

Dr. Abhinav Yadav

Ph.D. IIT (ISM) Dhanbad, Jharkhand, INDIA

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Full Name: Dr. Abhinav Yadav
Father's Name: Mr. Uma Shanker Yadav
Mother's Name: Mrs. Meena Yadav
Marital Status: Married
Date of Birth: 21/07/1990
Birth Place: Prayagraj, Uttar Pradesh, India
Current Position: Post-doctoral Associate at Materials Science & Engineering Department, Tuskegee University, AL, USA, 36088
Research Experience: Post-Doctoral Fellow at Southern Federal University, Russia, April 2021 to December 2022.



Educational Details:

Degree	Board/University	Year	Subjects	Division
High School	U. P. Board	2004	Science and Mathematics	First
Intermediate	U. P. Board	2006	Physics, Chemistry and Mathematics	First
Graduation	University of Allahabad, (Central University), Prayagraj, India	2010	Physics, Mathematics, Chemistry	Second
Post-Graduation	University of Allahabad, (Central University), Prayagraj, India	2012	Applied Physics	First
Ph. D.	Indian Institute of Technology (ISM) Dhanbad, Jharkhand, India	2021	Title: "STUDIES ON THE TEMPERATURE DEPENDENT DIELECTRIC PROPERTIES OF HOMO AND HETEROVALENT TRANSITION METAL SUBSTITUTED SODIUM NIOBATE ELECTROCERAMICS"	Awarded

Research Interest:

Synthesis of Nanoparticles, Ceramics, and Ceramic-Polymer Composites

- o Solid State Reaction, Solution Casting, and Ball Milling Synthesis
- o Structural, microstructure, thermal, mechanical, and chemical states Analysis
- o Dielectric, Ferroelectric, and Piezoelectric Analysis
- o Impedance Analysis, Magnetic Analysis

Research Publications:

(a) Publication in SCI Journals (During Post-Ph.D.)

1. **Abhinav Yadav**, S. Sahoo, S. Singh, I. P. Raevski, P. M. Sarun, "Influence of Mn-doping on the structure, high-temperature dielectric, and conductive properties of NaNbO₃ ceramics", *Materials Science and Engineering: B*, **297**, (2023), 116796.
2. S. Sahoo, **Abhinav Yadav**, K. P. Andryushin, P. K. Mahapatra, RNP Choudhary, "Systematic Investigations of structural transformation, dielectric and multiferroic properties of (Gd_{1-x}Ba_x)(Fe_{1-x}Ti_x)O₃ ceramics by tuning composition" "*Ceramics International*" **49**, (2023), 918-932.
3. I. G. Sheptun, V. G. Smotrakov, **Abhinav Yadav**, K. A. Chebyshev, Yu. A. Kuprina, S. I. Shevtsova, A. V. Nagaenko, V. P. Glazkov, E. V. Dyuzheva-Maltseva, N. V. Ter-Oganessian, "Solid state synthesis and dielectric properties of medium-entropy PbSc_{1/4}In_{1/4}Nb_{1/4}Ta_{1/4}O₃ ceramics and , assessment of the possibility of atomic ordering, *Materials Science and Engineering: B*, **229** (2023), 116454.
4. **Abhinav Yadav**, I. P. Raevski, P. M. Sarun, "Investigation on structural, dielectric, and impedance characteristics of Zr modified sodium niobate at elevated temperature", "*Materials Today Communications*" **33**, (2022),104712.
5. S. Sahoo, **Abhinav Yadav**, K. P. Andryushin, R N P Choudhary, "Influence of (0.19HfO₂-0.81ZrO₂) ceramics filler content on structural and dielectric properties of PVDF Polymer", *Synthetic Metals*, **287** (2022),117097.

(b) Book Chapter:

1. S. Sahoo, **Abhinav Yadav**, K.P. Andryushin, and L. A. Reznichenko, "Role and Prospects of Polymer based Nanomaterials in the Dielectric World." *Springer Publisher, Accepted.*

(c) **Publication in SCI Journals (During Ph.D.)**

1. **Abhinav Yadav**, S. P. Mantry, Mohd. Fahad, P. M. Sarun, "Temperature dependent dielectric relaxation and ac-conductivity of alkali niobate ceramics studied by impedance spectroscopy", *Physica B: Condensed Matter*, **537** (2018) 290-295.
2. **Abhinav Yadav**, Mohd. Fahad, S. Satapathy, P. M. Sarun, "Effect of tantalum on the temperature dependent electrical characteristics of $\text{NaNb}_{1-x}\text{Ta}_x\text{O}_3$ ($0.0 \leq x \leq 0.3$) ceramics between 400 and 560 °C", *Journal of Alloys and Compounds*, **797** (2019) 902-911.
3. **Abhinav Yadav**, M. Kumari, P. M. Sarun, "Influence of vanadium substitution on dielectric and electrical characteristics of NaNbO_3 ceramics in polymorphic R and S phase", *Materials Chemistry and Physics*, **264** (2021) 124424-124436.
4. **Abhinav Yadav**, Mohd. Fahad, P. M. Sarun, "Frequency dependent studies of dielectric and impedance properties of $\text{NaNb}_{0.92}\text{V}_{0.08}\text{O}_3$ ceramics", *Materials Today: Proceedings*, **46** (2021) 6286-6289.
5. S. P. Mantry, **Abhinav Yadav**, Mohd. Fahad, P. M. Sarun, "Effect of vanadium substitution on the dielectric and electrical conduction properties of SrTiO_3 ceramics", *Material Research Express*, **5** (2018) 036303.
6. S. Singh, **Abhinav Yadav**, M. Kumari, P. M. Sarun, "Analysis of giant dielectric permittivity and electrical properties for energy storage devices through impedance spectroscopy in $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ ", *Journal of Material Science: Materials in Electronics*, **33**, (2022), 9395–9402.
7. M. Kumari, **Abhinav Yadav**, P. M. Sarun, "Systematic Investigation of Structural, Optical and Dielectric Properties of 0.05 mol% Eu: BaTiO_3 Ceramics", *Materials Today: Proceedings* **46** (2021) 6102-6106.
8. S. Singh, **Abhinav Yadav**, M. Kumari, P. M. Sarun, "Frequency dependent study on dielectric, impedance and modulus behavior of bismuth vanadate ceramics", *Materials Today: Proceedings* **46** (2021) 6330-6334.

(d) **Conference Proceedings (During Ph.D.)**

1. **Abhinav Yadav**, Mohd. Fahad, S. P. Mantry, P. M. Sarun, "Investigation on the complex permittivity of transition metal ion doped sodium niobate ceramics between 313-373 K", *AIP Conference Proceedings* **2009**, 020018 (2018); [doi: 10.1063/1.5052087](https://doi.org/10.1063/1.5052087).
2. **Abhinav Yadav**, S. P. Mantry, P. M. Sarun, "Effect of Temperature and Frequency on the Studies of Structural and Dielectric Behavior of ABO_3 Type Orthorhombic Perovskite", *AIP Conference Proceedings* **2115**, 030595 (2019); <https://doi.org/10.1063/1.5113434>.
3. **Abhinav Yadav**, Mohd. Fahad, S. Singh, P. M. Sarun, "Frequency Dependent Dielectric, Impedance and Conductivity Studies of $\text{NaNb}_{0.75}\text{Zr}_{0.25}\text{O}_3$ Ceramic", *AIP Conference Proceedings* **2220**, 080024 (2020); <https://doi.org/10.1063/5.0001277>.
4. S. P. Mantry, **Abhinav Yadav**, Mohd. Fahad, P. M. Sarun, "Studies of Dielectric and electrical conductivity behavior of strontium titanate ceramic", *AIP Conference Proceedings* **2009**, 020011 (2018); [doi: 10.1063/1.5052080](https://doi.org/10.1063/1.5052080).
5. M. Kumari, **Abhinav Yadav**, S. Singh, P. M. Sarun, "Structural, Dielectric and Impedance Properties of $\text{BaTi}_{0.90}\text{Sn}_{0.10}\text{O}_3$ Ceramics", *AIP Conference Proceedings* **2220**, 080023 (2020); <https://doi.org/10.1063/5.0001281>.
6. S. Singh, **Abhinav Yadav**, M. Kumari, P. M. Sarun, "Frequency Dependent Dielectric and Impedance Behavior of Bismuth Vanadate Ceramics", *AIP Conference Proceedings* **2220**, 080047 (2020); <https://doi.org/10.1063/5.0001283>.
7. M. Kumari, S. P. Mantry, **Abhinav Yadav**, P. M. Sarun, "Investigation on Structural, Dielectric and Conduction Properties of $\text{BaTi}_{0.95}\text{Sn}_{0.05}\text{O}_3$ Ceramic", *AIP Conference Proceedings* **2244**, 050007 (2020); <https://doi.org/10.1063/5.0009354>.

(e) **Paper Presented in International and National Conferences (Oral/Poster)**

1. **Abhinav Yadav**, E. A. Bikyashev, S. P. Kubrin, N. V. Ter-Oganessian, I. P. Raevski, "Systematic investigation of dielectric characteristics of $\text{BaFe}_{1/2}\text{Sn}_{1/2}\text{O}_{3-\delta}$ ceramic" PHENMA-2021, **Southern Federal University, Russia (Oral Presentation)**.
2. **Abhinav Yadav**, Mohd. Fahad, S. Singh, P. M. Sarun, "Effect of Zr^{4+} ion on the structural and dielectric properties of NaNbO_3 Ceramics", Recent Trends in Devices, Circuits and Communication (RTDC²-2019), organized by Department of Electronics, Madan Mohan Malaviya University of Technology (MMMTU), Gorakhpur, 273010, Uttar Pradesh, India, 15-16th April 2019 (**Oral Presentation**).
3. **Abhinav Yadav**, S. P. Mantry, Mohd. Fahad, S. N. Singh, P. M. Sarun, "Frequency dependence dielectric and

modulus studies of alkali niobate ceramic”, National Conference On Advances In Spectroscopic Techniques And Materials (ASTM-2018), organized by Department of Applied Physics, IIT(ISM), Dhanbad, Jharkhand (India) 14-16 March, 2018.

4. **Abhinav Yadav**, S. P. Mantry, Mohd. Fahad, P. M. Sarun, “Structural and electrical properties of lead-free ABO_3 perovskite using complex impedance spectroscopy”, 2nd Meghnad Saha Memorial International Symposium-cum-Workshop on Laser Induced Breakdown Spectroscopy, (MMISLIBS-II 2018), organized by Department of Physics (UGC Centre of Advanced Studies), University of Allahabad, Allahabad (India) 19th-21st February, 2018.
5. **Abhinav Yadav**, P. M. Sarun, “Investigations on dielectric and impedance behavior of lead-free $NaNb_{0.95}Zr_{0.05}O_3$ ceramic”, National Conference on Recent Trends in Condensed Matter Physics (RTCMP-2017), organized by Bose Institute, Kolkata, WB (India), 31th October-3rd November, 2017.
6. **Abhinav Yadav**, T. Mondal, S. P. Mantry, P. M. Sarun, “Temperature dependence dielectric behavior of $NaNbO_3$ ceramics”, International Conference on Emerging Materials and Applications, An initiative for emergence of next generation technologies (ICEMA-2017), Organized by Physics Department, University of Allahabad, (India), 20th-22nd February, 2017.
7. **Abhinav Yadav**, T. Mondal, S. P. Mantry, P. M. Sarun, “Structural and dielectric properties of sodium niobate ceramic”, National Conference on Liquid Crystals (NCLC-2016), organized by Department of Applied Physics, IIT(ISM), Dhanbad, 07-09th December, 2016.
8. S. P. Mantry, **Abhinav Yadav**, Mohd. Fahad, P. M. Sarun, “Study of structural and dielectric behavior of strontium titanate ceramics”, Recent Advances in Materials for Sustainable Energy (RAMSE-2018), organized by Department of Applied Physics, IIT(ISM), Dhanbad (India), 03rd-05th March, 2018.
9. S. P. Mantry, **Abhinav Yadav**, Mohd. Fahad, P. M. Sarun, “Investigation of electrical conduction properties of strontium titanate ceramic using impedance spectroscopy”, 2nd Meghnad Saha Memorial International Symposium-cum-Workshop on Laser Induced Breakdown Spectroscopy, (MMISLIBS-II 2018), organized by Department of Physics (UGC Centre of Advanced Studies), University of Allahabad, (India) 19th-21st February, 2018.
10. Mohd. Fahad, **Abhinav Yadav**, P. M. Sarun, “Temperature dependent dielectric properties of $NaNb_{0.9}Ta_{0.1}O_3$ ceramic”, National Conference on Recent Trends in Condensed Matter Physics (RTCMP-2017), organized by Bose Institute, Kolkata, WB (India), 31st October-3rd November, 2017.
11. S. P. Mantry, **Abhinav Yadav**, P. M. Sarun, “Effect of temperature on the dielectric properties of strontium titanate ceramics”, National Conference on Recent Trends in Condensed Matter Physics (RTCMP-2017), organized by Bose Institute, Kolkata, WB (India), 31st Oct-3rd Nov, 2017.
12. S. P. Mantry, R. Agarwal, **Abhinav Yadav**, M. Fahad, P. M. Sarun, “Frequency and temperature dependent dielectric and electrical conductivity behavior of strontium titanate ceramics”, National Conference On Advances In Spectroscopic Techniques And Materials (ASTM-2018), organized by Department of Applied Physics, IIT(ISM), Dhanbad (India) 14-16th March, 2018.

(f) **Participation in International and National Conferences/Workshop**

1. “Second Science Conclave: A Congregation of Nobel Laureates” organized by Indian Institute of Information Technology, Allahabad during December 08-14th, 2009.
2. “Introductory Workshop on Optical & Infrared Astronomy (Sponsored by IUCAA, Pune)”, Organized by Department of Physics, DDU Gorakhpur University during October 26-29th 2010.
3. “International Topical Conference on Charged Particle Collisions and Electronic process in Atoms, Molecules and Materials (q-PaCE-2016) Organized by IIT (ISM), Dhanbad during January 09-11th 2016.
4. “Introduction to R and Data Analysis” Organized by IIT (ISM) Dhanbad during May 08-10th 2018.
5. “Two Day Workshop on Strengthening Carrier Prospects with Communication & Presentation Skills” organized by IIT (ISM) Dhanbad under the aegis of TEQIP-III, during October 19-20th 2019.

Awards and Achievements:

- ❖ Qualified National level Graduate Aptitude Test in Engineering (GATE) Examination-2015 with **Gate Score 382 and All India rank 1025**.
- ❖ Junior research fellowship (**JRF**) from Indian Institute of Technology (ISM), Dhanbad, Jharkhand, India, **September 2015-September 2017**.
- ❖ Senior research fellowship (**SRF**) from Indian Institute of Technology (ISM), Dhanbad, Jharkhand, India, **October 2017-September 2020**.
- ❖ Post-Doctoral Fellowship from Research Institute of Physics, Southern Federal University, Russia, **April 2021-December 2022**.

Skills and Responsibilities:

Experimental Techniques

- ✓ Synthesis of various multifunctional ceramics and polymers using solid state reaction, Nano-Agetator bead milling, Doctor Blade, 3-D printing, Solution casting and ball milling methods.
- ✓ Familiar with muffle furnace (programmed digital temperature controller) Eurotherm belongs to high temperature (1400 °C).
- ✓ Familiar with operating the XRD, FE-SEM, FTIR, RAMAN, TGA, DSC, P-E, LCR meter instruments.
- ✓ Familiar with analysis of XRD, FE-SEM, FTIR, RAMAN, TGA, DSC, P-E, dielectric data.
- ✓ Familiar with Rietveld refinement using *fullprof Suite* and GSAS-II software for XRD analysis
- ✓ Familiar with Vista Software for crystal structure analysis of the materials.
- ✓ Familiar with *X'pert high score* software for XRD and phase analysis.
- ✓ Familiar with *lattice calculator* software for calculating the lattice parameter.
- ✓ Familiar with *image j* software for measuring the size of grains.
- ✓ Familiar with *origin* software for plotting the various graphs.
- ✓ Familiar with EIS software, for Nyquist fitting.
- ✓ Familiar with C and C++ language in computer.
- ✓ Familiar with fundamentals of R-analysis in Matlab.
- ✓ Familiar with *Latex language* and properly do all the work in kile or texstudio.

Responsibilities

- ❖ Actively participated in all conferences, seminars and workshops organized by Department of Physics at IIT(ISM) Dhanbad from 2015 to 2021.
- ❖ Practical classes of B. Tech. student in 2015, 2016, 2017, 2018 sessions at IIT(ISM) Dhanbad.
- ❖ Theory classes of M. Sc. student from July 2018 to April 2019 session at IIT(ISM) Dhanbad.
- ❖ Exam duties of B. Tech. and M. Sc. students in 2015, 2016, 2017, 2018, 2019 at IIT(ISM) Dhanbad.

Declaration:

I hereby declare that the information in the bio-data (CV) is true best of my knowledge and belief.

Date: February 16th 2024

Abhinav yadav

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