

Sanjay Kumar Upadhyay

Curriculum Vitae

Department of Physics,
HNB Garhwal University
(A Central University)
Srinagr Garhwal- 246174
Uttarakhand , India
(E-mail: skuphysics@gmail.com)
Contact no. : +91-8454882471



SUMMARY:

- Consistent excellent academic record with first division right from the school to master's degree.
- Qualified **National Eligibility Test (NET)** in Physical Science conducted by CSIR-UGC (India).
- **34 publications** in peer reviewed international journals.
- Six and half year postdoc experience at TIFR Mumbai and IISc Bangalore, India with Prof. E. V. Sampathkumaran and Prof. D.D. Sarma respectively.
- Presented research work at 16 National / International conferences.
- **Best student award** at 9th Asian Meeting on ferroelectricity (AMF-14) held at **Shanghai (China)** during October, 2014.
- **Best thesis presentation award** by UGC-DAE Consortium for Scientific Research, Indore (India).
- Awarded various **international travel grant** from DST, CSIR (Gov. of India).
- **Guest editor** (2021-2022) of Journal *Magnetism* by MDPI, Basel, Switzerland.

RESEARCH AREA:

- ✓ Multiferroic: Exploration of new type-II Multiferroic materials and composite oxides
- ✓ Ferroelectrics (Electro-caloric, Relaxor, Aging behavior etc.).
- ✓ Magnetic systems (strongly correlated electron system, spin chain, spin glass etc.).
- ✓ Preparation of ceramics with Microwave assisted radiant sintering.
- ✓ Epitaxial ferroelectric/Multiferroic thin films by PLD.
- ✓ Structural Analysis using X-ray diffraction.
- ✓ Li-ion batteries related oxides materials.

EXPERIMENTAL SKILLS:

- Expertise in oxide sample preparation with solid-state, sol-gel and microwave sintering.
- Expertise in preparing thin films with spin-coating (*Spin 150*) and PLD technique (*KrF-excimer laser by Lambda Physic COMPex*).
- Familiarity and expertise with various measurement techniques such as ferroelectric hysteresis loop (*Radiant precision system*), x-ray diffraction (*D-8 Advance Brooker*),

- Mössbauer spectroscopy (^{57}Fe and ^{119}Sn), Raman spectroscopy (*HR800 micro-Raman spectrometer*), Dielectric measurement (*Agilent LCR meter*), Pyroelectric measurements (*Kaithly electrometer*) and dc-Magnetization (*Quantum design PPMS and SQUID*), ac-Magnetization (*Quantum design MPMS*), Specific heat (*Quantum design PPMS*).
- Measured magneto-electro (ME) coupling in the prepared ME ceramics using dielectric and pyroelectric measurement in the presence of high magnetic field (H= 140 kOe) and low temperature (down to 2 K).
 - Fabricated and designed sample holder, used for high temperature ferroelectric, leakage current and electric poling measurements.

COMPUTER PROGRAMM KNOWLEDGE:

- Expertise in various software programs such as FullProf program for the analysis of powder x-ray diffraction patterns (Rietveld Refinements).
- Vesta for the structural analysis.
- ImagJ and WxSM for SEM and AFM image respectively.
- General software programs such as MATLAB, ORIGIN etc.

CAREER HIGHLIGHTS

Organization	HNB Garhwal University (Central University) Srinagar , Uttarakhand (India)
Designation	Assistant Professor June (2022)-Present
Organization	Indian Institute of Science, Bangalore (India)
Designation	Post doc fellow (With Prof. D. D. Sarma) December (2018)-June (2022)
Organization	Tata Institute of Fundamental Research, Mumbai (India)
Designation	Post doc fellow (With Prof. E. V. Sampathkumaran) October (2015)-October (2018)
Organization	UGC-DAE-Consortium for Scientific Research, Indore (India)
Designation	Research Scholar (With Dr. V. R. Reddy) July (2010)-October (2015)

ACADEMIA

- Ph. D. (2016)** Doctor of Philosophy (Ferroelectrics, Multiferroic composites): UGC-DAE Consortium for scientific research, Indore, India. (*Preparation and study of BaTiO₃ based ferroelectric and magneto-electric composites*).
- M. Sc. (2010)** Master of Science (Physics): **76%**; G. B. Pant University of Ag. & Tech., Pantnagar, India.

B. Sc. (2007)

Bachelor of Science : **64%**; Kumaun University, Nainital, India.

AWARDS AND ACCOMPLISHMENTS

- Awarded **DST International Travel Grant (June 2022) to visit Amsterdam (Netherlands).**
- Awarded **DST International Travel Grant (September 2017 and September 2013)** to visit **San Antonio, Texas (USA)** and **Krakow (Poland)** respectively to attend international conference.
- Nominated by **DST, Govt. of India** to participate in **70th Meeting of Nobel Laureates & Students** at **Lindau, Germany (2020).**
- Awarded **CSIR International Travel Grant (July 2017)** to visit Prague (The Czech Republic) to attend international conference.
- Awarded **Best Thesis Presentation Award** at Annual day presentation of UGC-DAE CSR Indore (M.P.), India on 2nd December 2014.
- Awarded **Student Award** at 9th Asian meeting on ferroelectricity (AMF-2014) held at **Shanghai (China)** and organized by **Japanese and Chinese academy of science.**
- Awarded **CSIR-Senior Research Fellowship** conducted by **CSIR India (2014).**
- Qualified **National Eligibility Test** (Lectureship) conducted by CSIR-UGC India (June-2010); All India Rank-69.
- Qualified **Joint Entrance Screening Test** (2010); 92.3 percentile (A joint entrance test for leading physics research centers in India).
- One of the article [**J. App. Phys., 113, 114107(2013)**] certified as fastest downloaded paper (for first 100 downloads) by **editor of Journal of Applied Physics.**
- Reviewer of **Applied Physics Letter, Physica Status Solidi B: Basic Solid State Physics, AIP Advances** journal and **AIP Proceeding.**
- **Guest editor** (2021-2022) of Journal *Magnetism* by MDPI, Basel, Switzerland.

SELECTED PUBLICATIONS

1. **S K Upadhyay** and E.V. Sampathkumaran, “Multiferroicity in a spin-chain compound, Tb_2BaCoO_5 , with exceptionally large magnetodielectric coupling in polycrystalline form, *Applied Physics Letter*, **112**, 262902 (2018). **I.F.:** 3.971
2. **S K Upadhyay**, P.L. Paulose and E.V. Sampathkumaran, “Extraordinarily large intrinsic magnetodielectric coupling of Tb member within the Haldane spin-chain family, R_2BaNiO_5 ” *Physical Review B*, **96**, 014418 (2017). **I.F.:** 3.908
3. A. Panchwancee, **S. K. Upadhyay**, N.P.Lalla, V. Sathe and A. Gupta and V.R. Reddy. “Low temperature Raman, high magnetic field ^{57}Fe Mössbauer and x-ray diffraction study of magneto-dielectric coupling in polycrystalline $GdFeO_3$ ” *Physical Review B* **99**, 064433 (2019). **I.F.:** 3.908.
4. R Kumar, Sudhindra Rayaprol, Sarita Rajput, Tulika Maitra, D.T. Adroja, Kartik K Iyer, **S. K. Upadhyay** and E.V. Sampathkumaran, “Existence of a critical canting angle of magnetic moments to induce multiferroicity in the Haldane spin-chain system, Tb_2BaNiO_5 ,” *Physical Review B* **99**, 100406(R) (2019). **I.F.:** 3.908.

5. **S. K. Upadhyay** and E. V. Sampathkumaran, “Destruction of multiferroicity in Tb_2BaNiO_5 by Sr-doping and its implication to magnetodielectric coupling”, *Journal of Physics: Condensed Matter* **31**, 39LT01(2019). I.F.: 2.745.
6. S. Gupta, **S. K. Upadhyay**, V. Sathe, V. Siruguri and E. V. Sampathkumaran, “Observation of magnetoelastic and magnetoelectric coupling in Sc doped $BaFe_{12}O_{19}$ due to spin-glass-like phase”. *Journal of Physics: Condensed Matter* **31**, 295701 (2019). I.F.: 2.745.
7. **S. K. Upadhyay** and E. V. Sampathkumaran, “Persistence of large magnetodielectric coupling anomalies and multiferroicity for significant dilution of Tb sublattice by Y in Tb_2BaNiO_5 ” *Journal of Applied Physics* **125**, 174106 (2019). I.F.: 2.877
8. **S K Upadhyay**, K K Iyer and E.V. Sampathkumaran, “Magnetic behavior of metallic kagome lattices, $Tb_3Ru_4Al_{12}$ and $Er_3Ru_4Al_{12}$ ”, *Journal of Physics: Condensed Matter* **29**, 325601 (2017). I.F.: 2.745.
9. **S K Upadhyay**, K K Iyer, S. Gohil, S. Ghosh, P.L. Paulose and E.V. Sampathkumaran. “Pyrocurrent anomalies and intrinsic magnetodielectric behavior near room temperature in $Li_2Ni_2Mo_3O_{12}$, a compound with distorted honeycomb and spin-chains” *Scientific Reports*, **7**, 4449 (2017). I.F.: 4.996.
10. **S K Upadhyay**, K K Iyer, S. Rayaprol, V. Siruguri and E.V. Sampathkumaran, “Re-entrant spin-glass freezing and magneto-dielectric behavior of Li_3NiRuO_5 , a layered rock-salt related oxide” *Journal of Material Chemistry C*, **5**, 5163 (2017). I.F.: 8.067.
11. **S.K.Upadhyay**, V.R. Reddy, P. Bag, R. Rawat, S.M. Gupta and Ajay Gupta, “Electrocaloric effect in lead-free Sn doped $BaTiO_3$ ceramics at room temperature and low applied fields” *Applied Physics Letter* **105**, 112907 (2014). I.F.: 3.971.
12. **S.K.Upadhyay** and V.R. Reddy, “Study of $0.9BaTiO_3-0.1Ni_xZn_{1-x}Fe_2O_4$ magneto-electric composite ceramics”, *Journal of Applied Physics* **113**, 114107 (2013). I.F.: 2.877.

PUBLICATIONS

13. R. Kumar, S. Rajput, T. Maitra, A. Hoser, S. Rayaprol, **S. K. Upadhyay**, K. K Iyer, K. Maiti, and E.V. Sampathkumaran “Origin of destruction of multiferroicity in Tb_2BaNiO_5 by Sr doping and its implications”, *Journal of Alloys and Compounds*, **862**, 158514 (2021) I.F.: 5.316.
14. **S.K. Upadhyay**, E.V. Sampathkumaran, S. Rayaprol, and A. Hoser, “Magnetic and magnetodielectric behavior of the Haldane spin-chain system, Ho_2BaNiO_5 ” *Material Research Express (IOP)*, **6** (2019) 036107. I.F.: 1.941.
15. S. Rayaprol, A. Hoser, **S.K. Upadhyay** and E.V. Sampathkumaran, Neutron diffraction study of a metallic kagome lattice, $Tb_3Ru_4Al_{12}$, *Journal of Magnetism and Magnetic Materials*, **477**, 83 (2019). I.F.: 2.993.
16. E.V. Sampathkumaran, K K Iyer, **S K Upadhyay** and A. Hoser, “Anisotropic re-entrant spin-glass features in a metallic kagome lattice, $Tb_3Ru_4Al_{12}$ ”, *Solid state communications*, **288**, 64 (2019). I.F.: 1.804.
17. R. Kumar, **S. K. Upadhyay**, Y. Xiao, W. Ji and D. Pal “Multiferroicity in collinear spin system: The Spinels $Co(Cr_{0.95}Fe_{0.05})_2O_4$ and $Co(Cr_{0.925}Fe_{0.075})_2O_4$ ”. *Journal of Physics D: Applied Physics* **51**, 385001 (2018). I.F.: 3.207.
18. M. Kumar, D. M. Phase R. J. Choudhary, **S. K.Upadhyay** and V. R .Reddy “Microwave assisted radiant hybrid sintering of $YMnO_3$ ceramic: Reduction of microcracking and leakage current” *Ceramics International* **44**, 8196 (2018). I.F.: 5.532.

19. **S.K. Upadhyay**, P. L. Paulose, K.K. Iyer and E.V. Sampathkumaran, “Spin glass behavior and pyro-electric anomalies in new Lithium-based oxide, $\text{Li}_3\text{FeRuO}_5$ ” *Physical Chemistry Chemical Physics* 18, 23348 (2016). I.F.: 3.676.
20. S. Ial, **S K Upadhyay**, K. Mukherjee, C. S. Yadav, “Evolution of magnetic and dielectric properties in Sr-substituted high temperature multiferroic YBaCuFeO_5 ” *Europhysics letters* 117, 67006 (2017). I.F.: 1.947.
21. **S K Upadhyay**, K K Iyer and E.V. Sampathkumaran, “Magnetic behavior of new compounds, Gd_3RuSn_6 and Tb_3RuSn_6 ” *Journal of Magnetism and Magnetic Materials*, 441, 180 (2017). I.F.: 2.993.
22. **S.K. Upadhyay**, V.R. Reddy, S.M. Gupta, N.P. Lalla and K Singh, “Co-existence of ferroelectric and relaxor phase in polycrystalline Sn doped BaTiO_3 and tuning their phase fraction with electric field” *Solid state communications* 255-256, 42 (2017). I.F.: 1.804.
23. **S.K. Upadhyay**, I. Fatima and V. R. Reddy, “Study of Electro-Caloric Effect in Ca and Sn co-Doped BaTiO_3 Ceramic” *Materials Research Express (IOP)* 4, 046303 (2017). I.F.: 1.941.
24. **S K Upadhyay**, K K Iyer and E.V. Sampathkumaran, “Dielectric and multiferroic behavior in $\text{Sm}_2\text{BaNiO}_5$, a Haldane spin-chain compound”, *Physica B* 524 123 (2017). I.F.: 2.88.
25. **S.K. Upadhyay**, K.K. Iyer, S. Rayaprol, P.L. Paulose and E.V. Sampathkumaran, “A rock-salt-type Li-based oxide, $\text{Li}_3\text{Ni}_2\text{RuO}_6$, exhibiting a chaotic ferrimagnetism with cluster spin-glass dynamics and thermally frozen charge carriers” *Scientific Reports (Nature)* 6, 31883 (2016). I.F.: 4.996.
26. **S.K.Upadhyay**, V.R. Reddy, S. M. Gupta, N. Chauhan and Ajay Gupta, “Reduced leakage current and improved ferroelectricity in magneto-electric composite ceramics prepared with microwave assisted radiant hybrid sintering” *AIP Advances* 5, 047135 (2015). I.F.: 1.548.
27. **S.K.Upadhyay**, V.R. Reddy, Ajay Gupta, V. Sathe, R.J.Choudhary, V.Ganesan and D.M.Phase, “Effect of $\text{Ni}_{0.5}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$ (NZFO) layer thickness on the magneto-electric properties of BaTiO_3 (BTO)-NZFO composite bilayer thin films” *Materials Research Express (IOP)* 1, 026101 (2014). I.F.: 1.941.
28. V.R. Reddy, **S.K.Upadhyay**, A. Gupta, A.M.Awsathi and S. Hussain, “Enhanced dielectric and ferroelectric properties of BaTiO_3 ceramics prepared by microwave assisted radiant hybrid sintering” *Ceramics International* 40, 8333 (2014). I.F.: 5.532.
29. V.R. Reddy, D. Kothari, **S.K.Upadhyay**, A. Gupta, N. Chauhan and A.M.Awsathi, “Reduced leakage current of multiferroic BiFeO_3 ceramics with microwave synthesis” *Ceramics International* 40, 4247 (2014). I.F.: 5.532.
30. **S.K.Upadhyay**, V.R. Reddy and N. Lakshmi, “Study of $(1-x)\text{BaTiO}_3 - x\text{Ni}_{0.5}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$ ($x=5, 10$ and 15%) magneto-electric ceramic” *Journal of Asian Ceramic societies* 1, 346 (2013). I.F.: 3.125.
31. **S.K.Upadhyay** and V.R.Reddy, “Study of ferroelectric hysteresis scaling exponents in aged polycrystalline BaTiO_3 ” *Ferroelectrics* 445, 147 (2013). I.F.: 0.69.
32. D. Kothari, **S.K.Upadhyay**, C. Jariwala, P. M. Raole and V.Raghavendra Reddy “Reduced leakage in epitaxial BiFeO_3 films following oxygen radio frequency plasma treatment”, *Journal of Applied Physics* 113, 214109 (2013). I.F.: 2.877.

33. **S.K.Upadhyay**, V.R. Reddy, K. Sharma, A. Gome and A. Gupta., “Study of aging and de-aging behavior of un-doped polycrystalline BaTiO₃”, *Ferroelectrics* 437, 171 (2012). I.F.: 0.69.
34. **Sanjay Upadhyay**, H. Chandra, M. Joshi & D.P. Joshi, “Thermo-elastic properties of minerals at high temperature”, *Pramana J. Physics* 76, 183 (2011). I.F.: 1.688.

Conference Proceeding

1. R. Samanta, **S.K. Upadhyay**, S. Mujumdar, “Interference effect in second harmonic light emitted from sub-micron size nonlinear particles”, Workshop on Recent Advances in Photonics, *WRAP 2022*, (2022).
2. **S. K. Upadhyay**, and E. V. Sampathkumaran, “Absence of Ferroelectric Features in Eu₂BaNiO₅: An Anomalous Case Within This Rare-Earth Family” *AIP Conf. Proc.* 1942, 130061 (2018).
3. **S. K. Upadhyay**, K. K. Iyer and E. V. Sampathkumaran, “Magnetic behavior of Li₃Co₂RuO₆” *AIP Conf. Proc.* 1832, 130001 (2017).
4. D. Kothari, **S.K.Upadhyay**, C. Meneghini, V.R. Reddy, G. Aquilanti and A. Gupta, Structural and magnetic study of La doped multiferroic BiFeO₃”, *AIP Conf. Proc.* 1447, 1319 (2012).

CONFERENCES/WORKSHOPS: (National / International)

Oral Presentation:

1. **14th International meeting on ferroelectricity (IMF-14)** held at **San Antonio (USA)** during September (4-8) 2017.
2. **9th Asian Meeting on ferroelectricity (AMF-14)** held at **Shanghai (China)** during October (26-30) 2014.
3. **RSWPM-13** held at UGC-DAE-CSR Indore (M.P.) during December (23-24) 2013.
4. **13th International meeting on ferroelectricity (IMF-13)** held at **Krakow (Poland)** during September (2-6) 2013.

Poster Presentation:

1. **36th International Conference on the Applications of the Mössbauer Effect, (ICAME 2021)** held at **Romania** during September (05-10) 2021.
2. **Intermag-2018** held at **Singapore** during April (23-27) 2018.
3. International conference on strongly correlated electron system (**SCES-2017**) held at **Prague (The Czech Republic)** during July (17-21) 2017.
4. **61st DAE-SSPS** held at KIIT University, Bhubaneswar during December (16-30) 2016.
5. **10th Asian Meeting on ferroelectricity (AMF-16)** held at **New Delhi (India)** during November (7-11) 2016.
6. **59th DAE-SSPS** held at VIT University, Vellore, during December (16-20) 2014.
7. **58th DAE-SSPS** held at Thaper University, Patiala during December (17-21) 2013.
8. **MAGMA-2013** held at IIT Guwahati during December (5-7) 2013.

9. **Physics of Phase transition-2013** held at UGC-DAE-CSR Indore (M.P.) during October (23-24) 2013.

10. **57th DAE-SSPS** held at IIT Bombay (Maharashtra) during December (3-8) 2012.

11. **56th DAE-SSPS** held at SRM University Chennai, during December (19-23) 2011.

Workshop attended:

1. One-day hybrid workshop On **Advanced Magnetic Materials and Applications** organized by IIT Hyderabad and DMRL Hyderabad on July 29, 2022.

PERSONAL INFORMATION

Date of birth : 10-07-1987
Sex : Male
Marital status : Married
Nationality : Indian
Language known : English, Hindi
Permanent adresse : Village: Pabhya, P.O. Tripuradevi, Berinag, Distt. Pithoragarh, Uttarakhand (India)-262531

REFERENCES

1. Prof. D.D. Sarma
Professor
SSCU, Indian Institute of Science
Bangalore-560012 (India)
e-mail: sarma.dd@gmail.com

2. Prof. E.V. Sampathkumaran
Professor,
Homi Bhabha Centre for Science Education,
Tata Institute of Fundamental Research,
Mumbai-400088 (India)
e-mail: sampathev@gmail.com

3. Dr. V. Raghavendra Reddy
Scientist-H,
UGC-DAE-Consortium for Scientific Research,
Indore (M.P.) 452001, India
e-mail: vrreddycsr73@gmail.com