

Dr. Uma S

Contact Information

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Objective

To work in a challenging environment that utilizes my effective research knowledge and accomplishments in order to build a literate mass and groom them to higher standards. With my abilities and skills, I aspire to contribute to the organization to my level best for the growth of the organization and self.

Education

- Bachelor of Science (2000-2003) Physics.
Mahatma Gandhi University, Kerala, India.
First class (with an aggregate of 85)
- Master of Science (2003 - 2005) Physics.
Mahatma Gandhi University, Kerala, India.
Distinction (with an aggregate of 80) Main Project: Development of a low-cost lock-in-amplifier.
- Bachelor of Education (2005-2006) Physical Science.
Mahatma Gandhi University, Kerala, India.
First class (with an aggregate of 71.3)
- Ph.D. in Faculty of Technology- Submitted (November 2007- December 2013).
Topic: Thermal, dielectric, pyroelectric and related properties of selected nanocrystalline multiferroics and polymer ceramic nanocomposites.
Department of Instrumentation, CUSAT, Cochin-682022, Kerala, India.

Research Experiences

- Temperature dependent experiments using Photopyroelectric (PPE) technique.
- Low Temperature measurements down to Liquid Nitrogen temperature for phase transition studies.
- Magnetic field dependent PPE measurements.
- Experiments using Photoacoustic (PA) technique.
- Thermal characterization of nanofluids using PA technique.
- Investigating room temperature as well as temperature dependent dielectric properties of ceramics and composites.
- Development of a pyroelectric cell for pyroelectric coefficient determination.

- Preparation of ceramic nanopowders using hydrothermal synthesis.
- Development of thick film nanocomposites for IR sensing application.

Teaching Experiences

- Aug 2006 – Dec 2006: Guest Lecturer for B.Tech Instrumentation, Dept. of Instrumentation, Cochin University of Science and Technology, Kalamassery, Cochin-22.
- Jan 2014 – April 2014: Guest Lecturer for B. C. A (Digital Electronics), KMEA College of Arts and Science, Edathala, Aluva.
- Jan 2014 – April 2014: Guest Lecturer for B.Tech (Engineering Physics), KMEA College of Engineering, Edathala, Aluva.

Awards

- Young Scientist Award of the Kerala State Council for Science, technology, and Environment in the subject area Physical Science based on the presentation of the paper entitled Magneto-thermal conduction in nanocrystalline multiferroic bismuth ferrite.
- Qualified the State Eligibility Test- May 2007 in physics presented as one of the qualification for appointment as Higher Secondary School Teacher.
- Cash award from St. Paul's college, Kalamassery for being the topper in M.sc Physics.
- Awarded the proficiency certificate from St. Paul's College, Kalamssery for proficiency in studies in M.Sc. physics class during the academic year 2004-2005.

Fellowships

- Junior Research Fellowship from Cochin University of Science and Technology (2007-2009).
- Senior Research Fellowship from Cochin University of Science and Technology (2009-2011).

Skills and Experiences

- Gained experience in the development of photoacoustic and photopyroelectric measurement set up.
- Gained experience in the development of measurement set up for electrical characterization.
- Experience in performing thermal characterization measurements on pellets, crystals, thick films, and composites.
- Experience in carrying out low temperature photopyroelectric spectroscopy and dielectric spectroscopy.
- Experience in preparation of nanopowders employing hydrothermal synthesis and ball milling.
- Experience in preparation of ceramics using the solid-state method.
- Interpreting results of analytical characterization tools.
- Experience in using instruments like LCRmeter, Impedance analyzer, Lock-in, Picoammeter.
- Experience in developing large area sensors using polymer nanocomposites for IR sensing applications.

- Attended workshops on material characterization at nanoscales and instrumental methods of analysis.
- Experience in writing research articles and orally presenting at national conferences.

Area of Expertise/Interest

Photoacoustics and photothermal techniques, Electrical studies – Dielectric spectroscopy and pyroelectric coefficient determination, Nano-scale heat transport, Heat transport mechanism in multiferroics, Nanoceramics, Nanocomposites, etc.

Research Publications

1. Induction of electro-activity in polyvinyl alcohol with the addition of nanocrystalline PZT ceramic, *Ind J of Pure and Appl Phys* 51, 717 (2013), S. Uma and J. Philip.
2. Magneto-thermal conduction and phonon anomalies across magnetic transitions in multiferroic (poly and nanocrystalline) Bismuth ferrite, *Physica B: Condensed Matter*, 437, 10 (2014), S. Uma and J. Philip.
3. Magneto-thermal conduction and magneto-caloric effect in poly and nanocrystalline forms of multiferroic GdCrO₃, *Physica Scripta*, (under review), S. Uma and J. Philip.
4. Magneto-thermal conduction in micro and nanostructured Gadolinium nitride, *Indian journal of physics*, (under review), S. Uma, S.P. Sanyal, and J. Philip.
5. Enhancement in pyroelectric properties of PZT-PVA polymer nanocomposites with the addition of PAA, *Journal of Applied Polymer science*, (under review), S. Uma and J. Philip.
6. Preparation, characterization and properties of Sm₂Si₂O₇ loaded polymer composites for microelectronic applications”, *Materials Science and Engineering: B* 163 (2009) 67, Sherin Thomas, V. Deepu, S. Uma, P. Mohanan, J. Philip, and M.T. Sebastian.
7. Dielectric, mechanical, and thermal properties of low permittivity polymer-ceramic composites for microelectronic applications”, *International Journal of Applied Ceramic Technology*, 7 (2010) 461, S. George, P. S. Anjana, J. Krupka, S. Uma J. Philip, and M. T. Sebastian.
8. Dielectric, thermal, and Mechanical Properties of CeO₂-Filled HDPE Composites for Microwave Substrate Applications”, *Journal of Polymer Science Part B: Polymer Physics*, 48 (2010) 998, P. S. Anjana, V. Deepu, S. Uma, P. Mohanan, J. Philip, M. T. Sebastian.
9. Thermal Properties of Low Loss PTFE-CeO₂ Dielectric Ceramic Composites 118 (2010) 751, P. S. Anjana, S. Uma, J. Philip, and M. T. Sebastian.
10. Mechanical, thermal and laser-induced surface damage analysis of II Group metal complexes of Thiourea”, *Materials Chemistry and Physics* 126 (2011) 463, S. Dhanuskodi, T.C. Sabari Girisun, G. Bagavanarayana, S. Uma, and J. Phillip.
11. Dielectric, thermal, and mechanical properties of Sr₂ZnSi₂O₇ based polymer/ceramic composites”, *Journal of Materials Science: Materials in Electronics*, 23(2012) 1243, T. Joseph, S. Uma, J. Philip, and M. T. Sebastian.

Conferences

1. Synthesis, characterization and dielectric measurements on nanocomposites of PVA-PZT, International Conference on Nanoscience and Nanotechnology, Tiruchengode, Tamilnadu (December 2010).
2. Pyroelectric and thermal properties of PZT-PVA nanocomposites, DAE Symposium on Solid State Physics, Manipal (December 2010).
3. Thermal properties of poly and nanocrystalline forms of multiferroic Bismuth Ferrite across magnetic transitions, 24th Kerala science Congress (2011).
4. Photoacoustic measurement of the thermal diffusivity of PVA dispersed with Au nanoparticles, 16th National symposium on Ultrasonics, Sophisticated test and instrumentation center, Cochin University of Science and Technology (2007).
5. Thermal diffusion in natural rubber dispersed with ZnO nanoparticles”, MATCON, Cochin University of Science and Technology (2009).
6. Photopyroelectric measurement of thermal conduction in HDPE-CeO₂ composites”, 15th International Conference on Photoacoustic and Photothermal Phenomena, 2009, July 19-23, Leuven, Belgium.

Languages

- English - Fluent in reading, writing, speaking, and understanding.
- Malayalam - Mother tongue.

Personal Details

Date of Birth: 29-MAY-1983
Place of Birth: Parur (Ernakulam, Kerala, India)
Gender: Female
Nationality: Indian
Marital Status: Married

References

1. Prof. (Dr.) Jacob Philip
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2. Dr. Rajeev Kumar
Assistant Professor, Department of Instrumentation
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3. Dr. K.N. Madhusoodanan
Assoc. Professor, Department of Instrumentation
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