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Department of Physics, Smart Nano Materials Research Laboratory
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EDUCATION

PhD Physics Department, Worcester Polytechnic Institute, Worcester, MA, USA 2010-2013

Thesis: "A Study of Thermal Physical Properties of Nano composites of Complex fluids"

Advisor: **Professor Germano S. Iannacchione**

MS Physics Department, Worcester Polytechnic Institute, Worcester, MA, USA 2010-2013

Thesis: "A Study of Thermal Physical Properties of Nano composites of Liquid Crystals"

Advisor: **Professor Germano S. Iannacchione**

M.Sc., Physics Department, University Of Hyderabad, Hyderabad, India 2000-2002

Thesis: "A Study of Solutions of The potential Problems in 1-D for Bound States"

Advisor: **Professor A. K. Kapoor**

Google Scholar:

https://scholar.google.com/citations?hl=en&user=QMwDMiIAAAAJ&view_op=list_works&sortby=pubdate

Research Experience

1. Post-Doctoral Research Fellow (2013-2015)

Carnegie Mellon University, Pittsburgh, PA, USA

Projects: "A Study of Thermal and Mechanical Properties of Polymer Nano composites"

Principle Investigator: **Prof. Mohammad Islam**

2. Post-Doctoral Research Fellow (2015-2016)

King Abdullah University Science and Technology, KSA

Projects: 1) *"A Study of Oil induced Spontaneous Flows in surfactants" and electro-spun fibers*

2) *"Mechanical Properties of Silver Coated Electro-Spun Scaffolds for Antibacterial Activity"*

Principle Investigator: **Prof. Sahraoui Chaieb**

3. Post-Doctoral Research Fellow (Aug 2015-Dec 2015)

Indian Institute of Science, Bangalore, KA, India

Project: *"A Study of Optical properties of Al₂O₃/CdSe Meta-materials"*

Principle Investigator: **Prof. Jaydeep Basu**

4. Faculty Internship Program (July 2022-Sep 2022)

International Advanced Research Center for New Materials (ARCI), Hyderabad, India

Project: *"A Study of Carbon Based Thermoelectric Devices"*

Principle Investigator: **Dr.P.K.Jain Scientist -G**

Professional Experience

1. Assistant Professor (2016 to till date)

Department of Physics, Government City PG College, Osmania University, Hyderabad

Responsibilities

- Developing curriculum for PG and UG students
- Guiding PhD students and making them to achieve their goals
- Conducting and proposing research projects
- Teaching PG (MSc Physics) and UG (BSc) courses
- Participating and conducting national and international conferences
- Participating in faculty development programs, and orientation programs
- Designing new courses and students research projects for PG and UG students

2. Teaching Assistant (2010-2013)

Worcester Polytechnic Institute, MA, USA

- Working on research projects
- Teaching UG courses
- Conducting UG labs
- Guiding and helping for UG research projects

3. Lecturer (2002 to 2010)

Government Colleges, Telangana, India

Responsibilities

- Developing and designing course work and lab work
- Participating faculty orientation programs

AWARDS

1. Jignasa Students Study Projects - State Award 2022; 2023
2. Research Award- 2022
3. **State Level Best Teacher** (Faculty) Award from Telangana State, India (2019)
4. Summer Faculty Internship at International Advanced Research Center for New Materials (2022)
5. Summer PhD student Internship at **Liquid Crystal Institute, Ohio, USA** –(April 2011 to Aug 2011)
6. **Teaching assistantship (TA) to pursue PhD at WPI, MA, USA** (2010-2013)
7. Summer MSc students Internship at Bose Institute, Calcutta, India –(April 2001 to June 2001)
8. Merit scholarship during MSc in University of Hyderabad (2000-2002)
9. 2nd Rank in Physics Lecturer recruitment conducted by Andhra Pradesh government-2003

Research Projects

1. Carbon based thermoelectric materials for thermo electric generators(SERB-SURE Grant)
2. Micro-fibrous Silver-coated Polymeric Scaffolds with Tunable Mechanical Properties"(KAUST grant)
3. Tunable Multi-Functional Properties of Conducting Polymer Nano-composites for Foldable Biomedical and Electronic Device's Applications".(SERB special grant-under review)
4. Spontaneous flow of AOT and Octane oil (BC-Grant)-2018
5. **Green Synthesis of Nanoparticles (RUSA, CCE Grant)-2020**
6. **Synthesis and Characteristics of Bayer nanotubes (NSF grant-CMU, USA)-2014**

Reviewer

1. **Materials Letters (Elsevier)**
2. **Nanomaterial's and Nanotechnology (SAGE)**
3. **Journal polymer research (Springer)**
4. **Composite Part-B (Elsevier)**
5. **Journal of Applied Polymer Science (Wiley)**
6. **Nanotechnology, Science and Applications (Dove press)**
7. **Polymer Engineering and Science (Wiley)**
8. **Molecules (MDPI)**
9. **Material Today (Elsevier)**
10. **Applied Surface**
11. **Polymer (MDPI)**

Guest Editor

Journal of Nanomaterial and Nanotechnology – (SAGE)

- Special Collection Journal paper in the area of nanomaterial's

Editorial Board Member

- Journal of Composites and Biodegradable Polymers (Korean)
- Journal of Results in Materials –**Elsevier**

Membership with Professional and Scientific bodies

1. Life member of Material Research Society (MRS)
2. Life member of American Physics Society (APS)
3. Member of Telangana Academy of Science
4. Member of Carbon material Society of India
5. Member of Telangan School Development Forum
6. Life Member of Indian Carbon Society-CSIR
7. Indian carbon Society-CSIR

Academic Administrative positions

1. In-charge Head, Department of Physics, GDC (2020-2021)
2. Member for Internal Quality Assurance Cell (IQAC) (2020-2021)
3. NCC in-charge 1(T) army unit (2017-2019)
4. Jignasa Coordinator (2021-2022)
5. Coordinator for admission committee (2021-22)
6. Member in Institution Innovation committee (2021-2022)

Invited Talks/Seminars/FDPs/RC/OC/Extension Lectures/Workshops/Symposiums

1. One day Symposium on Spintronics and Memristor Devices, Organized by **Dept . of Physics, IITH, 8th Jan 2024 -National**
2. Symposium on Self Reliance on Electronics; Organized by **Dept** of Physics, University of Hyderabad, 16-17 Feb 2023-National
3. Green Technology -Antibacterial Applications; Organized by **Engineering Staff College of India, Hyderabad 2023-International**
4. **Nano 2022-World Congress on Nanotechnology- Italy, Europe; 11/12/2022-International**
5. “Tunable mechanical properties of multiwalled carbon nanotubes/thermoplastic polyurethane nanocomposites” **5th International -Biomaterials and Nanomaterials; London; UK; March 10, 2022-International**

6. Two Day National Conference on Recent Innovatives in Smart Nano Materials; Department of Physics, **University College of Science, Osmania University, Hyderabad-500007** 29th to 30th **April 2022.**
7. Two day International Conference on “Advances in Smart NanoMaterials organized by Department of Physics, Govt. City College(A), Hyderabad o- **GCC Nayapul, Hyderabad; 24th & 25th March 2022.**
8. One day International Webinar on Recent trends Optoelectronics and Devices; **GDC Hayathnagar, 19-12-2020-International**
9. Faculty Internship on **Carbon nanomaterial’s at ARCI, Balapur, India-National**
10. National Science Exhibition- **organized by Dept. of Physics, GCC, TS; 2/28/2023**
11. A Facile Synthesis of Silver Nanoparticles Using Terminalia Chebula Fruit Extract and Their Antibacterial & Dye Degradation Activity with Muci-Water-**Jignasa State level 2023, TS.**
12. National Intellectual Property Awareness Mission; organized by **GCC, Nayapul 2023, TS**
13. Turbulent Flow in Oil Induced Fluids; **GDC HYT, March 2021**
14. Extension Lecture on Nano Science in Daily Life at **GDC Chanchal guda, Hyderabad, TS (July 2022)**
15. Extension Lecture on Nanomaterials and nanotechnology **at SRNK Degree college, Bansuwada , Kama Reddy, Telangana (Feb 2022)**
16. Extension Lecture on Nanomaterials and nanotechnology **at GDC Hayathnagar, Ranga Reddy, Telangana (Feb 2023)**
17. Extension Lecture on Nanomaterials and nanotechnology **at ARCI, Hyderabad May 2023** “Thermoelectric Performance of Single Walled Nanotube-Filled Polymer Composites” – **IISER Kolkata, India (May 2014)**
18. “Thermal and Mechanical Properties of Polymer Nano-Composites” – **University of Hyderabad, Hyderabad, India (May 2014)**
19. “Thermoelectric Performance of Single Walled Nanotube-Filled Conductive Polymer Composites” – **IIT Hyderabad, India (May 2014)**

Invitation:

1. Judge for State level Inspire Science Fair at Yamjal, KB School, Hyderabad (2019)
2. Jury Member for Ranga Reddy District Level Inspire Science Fair 2020 (Virtual mode)

Refresher Courses/FDPs/OC:

1. Online faculty Induction Program from 2-11-2020 to 1-12-2020 UGC-HRDC, Osmania University
2. A brief course on Superconductivity in January-February 2022 (4-weeks)
3. Elite NPTEL Online Certificate Course (Swayam)
4. FDP for Physics faculty at UG Level, Mahathma Gandhi University, Nallagonda
5. July 26th – 30th 2022.
6. Refresher Course in Materials Science from 1st – 16th of September 2023 UGC-Malaviya Mission Training Centre, Osmania University.
7. Online Course on Nano Photonics, Plasmonics and Meta materials from July-to-October 2023 (12-Months), NPTEL (Swayam)
8. Online Faculty Development Program on eSim from IIT Mumbai Spoken Tutorial;

SUMMARY OF RESEARCH

- Study of Green synthesis of **Mono/Bi/Tri metal Nanoparticles for antibacterial Applications**
- Study of Green synthesis of **Mono/Bi/Tri metal Nanoparticles for Photo-catalytic Applications**
- Study of **Hydrogen energy and Activated carbon using waste plastics and Coconut shells;**
- **Metal polymer based film for Antibacterial applications using Biosynthesis**
- Thermal and mechanical properties of nanotubes of aerogel based 3D scaffolds
- **Thermoelectric properties of Green synthesized metal/Graphene Nanocomposites**
- **Spintronics and Energy storage Applications of Fe-Ni/Co/Graphene based Nanocomposite materials-Biosynthesis approach**
- Study of thermal and mechanical properties of **polymer Nano composites of based 3D scaffolds**
- Study of Thermal and Viscoelastic properties of **polymer Nano composites of aerogels**
- Study of **Carbon based Hydrogel/Aerogels** thermoelectric materials and their conducting polymer Nano composites scaffolds aerogels.
- Study of **oils induced spontaneous flows in surfactants** (AOT, Octane, Nonane, Decane)
- Study of optical properties of **Al₂O₃/CdSe meta-materials**
- Synthesis and characterization of **silver nanowires for flexible electrodes**
- Synthesis and optical properties of **quantum dots, gold and silver nanoparticles**
- Study of **thermal, electrical and optical properties of polymer Nano composites Thin films**
- Micro-fibrous Silver-coated **Polymeric Scaffolds with Tunable Mechanical Properties**
- Study of thermal physical properties of liquid crystal Nano composites
- Leadership, managerial and research experience in various liquid crystals, polymers, semi crystalline polymers, **CNTs hydrogels/aerogels, Graphene oxide, Quantum dots (CdS), nanowires, micro-fluids, meta-materials.**
- Great ability to manage multiple projects and prioritize based on deadlines and ability to work in a fast paced environment with great attention.
- Excellent interpersonal skills, effective oral and written communication skills

PUBLICATIONS

- 1) **Kalakonda, P., Mandal, P., Laxmi Mynepally, S. et al.** Comparison of Multi-metallic Nanoparticles-Alternative Antibacterial Agent: Understanding the Role of Their Antibacterial Properties. **Journal of Inorganic and Organometallic Polymer and Materials -Springer Nature (2024)** <https://doi.org/10.1007/s10904-023-02960-x>
- 2) P.Kalakonda et.al., Sustainable Cu-Ag-Bimetallic Nanoparticles for Improved Photocatalysis Applications, Submitted to-**Journal of Material Science and Engineering B-Elsevier**, 301 **117147 (2024)**
- 3) **P. Kalakonda, M. Islam,** " Improved Thermoelectric Performance of Single Walled Nanotube-Filled Polymer Composites with Poly (3, 4-ethylenedioxythiophene) Poly (styrenesulfonate) " (**Journal Physical Chemistry-Under Review –RSC Advance (2024)**).
- 4) **P. Kalakonda et.al.,** Eco-Friendly Fabrication of Silver Nanoparticles for Sustainable Water Purification and Antibacterial Synergy, Under Review –**Plasmonics-Springer Nature (2024)**
- 5) P. Kalakonda, S.Chaieb, "Study and Characterization of Oil Induced Spontaneous Flow in Water- Bis(2-ethylhexyl)Sulfosuccinat (AOT) system -(**Physics of Fluids-2024**)
- 6) **P. Kalakonda et.al.,** Facile Synthesis of Silver Nanoparticles using Green Tea Leaf extract and Evolution of Antibacterial activity - **Plasmonic-Springer Nature, 18**, 1837-1845, (**2023**)
- 7) **P. Kalakonda et.al.,** Green Synthesis and Characteristics of Silver Nanoparticles using *Argyrea Nervosa* Leaf Extracts, and Their Antimicrobial Activity –**Plasmonic-Springer Nature, 18(3)**,1075-1081, (**2023**)
- 8) **P. Kalakonda et.al.,** Bio-mimetic of Synthesis of Copper Nanoparticles using *Tinospora Cordifolia* plant leaf extract for Photo-catalytic Activity applications-**Plasmonic Springer Nature, 18 (5)**, 1050-1057, (**2023**)
- 9) **P. Kalakonda et.al.,** Micro-fibrous Polymeric Composite with Tunable Mechanical Properties for Antibacterial Applications- **Journal of Nanoparticle Research-Springer Nature; 25 (250)** (**2023**)

- 10) **P. Kalakonda**, S.Banne, P.B.Kalakonda, "Study of mechanical anisotropy of single walled carbon nanotube and polyvinyle alcohol polymer nanocomposite with a controlled alignment process" **Journal of Polymer Research, Springer nature**, **29**,442 (2022).
- 11) **P. Kalakonda**, P.B.Kalakonda,S Banne, "Studies of Electrical, Thermal and Mechanical Properties of Single walled Carbon Nanotube and Polyaniline of Nanoporous Nanocomposites" , **Nanomaterials and Nanotechnology**, **11**, 18479804211001140, (2021)
- 12) **MR Tchalala**, JK El-Demellawi, P. Kalakonda, S. Chaieb "High thermally stable hybrid materials based on amorphous porous silicon nanoparticles and imidazolium-based ionic liquids: Structural and chemical analysis " **Materials Today: 39, J. Mat. Pr.10.106** (2020)
- 13) **P.Kalakonda**,S.Banne, P.B. Kalakonda, " Enhanced mechanical properties of multiwalled carbon nanotubes/thermoplastic polyurethane " **Nanomaterials and Nanotechnology**, **9:1-7** (2019)
- 14) **P. Kalakonda**, **S. Banne**, "Synthesis and Optical Properties of Highly Stabilized Peptide-Coated Silver Nanoparticles", **Plasmonics**, **13(4)**, 1265 (2018)- **Springer nature**
- 15) **P. Kalakonda**, MA Aldahri, mS Abdel-Wahab, A Tamayol, KM Moghaddam, FB Rached, A Pain, A Khademhosseini, A Memic, S, Chaieb "Microfibrous Silver-coated Polymeric Scaffolds with Tunable Mechanical Properties" **RSC Advances**, **7(55)**, 34331 (2017)
- 16) **P. Kalakonda** , S Banne, "Thermo-Mechanical Properties of PMMA and Modified SWCNT Composites" **Nanotechnology, Science and Application**, **10** ,45 (2017)
- 17) **P. Kalakonda** , S.Banne, "Synthesis and Optical Properties of Highly Stabilized Peptide-Coated Gold Nanoparticles" **Plasmonics**, **12 (4)**, 1221, (2017)- **Springer nature**
- 18) **P. Kalakonda**, "Synthesis of Silver Nanowires Conductive and Transparent Film" **Nanomaterials and Nanotechnology**, **6**, 1847980416663672 (2016)
- 19) **P. Kalakonda**, Y Cabrera, R Judith, GY Georgiev, P Cebe, G S Iannacchione , "Study of Electrical and Thermal Conductivities of Sheared Multi-walled Nanotube with Isotactic Polypropylene Polymer Composites " **Nanomaterial and Nanotechnology**, **5(2)**, 5772 (2015).
- 20) **P. Kalakonda**, G S Iannacchione, "Calorimetric Study of Phase Transitions in Nanocomposites of Quantum Dots and a Liquid Crystal", **Phase transition.**, **88(2)** (2015)

- 21) **P. Kalakonda**, R Basu, IR Nemitz, C Rosenblatt, G S Iannacchione, "Studies of Nanocomposites of Carbon Nanotubes and a Negative Dielectric Anisotropy Liquid Crystal", *J. Chem. Phys.*, **140**,104908 (2014).
- 22) **P. Kalakonda**, G S Iannacchione, "Calorimetric and dielectric study of a negative dielectric anisotropy alkoxy- phenyl-benzoate liquid crystal", *J Pure & Appl. Phy.*, **52**, 689-698 (2015)
- 23) **P. Kalakonda**, Y Cabrera, R Judith, GY Georgiev, P Cebe, G S Iannacchione, "Calorimetric study of nanocomposites of multi-walled carbon nanotube and isotactic polypropylene polymer", *J. Appl. Polym. Sci.*, **130** (1), 587-594 (2013).
- 24) **P. Kalakonda**, Y Cabrera, R Judith, GY Georgiev, P Cebe, G S Iannacchione, "Thermal and Electrical Transport Properties of Sheared and Un-Sheared Thin-Film Polymer/CNTs Nanocomposites, *MRS Advances*, **1660**,25-30 (2014) –Springer Nature.
- 25) **P. Kalakonda** , A.Casy Y Cabera, R Judith, GY Georgiev, P Cebe, G S Iannacchione, "Cellular Automata Simulations of Thermal Transport Properties of Thin- Film Polymer/CNTs Nano-Composites for Improved Design", *MRS Advances*, **1619**,6 (2013) –Springer Nature
- 26) **P. Kalakonda**, M.Daly, K Xu, Y Cabrera, R Judith, GY Georgiev, P Cebe, G S Iannacchione, "Structure-Electrical Transport Property Relationship of Anisotropic iPP/CNT Films, *MRS Advances*, **1499**,583 (2013) –Springer Nature
- 27) **P. Kalakonda**, E.A.Gombos, GY Georgiev, P Cebe, G S Iannacchione , "Thermal Transport Properties of Melt-Shear Oriented iPP/Carbon Nanotube Thin Films, *MRS Advances*, **1410**, 13-18(2012) –Springer Nature
- 28) **P. Kalakonda**, E.A.Gombos, G.S.Hoonjan, GY Georgiev, P Cebe, G S Iannacchione, "Electrical Conductivity of Anisotropic iPP Carbon Nanotube Thin Films" *MRS Advances*, **1410**, 37-42(2012) –Springer Nature
- 29) S. Sarkar, **P. Kalakonda**, GY Georgiev, P Cebe, G S Iannacchione, "Optical Transport Properties of Oriented Isotactic Polypropylene and Carbon Nanotube Nanocomposite Thin Films, *MRS Advances*, **1410**, 49-54(2012) –Springer Nature

- 30) **P. Kalakonda**, S.Sarkar, E.A.Gombos, GY Georgiev, P Cebe, G S Iannacchione, "iPP/CNTs Multifunctional Polymer Nanocomposite" **MRS Advances**, **1403**, 91-96(2012) –Springer Nature
- 31) **P. Kalakonda**, G S Iannacchione, "Effect of protein (Myoglobin) on the isotropic to nematic phase transitions", APS March Meeting Abstracts 1, 1179.
- 32) **P. Kalakonda**, G S Iannacchione , "Effect of quantum dots on the isotropic to nematic and nematic to smectic- A phase transitions in nano composites", APS Meeting Abstracts 1, 28011
- 33) **S. Sarkar, P. Kalakonda**, G S Iannacchione , "Optical characterization of isotactic polypropylene and carbon nanotube composites using spectroscopic ellipsometry", APS Meeting Abstracts 1, 32004
- 34) **P. Kalakonda**, G S Iannacchione , "Macroscopic Ordering of CNTs in a Liquid Crystalline Polymer Nano- Composite by Shearing", APS March Meeting Abstracts 1, 1195.
- 35) **P. Kalakonda**, G S Iannacchione , "Effect of CNTs and Induced Chirality on Smectic - Smectic Liquid Crystal Phase Transitions", APS Meeting Abstracts 1, 44008
- 36) **P. Kalakonda**, S.Chaieb, "Oil Induced Spontaneous Flow in Water-Bis (2-ethylhexyl) Sulfosuccinat (AOT) system", abstract #A53.001 (2016)

Book Chapters and Patents Published

Indian Patent Application: Application No: 202341028901

1. P.Kalakonda, G S Iannacchione, Carbon Nanotubes - recent progress, SBN:978-1-78923-052-9.
2. P.Kalakonda, S Banne, Silver Nanoparticles , Fabrication and Characterization, SBN:978-1-78923-478-7 (Intech open)
3. P.Kalakonda, S Banne, Gold Nanoparticles,SBN:958-1-78923-468-8 (Intech open)
4. P.Kalakonda, Physics of Nanomaterials, 2021,Dr.B.R.Ambedkar open University, Hyderabad, India.

CONFERENCE PRESENTATIONS

- **P. Kalakonda** et al. 46th New England Complex Fluids Workshop, **[Oral] (Harvard University, 2010)**“Macroscopic Ordering of CNT in a Liquid Crystalline Polymer Nano-Composite by Shearing”.
- **P. Kalakonda** et al. 49th New England Complex Fluids Workshop, “Electrical and thermal Transport Properties of Polymer Nano Composites”, **[Oral] (Harvard University 2011)**.
- **P. Kalakonda** et al. Electrical transport properties Of Polymer Nano Composites, **[Oral] at Fall MRS (2011)**.
- **P. Kalakonda** et al. Thermal transport properties Of Polymer Nano Composites, **[Poster] at Fall MRS (2011)**.
- **P. Kalakonda** et al. Multifunctional transport properties Of Polymer Nano Composites, **[Poster] at Fall MRS (2011)**.
- **P. Kalakonda** et al. Optical transport properties Of Polymer Nano Composites, **[Poster] at Fall MRS (2011)**.
- **P. Kalakonda** et al. Effect of CNTs and Induced Chirality on Isotropic to Nematic and Nematic to SmecticA Liquid crystal phase transitions, **[Oral], Bulletin of the American Physical Society (2012)**.
- **P. Kalakonda** et al. Macroscopic ordering of CNTs in a Liquid Crystalline Polymer Nano-composite by shearing, **[Oral], Bulletin of the American Physical Society (2012)**.
- **P. Kalakonda** et al. Macroscopic Ordering of CNT in a Liquid Crystalline Polymer Nano-Composite, **[Poster] (Worcester, MA, 2011), Bull. Grad WPI (2011)**.
- **P. Kalakonda** et al. 50th New England Complex Fluids Workshop, Evaluation of I-N and N-A Phase transition in Liquid Crystal 90O4 and MWCNTs mixtures **[Oral] (Yale University, 2012)**.
- **P. Kalakonda** et al. Effect of CNT and Induced Chirality on I-N and N-A Liquid Crystal Phase Transitions, **[Poster] , 2nd Annual Nano Worcester Symposium, Worcester, WPI. March (2012)**.
- **P. Kalakonda** et al. Evaluation of I-N and N-A Phase transition in Liquid Crystal 90O4 and MWCNTs mixtures, **[Poster], Worcester, WPI. March 29, Bull. Grad WPI (2012)**.

- **P. Kalakonda** et al. 54th New England Complex Fluids Workshop, "Effect of quantum dots on the isotropic to nematic and nematic to smectic-A phase transitions in nano composites", [**Oral**] (**Harvard University, 2013**)
- **P. Kalakonda** et al. Structure-Electrical Transport property relationship of Anisotropy iPP/CNT films, [**Poster**], **Sukant Tripathy Annual Memorial Symposium (2012)**.

TECHNICAL EXPERTIES OF INSTRUMENTATION

1. Systematic design and layout : Techniques for synthesis of nanomaterial's

- Synthesis of carbon nanotube hydrogel or aerogel
- Synthesis of liquid crystal and polymer nanocomposites
- Synthesis of ultra -long silver nanowires
- Synthesis of quantum dots with different sizes
- Synthesis of metal nanoparticles with well controlled size by chemical, sol gel and green synthesis
- Synthesis of liquid crystal Nano composites and Synthesis of PANI polymer

2. Device characterization:

- Universal testing machines (Instron 5940 series)
- Dynamic mechanical analysis (RSA-G2 DMA instrument)
- Thermal analysis (AC Calorimetry, DSC, MDSC and TGA)
- J.A.Wollam Ellipsometry for optical characterization,
- X-ray diffraction analysis-Powder XRD (BRUKER AXS)
- Surface and morphology studies (Optical microscope, SEM,TEM and AFM)
- Analysis of optical properties :UV/VIS Spectrophotometer (SHIMADZU, Varian Cary) and FTIR and Raman Spectrometry
- ICP-OES for elemental analysis
- Zeta potential for charge/size distribution analysis
- Electrical measurement : 4-point probe station (Keithley)
- **Developed setups for electrical and thermal conductivity measurements**
- Engineering Analysis Tools: MS office, MATLAB; Data acquisition: Lab VIEW

COMPUTATIONAL METHODS

- Finite difference time domain (FDTD) simulation for study of density of states in wire meta-materials
- COMSOLE MULTI-PHYSICS SIMULATION

REFERENCES:

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