patnaik, (2018) **Materials Research Express**, 6 (1), 016002.
99. *Crystal growth and characterization of bulk Sb2Te3 topological insulator,* R Sultana, G Gurjar, S Patnaik, VPS Awana, (2018) **Materials Research Express,** 5 (4), 046107.
100. *Superconductivity in Mo8Ga41 driven by a site-selective mechanism* Sirohi, A., Saha, S., Neha, P., Das, S., Patnaik, S., Das, T., Sheet, G. Multiband (2019) **Physical Review B**, 99 (5), art. no. 054503, .

Conference proceedings

1. *Field coil specification for ECRH assisted start up in a TOKAMAK,* S. Patnaik, K. Sri Ram, M. S. Kalra, and S. Chaturvedi, **11th topical meeting on the technology of fusion energy**, New Orleans (1994).
2. *Direct measurement of penetration depth by inductive transition method for Bi-2223 platelets,* S. Patnaik, H. S. Gupta, R. C. Budhani, **DAE Solid State Symposium**, Bombay, India (1996)
3. *Apparatus for temperature and field dependent studies of magnetic penetration depth of high Tc samples using IC74LS04 as RF oscillator,* S. Patnaik, K. J. Singh, and R. C. Budhani, **DAE Solid state symposium**, Cochin, India (1997).
4. *Enhancement of pinning force density after heavy ion irradiation in H|| c-direction in Bi-2223 tape wires,* S. Patnaik, and R. C. Budhani, **DAE Solid State Symposium**, Cochin, India (1997).
5. *Experimental set up for studies of equilibrium and non-equilibrium photo effects in superconducting films,* L. K. Sahoo, Vivek Aji, K. J. Singh, S. Patnaik, and R. C. Budhani, **National Laser Symposium**, Ahmedabad, India (1997).
6. *Optimized pulsed laser deposition technique for thin films of magnetic and superconducting films,* K. J. Singh, V. Bhatt, N. Pandey, S. patnaik, C. Roy, L. K. Sahoo, M. K. Srivastava, and R. C. Budhani, **National Laser Symposium**, Ahmedabad, India (1997).
7. *Interplay of intrinsic and extrinsic pinning in heavy ion irradiated Bi-2223/Ag tape wires,* S. Patnaik, and R.C . Budani, **5th IUMRS International Conference**, Bangalore, India (1998).

8. *Temperature dependent magnetoresistance studies in irradiated and unirradiated Bi-2223/Ag tape wires,* S. Patnaik, A. Pasupathy, and R. C. Budhani, **DAE Solid State Symposium**, Kurukshetra, India (1998).
9. *Thermally activated Vortex dynamics in MgB_2 films,* S. Patnaik, Alex Gurevich and D. C. Larbalestier, **APS March Meeting**, Indianapolis, (2002).
10. *Specific Heat of MgB_2,* S. Patnaik, L. D. Cooley, A. Gurevich, A. A. Polyanskii, J. Y. Jiang, X. Y. Cai, A. A. Squitieri, M. T. Naus, M. K. Lee, J. H. Choi, L. Belenky, S. D. Bu, J. Letteri, X. Song, D. G. Schlom, S. E. Babcock, C. B. Eom, E. E. Hellstrom, and D. C. Larbalestier , **APS March meeting**, Seattle, USA, 2001
11. *Substantial enhancement in superconducting properties of MgB_2 after low energy light-ion irradiation,* S. D. Kaushik, Shrikant Saini, R. J. Choudhury, Ravikumar, C. L. Prajapat, G. Yashwant, P. K. Mishra, S. Patnaik, **DAE Solid State Symposium**, Amritsar, India (2004).
12. *Electronic Transitions in Fe-intercalated 1T- VSe_2*, C. S. Yadav, I. Naik, S. Patnaik, A. K. Rastogi, **DAE Solid State Symposium**, Amritsar, India (2004).
13. *Thermally Activated Vortex Dynamics in MgB_2* , S. Patnaik, **Xth International workshop on Vortex Dynamics**, TIFR, Mumbai (2005)
14. *Disorder induced modification in anisotropy of MgB_2*, S. D. Kaushik, Shrikant Saini, Ravi Kumar and S. Patnaik, **DAE Solid State Symposium**, Mumbai, India (2005)
15. *Tuning intraband scattering mechanism of MgB_2 through ion irradiation*, S. D. Kaushik and S. Patnaik, **APS March meeting**, Baltimore USA (2006).
16. *Structure and dielectric property of multiferroic $YMnO_3$*, A. K. Singh and S. Patnaik, **Proceedings of DAE Solid State Symposium** 51, 973 (2006).
17. *Dielectric anomaly in lattice mismatched $YMnO_3$*, A. K. Singh, M. Snure, A. Tiwari, S. Patnaik, **Proceedings of DAE Solid State Symposium** 52, 1159 (2007).
18. *Synthesis and characterization of Niobium nanoparticles*, D.Srikala and S. Patnaik, **Proceedings of national conference on nanomaterials and nanotechnology** 49 (2007).
19. *Apparatus for RF penetration depth measurement down to 2 K with GM cryocoolers*, D. Srikala and S. Patnaik, **Proceedings of DAE Solid State Symposium** 52, 433 (2007).
20. *Size effects on the magnetic properties of cobalt nanocubes*, D. Srikala and S. Patnaik, **Proceedings of DAE Solid State Symposium** 53, 395 (2008).
21. *Iron-Arsenic based layered superconductor $La_{0.8}K_{0.2}O_{0.8}F_{0.2}FeAs$ with T_c = 26.45 K*, S.J. Singh, J. Prakash, A. K. Ganguli, and S. Patnaik, **Proceedings of DAE Solid State Symposium** 52, 923 (2008).
22. *Multiferrocity in $Bi_2Fe_4O_9$ near room temperature*, A. K. Singh and S. Patnaik, **Proceedings of DAE Solid State Symposium** 52, 1147 (2008)**.**

23. *Origin of multiferroicity in hexagonal $Y_{1-x}Dy_xMnO_3$*, A. K. Singh, S. D. Kaushik, and V. Siriguri and S. Patnaik, **March meeting of the American Physical Society**, Pittsburg (USA), 16-20 March (2009).

24. *Microscopic origin of multiferroicity in hexagonal $YMnO_3$ via in field neutron diffraction and dielectric measurements*, A. K. Singh, S. D. Kaushik, V. Siriguri, and S. Patnaik. **Conference on neutron scattering and mesoscopic systems,** International Center/ Goa University, Oct 12-14, (2009).

25. *Modification in magnetoelectric coupling in Dy doped $YMnO_3$*. S. D. Kaushik, A. K. Singh, V. Siriguri and S. Patnaik **Conference on neutron scattering and mesoscopic systems,** International Center/ Goa University, Oct 12-14, (2009).

26. *Observation of magneto-electric coupling in hexagonal $YMnO_3$ via infield neutron diffraction experiment*, A. K. Singh, S. D. Kaushik, V. Siriguri and S. Patnaik, **Material Research Society (MRS) fall meeting at Boston**, USA, 30 Nov – 4 Dec (2009).

27. *On the origin of magneto-electric coupling in hexagonal $YMnO_3$*, **A. K. Singh**, S. D. Kaushik, V. Siriguri and S. Patnaik **Proceeding of 54th DAE Solid State Physics Symposium**, page 1153 vol 54 (2009).

28. *Effect of epitaxial strain on the magnetoelectric coupling of lattice mismatched $YMnO_3$ thin films grown on Sapphire (0001) substrate with conducting $Zn_{0.99}Ga_{0.01}O$ bottom contact*, Anil K. Singh, Michael Snure, Ashutosh Tiwari and S. Patnaik, **Material Research Society (MRS) fall meeting at Boston**, USA, 30 Nov – 4 Dec (2009).

29. *Property variation with shape in ferromagnetic cobalt nanocubes* D. Srikala and S. Patnaik, **International Conference on Advanced Nanomaterials and Nanotechnology (ICANN),** Guwahati, Dec 9-11 (2009).

30. *Enhancement in transition temperature, upper critical field and critical current density in the Y-doped CeOFFeAs superconductor* S. J. Singh, J. Prakash, A. K. Ganguli and S. Patnaik, **ICMS-ICMR winter School on Chemistry and physics of materials**, JNCASR, Banglaore, India Nov 30-Dec 05, 2009.

31. *Critical current density and remanent magnetization in $LaO_{0.8}F_{0.2}FeAs_{0.95}Sb_{0.05}$ superconductor*, S. J. Singh, J. Prakash, A. K. Ganguli and S. Patnaik **Proceeding of 54th DAE Solid State Physics Symposium**, page 801 vol 54 (2009).

32. *Transport properties of superconducting $Fe_{1.08}Se$*, P. Kumar, S. J. Singh and S. Patnaik, **Proceeding of 54th DAE Solid State Physics Symposium**, page 797 vol 54 (2009).

33. *Synthesis and Characterization of PbSe nanoparticles*, D. Srikala, and S. Patnaik, **International Conference on Nano-Science and Technology (ICONSAT)**, IIT Bombay, Feb 17-20, (2010).

34. *Magnetic behaviour of oxygen passivated cobalt nanoparticles*, D. Srikala and S. Patnaik, **Materials Research Society-Spring Meeting**, **San Fransisco,** April 5-12 (2010) San Francisco, California, USA.

35. *Synthesis and Characterization of PbSe and $Pb_{1-x}Co_xSe$ nanoparticles*, D. Srikala and S. Patnaik, **Materials Research Society-Spring Meeting**, **San Fransisco,** April 5-12 (2010) San Francisco, California, USA.

36. *Effect simultaneous carrier doping in the charge reservoir and conducting layers of superconducting $CeO_{0.9}F_{0.1}Fe_{1-x}Co_xAs$*, S. J. Singh**,** J. Prakash**,** S. Patnaik and A. K. Ganguli, **Conference on Recent Advances in Correlated Electron Systems**, Indian Institute of Technology Guwahati, India, 18-20 Jan 2010.

37. *High Upper critical field in potassium fluoride doped LaOFeAs superconductor,* S. J. Singh**,** J. Prakash**,** S. Patnaik and A. K. Ganguli, **Applied Superconductivity Conference**, Washington D.C. August 2- 7 (2010).

38. *Spin frustrated magnets, A novel route to multiferroicty*, S. Patnaik, Invited talk **at 55th DAE Solid State Physics Symposium**,(Manipal, Dec 27th, 2010), **AIP Conf. Proceedings.** 1349, 29 (2011).

39. *Doping Effects Towards Tuning Magneto-Elasticity in $YMnO_3$*, A. K. Singh, S. D. Kaushik, V. Siriguri, and S. Patnaik, **AIP Conf. Proceedings**. 1349, 1023 (2011).

40. *Effect of Dy doping in frustrated multiferroic h-$YMnO_3$*, S. D. Kaushik, A. k. Singh, V. Siriguri, and S. Patnaik. **AIP Conf. Proceedings**. 1349, 1283 (2011).

41. *New Oxypnictide Superconductors,* A.K. Ganguli, J. Prakash, S. J. Singh, and S. Patnaik, **AIP Conf. Proceedings**. 1349, 37 (2011).

42. *Study of Thermoelectric Power and Superconducting Gap in $CeO_{0.9}F_{0.1}Fe_{1-y}Co_yAs$*, S.J. Singh, J. Prakash, A.k. Ganguli, and S. Patnaik, **AIP Conf. Proceedings**. 1349, 903 (2011).

43. *Structural and Superconducting Properties of Ce-Based Ferropnictides,* J. Prakash, S. J. Singh, S. Patnaik, and A. K. Ganguli, **AIP Conf. Proceedings**. 1349, 917 (2011).

44. *Study of Transport and Magnetic properties in New BiS_2 based layered $LaO_{0.5}F_{0.5}BiS_2$ superconductor*, Shruti, A. Kumar, R. Jha, V. P. S. Awana, and S. Patnaik (presented in DAE SSPS 2012, IIT Mumbai), **AIP Conf. Proceedings**.(2012).

45. *Possibility of spatial inversion symmetry breaking by magnetic ordering in Y_2CoMnO_6,* G. Sharma, J. Saha, and S. Patnaik (presented in DAE SSPS 2012, IIT Mumbai), **AIP Conf. Proceedings**. (2012).

46. *Role of Magnetostriction in Magnetoelectric properties of $NdCrTiO_5$,* J. Saha, G. Sharma, S. Patnaik (presented in DAE SSPS 2012, IIT Mumbai), **AIP Conf. Proceedings**.(2012).

47. *Unusual Multiferroicity in $Cu_3Nb_2O_8$,* G. Sharma, J. Saha, and S. Patnaik (DAE SSPS 2013, Patiala), **AIP Conf. Proceedings** (2014).

48. *Unusually High Temperature Multiferroicity in Y_2CoMnO_6 ,*G. Sharma, J. Saha, and S. Patnaik, **IUMRS**, Indian Institute of Science, Bangalore (2014).

49. *Ferromagnetism through Cr doping in topological insulator Bi_2Te_3,*V. K. Maurya and S. Patnaik (DAE SSPS 2013, Patiala, India), **AIP Conf. Proceedings** (2014).

50. *Superconductivity in In doped topological crystalline insulator SnTe,* V. K. Maurya, Shruti, P. Neha, P. Srivastava and S. Patnaik (DAE SSPS 2013, Patiala, India), **AIP Conf. Proceedings** (2014).

51. *Design and calibration of Z-Meter for Simultaneous Thermal transport Measurements at High Temperature*, B. Singh, D. Shukla, P. Srivastava, and S. Patnaik (DAE SSPS 2013, Patiala, India), **AIP Conf. Proceedings** (2014).

52. *Superconductivity and pairing symmetry in $Bi_2O_4S_3$ superconductor*,Shruti, P. Srivastava and S. Patnaik, **IUMRS**, Indian Institute of Science, Bangalore (2014)

53. *Strong coupling S- wave superconductivity in $Bi_4O_4S_3$*, Shruti and S. Patnaik Presented (Oral) in **APS March meeting** Colorado, USA held on 2-7 March (2014).

54. *Multiferroic Behaviour in Double Perovskites Y_2XMnO_6 (X = Co, Ni)* G. Sharma, J. Saha, and S. Patnaik, **Material Research Society (MRS) Spring Meeting**, San Francisco, USA April 21 – 25 (2014).

55. *Anisotropy in Upper Critical Field of $FeTe_{0.55}Se_{0.45}$*, Shruti, G. Sharma and S. Patnaik, (Presented in DAE SSPS 59(2014) VIT Vellore), **AIP conference proceedings** (2015).
56. *Synthesis and Characterization of $La_3Co_4Sn_{13}$ superconductor,* P.Neha, P.Srivastava, Shruti, J.Saha and S. Patnaik, (Presented in DAE SSPS 59(2014) VIT Vellore), **AIP conference proceedings** (2015).
57. *Anti- Ferromagnetism Through 'Mn' doping in Topological Insulator Bi_2Se_3* V.K.Maurya,P.K.Yadav and S. Patnaik, (Presented in DAE SSPS 59(2014) VIT Vellore), **AIP conference proceedings** (2015).
58. *Optical and Electrical Properties of Ca_3CoMnO_6 Thin Film Grown by Pulsed Laser Deposition* J. Saha, G. Sharma, Varsha Rani and S. Patnaik, (Presented in DAE SSPS 59(2014) VIT Vellore), **AIP conference proceedings** (2015).
59. *Possible superconductivity in Weyl semimetal NbP* P. Sudesh, Kumar, S. Patnaik, **AIP Conference Proceedings,** 1731, 140063 (2016).
60. *Synthesis, microstructure and dielectric properties of zirconium doped barium titanate,* R. Kumar, K. Asokan, S. Patnaik, B. Birajdar, **AIP Conference Proceedings**, 1731, 030025 (2016).
61. *Emergence of superconductivity in topological insulator Bi2Se3 by Sr intercalation*, Shruti, V.K. Maurya, P. Srivastava, S. Patnaik, **AIP Conference Proceedings**, 1731, 130046 (2016).
62. *High temperature magneto-electric effect in yittrium iron garnet (YIG),* J. Saha, S. Chaudhary, P. Majumdar, B.K. Kuanr, S. Patnaik, **AIP Conference proceedings**, 1731, 140056 (2016).
63. *Pressure effects on topological crystalline insulator SnTe and derived superconductor Sn0.5In0.5Te*, V.K. Maurya, Shruti, R. Jha, V.P.S. Awana, S. Patnaik, **AIP Conference Proceedings**, 1731, 100011 (2016).
64. *Synthesis and characterization of Bi deficient Bi3Ni superconductor,* P. Neha, P. Srivastava, M.K. Kanojia, S.K. Jha, S. Patnaik, AIP Conference Proceedings, 1731, 130050 (2016).
65. *Synthesis and characterization of indium doped La3Co4Sn13 skutterudite superconductor,* P. Neha, P. Srivastava, S. Shruti, S. Sudhesh, S. Patnaik, **AIP Conference Proceedings**, 1728, 020485 (2016).
66. *Possible Superconductivity in Weyl Semimetal NbP*, P. Kumar, Sudhesh and S. Patnaik. (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).
67. *High Temperature Magneto-Electric Effect in Yttrium Iron Garnet (YIG),* J. Saha, S. Chaudgary, P. Majumdar, B. K. Kuanr and S. Patnaik. (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).

68. *Emergence of Superconductivity in Topological Insulator Bi_2Se_3 by Sr intercalation.* Shruti, V. K. Maurya, P. Srivastava and S. Patnaik, (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).
69. *Synthesis and Characterization of Bi_3Ni Superconductor*, P. Neha, P. Srivastava, M. K. Kanojiya, S. K. Jha and S. Patnaik, (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).
70. *Synthesis, Microstructure and Dielectric Properties of Zirconium Doped Barium Titanate,* R. Kumar, K. Asokan, S. Patnaik, B. Birajdar , (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).
71. *Pressure Effect On Topological Crystalline Insulator SnTe and Derived Superconductor $Sn_{0.5}In_{0.5}Te.$,* V. K. Maurya, Shruti, Rajveer Jha, V.P.S. Awana and S. Patnaik. (Presented in DAE SSPS 60(2015) Amity University, Noida), **AIP conference proceedings** (2016).
72. Neha, P., Sharma, B., **Patnaik, S**. "Synthesis and characterization of binary intermetallic superconductor Mo8Ga41" **AIP conference proceedings** (2017), 1832, art. no. 130048.
73. Chaudhary, S., Gurjar, G., Saha, J., **Patnaik, S.** "Study of multi-ferrocity in Ba3NbFe3Si2O14" **AIP conference proceedings** (2017), 1832, art. no. 130045.
74. Kumar, P., Nagpal, V., Sudesh, **Patnaik, S**. "Exceptional magneto-resistance in 3D Dirac semimetal Bi0.96Sb0.04 " **AIP conference proceedings** (2017), 1832, art. no. 140033.
75. Gupta, S., Saha, J., Kaushik, S.D., **Patnaik, S**., Siruguri, V., Sathe, V.G. "Magnetodielectric effect in Eu0.75Y0.25MnO3" **AIP conference proceedings** (2017), 1832, art. no. 130054 .
76. Kumar, R., Asokan, K., **Patnaik, S**., Birajdar, B. "Evolution of relaxor properties in lanthanum (La) doped barium zirconate titanate" ***Ferroelectrics*** (2017), 517 (1), pp. 8-13.
77. Chaudhary, S., Srivastava, P., **Patnaik, S**. "Evidence of magneto-dielectric effect in honeycomb oxide Na2Co2TeO6" **AIP conference proceedings** (2018), 1942, art. no. 130045.
78. Nagpal, V., Kumar, P., Sudesh, **Patnaik, S**. "Low temperature resistivity plateau and non-saturating magnetoresistance in Type-II Weyl semimetal WP2" ***AIP Conference Proceedings*** (2018), 1942, art. no. 110035 .
79. Gurjar, G., Sharma, V., **Patnaik, S**., Kuanr, B.K. "Control of magnetization dynamics and magnetic properties of PLD deposited YIG thin films on different substrates" ***AIP Conference Proceedings*** (2018), 1942, art. no. 040021.

80. Srivastava, P., Chaudhary, S., **Patnaik, S.** "Large magnetodielectric response in spinel Ni0.5Co0.5Cr2O4"***AIP Conference Proceedings*** (2018), 1942, art. no. 130048.

81. Jat, K.S., Nagpal, V., Sagar, A.D., Neha, P., **Patnaik, S**. "Coexistence of charge density wave and superconductivity in Cu0.10TiSe2" ***AIP Conference Proceedings*** (2018), 1942, art. no. 130047.