

C Chandraprakash

CONTACT INFORMATION	211, Northern Laboratories I Department of Mechanical Engineering Indian Institute of Technology Kanpur Website: https://chandraprakashster.wixsite.com/chan	Voice: 0512-259-6743 E-mail: chindamc@iitk.ac.in Fax: 0512-259-7408
RESEARCH INTERESTS	Instrumentation: Computer vision, soft robots. Metamaterials: Acoustic metamaterials, sound absorption, biomimetic design Non-destructive evaluation: Thermography, ultrasonics, soft robots, computer vision Multifunctional biodegradable materials for electromagnetic, acoustic, and thermal insulation. My approach is holistic. I apply numerical techniques, build mathematical models, and perform experiments towards building products.	
EDUCATION	Doctor of Philosophy in Engineering Science and Mechanics Pennsylvania State University, University Park, PA, USA Aug 2011 - Feb 2017 <ul style="list-style-type: none">• Dissertation: Multifunctional Parylene-C microfibrinous thin films• Advisors: Prof. Osama O. Awadelkarim and Prof. Akhlesh Lakhtakia Bachelor and Master of Technology in Mechanical Engineering Specialization: Product Design Minor: Industrial Engineering Indian Institute of Technology Madras, Chennai, India Aug 2005 - May 2010 <ul style="list-style-type: none">• Dissertation: Modeling thermomechanical response of stainless steel subjected to monotonic tensile and cyclic loading• Advisors: Prof. Krishnan Balasubramaniam and Prof. Chitti Venkata Krishnamurthy	
ACADEMIC AND RESEARCH EXPERIENCE	Associate Professor, Mechanical Engineering Indian Institute of Technology Kanpur July 2024 - present Assistant Professor, Mechanical Engineering Indian Institute of Technology Kanpur Dec 2017 - June 2024 Visiting Assistant Professor, Mechanical Engineering Indian Institute of Technology Kanpur Oct 2017 - Dec 2017 Distinguished Teaching Fellow, Research and Teaching Assistant College of Engineering & Center for Nanotechnology Education and Utilization Pennsylvania State University Aug 2012 - Apr 2017 Project Officer & Research Assistant Center for Non-Destructive Evaluation, Indian Institute of Technology Madras May 2008 - Jul 2010	

SPONSORED
RESEARCH

1. Multisensor characterization of solid materials for non-destructive evaluation. ₹22 Lakhs. Sponsor: IIT Kanpur (under Initiation grant). 2018-2021. (Single PI)
2. Soft acoustic metamaterials: Fabrication, computation, and instrument development. ₹36 Lakhs. Sponsor: SERB (under ECRA scheme). 2019-2022. (Single PI)
3. Practical modeling aspects of thermomechanical NDE and vibrothermography ₹6 Lakhs. Sponsor: SERB (under MATRICS scheme). 2023-2026. (Single PI)
4. Development of UHMWPE fibers and disentangled melt for impact mitigation ₹65 Lakhs. Sponsor: NTTM, Ministry of Textiles. 2023-2025. (Co-PI)
5. Scientific Research for development of agro-residue-based punnets for sustainable packaging of fruits and vegetables ₹23 Lakhs. Sponsor: SLR Infrastructure Pvt. Ltd., CSR. 2024-2025 (PI)
6. Development of foam-in-place packaging using agricultural residue ₹49.5 Lakhs. Sponsor: National Technical Textiles Mission, Ministry of Textiles. 2024-2025 (PI)

CONSULTANCY

1. Silicon carbide coating on the carbon-fiber fabric. ₹3.5 Lakhs. Sponsor: L & T Defense. 2018. (PI)
2. Mechanical and thermal properties of enclosure materials of an optical cable. ₹1 Lakh. Sponsor: Sterlite. 2018. (Co-PI)
3. Consultancy for finite element-based design optimization and testing of extruder frame and godet stand. Sponsor: Lohia Corp Limited, Kanpur, ₹10 Lakhs. India 2021-22 (Equal Co-PI)
4. Study and validation of technical task 227 & 214 recommended by OEM & identification of alternate methods. ₹35 Lakhs. Sponsor: 11 BRD, Air Force. 2019-2021. (Equal Co-PI)

FACILITIES

Acoustic impedance tube

DEVELOPED AT IITK

- Built per ASTM standards. Suitable for measurement of sound absorption and transmission loss in 100 – 2000-Hz regime

Resonant ultrasound spectroscopy

- Used for identifying all the possible 21 elastic constants of a solid

JOURNAL
PUBLICATIONS
FROM IITK

ORCID: 0000-0002-5222-0932 Google Scholar

1. K P Subudhi and C Chandraprakash, Ashby-like material property charts for Murnaghan's constants, *Journal of Materials Science* 60, 22712–22725 (2025)
2. K P Subudhi and C Chandraprakash, Ashby chart-assisted physics-informed machine learning-based prediction of elastic constants of isotropic cylinders and cuboids of arbitrary sizes, *International Journal for Computational Methods in Engineering Science & Mechanics*, 1–15 (2025)

3. K Sushil, J Ramkumar, and C Chandraprakash, Surface roughness analysis: A comprehensive review of measurement techniques, methodologies, and modeling, *Journal of Micromanufacturing*, 1–27 (2025)
4. K Sushil, A Raj, S K Jha, J Ramkumar, and C Chandraprakash, Correlation of roughness with surface properties of SS 304 and Inconel 718 substrates processed by plasma electrolytic polishing, *Surface & Coatings Technology*, 497, 131770 (2025)
5. C Chandraprakash. Emerging applications of computer vision for non-destructive evaluation: An overview, *Journal of Non-Destructive Testing & Evaluation* 21 (3) 49–53 (2024) — Invited.
6. B Y Sandeep and C Chandraprakash, Computer vision-based estimation of prestress in beams, *IEEE Transactions on Instrumentation and Measurement* 73 (7506308), 1–8 (2024)
7. S Beniwal, K Dixit, N Sinha, and C Chandraprakash, Direct ink writing of woodpile-kind alumina phononic crystals for MHz regime, *Physica B: Condensed Matter*, 691, 416306 (2024)
8. C Chandraprakash, Perspective and challenges of resonant ultrasound spectroscopy for additive manufacturing, *Journal of Non-Destructive Testing & Evaluation* 21 (1) 62–68 (2024) — Invited.
9. K Sushil, V Sharma, S K Jha, C Chandraprakash, and J Ramkumar. Effect of process parameters on the roughness and wetting characteristics of SS304 surfaces using electrolytic and plasma electrolytic polishing techniques, *Journal of The Electrochemical Society* 171 (6) 063508 (2024).
10. N Mehrotra, A Tiwari, T Bhuvana, and C Chandraprakash, Aerogel-like biodegradable acoustic foams of bacterial cellulose, *Journal of Applied Polymer Science* 141 (35), e55881 (2024)
11. O V Vigneswar and C Chandraprakash. Theory and inverse design of microperforated panels comprising arbitrary axial pore profiles for broadband low-frequency sound absorption, *Journal of Applied Physics* 135 (13) 133106 (2024).
12. K Bikumalla, T Bhuvana, A Tiwari, and C Chandraprakash, Binder-free, surfactant-based bagasse cellulose foams as acoustic boards, *Journal of Applied Polymer Science* 141 (11), 1–15 (2024).
13. A Kumar and C Chandraprakash, Fast estimation of planar angles from non-orthogonal imaging by a smartphone, *Review of Scientific Instruments* 95 (015102), 1–8 (2024).
14. S Beniwal and C Chandraprakash. Alumina-copper woodpile-kind locally resonant phononic crystal, *Applied Physics A* 129 (844), 1–7 (2023).
15. T Bhuvana, A Tiwari, and C Chandraprakash, Green fabrication of cellulose-rich agricultural residues for scalable and biodegradable acoustic boards, *Industrial Crops and Products* 204 (117404), 1–10 (2023).

16. A Kumar and C Chandraprakash, Computer vision-based on-site estimation of contact angle from 3D reconstruction of droplets, *IEEE Transactions on Instrumentation and Measurement* 72 (2524108), 1–8 (2023).
17. V Sharma and C Chandraprakash, Fabrication and bandgaps of microscale metallic phononic crystals, *International Journal of Advances in Engineering Sciences and Applied Mathematics* 15 (4), 159–166 (2023).
18. B M Bharti, T Bhuvana, and C Chandraprakash. Burst characteristics of glycerol-added chitosan films for food packaging, *ACS Food Science & Technology*, 3 (4), 772-780 (2023)
19. S Kumar, K Jahan, A Verma, M Agarwal, and C Chandraprakash, Agar-based composite films as effective biodegradable sound absorbers, *ACS Sustainable Chemistry & Engineering*, 10 (26), 8242–9253 (2022). Article selected by ACS Editors for media coverage and ACS news.
20. V Sharma and C Chandraprakash. Quasi-superhydrophobic microscale two-dimensional phononic crystals of stainless steel 304, *Journal of Applied Physics*, 131 (18), 184901 (2022). Selected among the best 52 papers from among the 209 eligible papers in all areas of applied physics research consisting of journal Editors and Editorial Advisory Board Members. 2022 Early Career Investigator Selection
21. C Chandraprakash, V C Venugopal, A Lakhtakia, and O O Awadelkarim. Long-wavelength infrared characteristics of multifunctional microfibrous thin films of Parylene C, *Microwave Optics and Technology Letters*, 61 (9), 2206–2209 (2019).
22. C Chandraprakash, C V Krishnamurthy, and K Balasubramaniam. Thermomechanical phenomenon – A non-destructive evaluation perspective, *Transactions of the Indian Institute of Metals*, 72 (11), 2905–2915 (2019).

JOURNAL
PUBLICATIONS
BEFORE IITK

1. I H Khawaji, C Chandraprakash, O O Awadelkarim, and A Lakhtakia. Selectability of mechanical and dielectric properties of Parylene-C columnar microfibrous thin films by varying deposition angle, *Flexible and Printed Electronics*, 2 (4), 045012 (2017).
2. C Chandraprakash, A Lakhtakia, and O O Awadelkarim. Parylene-C microfibrous thin films as phononic crystals, *Journal of Micromechanics and Microengineering*, 27 (7), 075012 (2017).
3. I H Khawaji, C Chandraprakash, O O Awadelkarim, and A Lakhtakia. Dielectric properties of and charge transport in columnar microfibrous thin films of Parylene C, *IEEE Transactions on Electron Devices*, 64 (8), 3360-3367 (2017).
4. C Chandraprakash, A Lakhtakia, N R Brown, W Orfali, and O O Awadelkarim. Temperature-dependent dynamic mechanical moduli of microfibrous columnar thin films of Parylene C, *Polymer Testing*, 53, 89–97 (2016).
5. C Chandraprakash, A Lakhtakia, and O O Awadelkarim. Reply to comment on surface energy of Parylene C, *Materials Letters*, 166, 325–326 (2016).

6. C Chandraprakash, A Lakhtakia, O O Awadelkarim, and W Orfali. Relative permittivity of bulk Parylene-C in the infrared regime, *Journal of Electromagnetic Waves and Applications*, 29 (16), 2139–2146 (2015).
7. C Chandraprakash, A Lakhtakia, and O O Awadelkarim. Surface energy of Parylene C, *Materials Letters*, 153, 18–19 (2015).
8. C Chandraprakash, N M Wonderling, A Lakhtakia, O O Awadelkarim, and W Orfali. Microfiber inclination, crystallinity, and water wettability of microfibrinous thin-film substrates of Parylene C in relation to the direction of the monomer vapor during fabrication, *Applied Surface Science*, 345, 145–155 (2015).
9. Y Xie, C Chandraprakash, N Nama, S Yang, M Lu, Y Zhao, J D Mai, F Costanzo, and T J Huang. Exploring bubble oscillation and mass transfer enhancements in acoustic-assisted liquid-liquid extraction with a microfluidic device, *Scientific Reports*, 5 (12572), (2015).
10. C Chandraprakash, A Lakhtakia, N R Brown, W Orfali, and O O Awadelkarim. Frequency- and temperature-dependent storage and loss moduli of microfibrinous thin films of Parylene C, *Materials Letters*, 116, 296–298 (2014).
11. C Chandraprakash, A Lakhtakia, O O Awadelkarim, and W Orfali. Acoustic scattering from microfibers of Parylene C, *Journal of Applied Physics*, 116 (13), 134905 (2014).
12. C Chandraprakash, N Nama, M I Lapsley, F Costanzo, and T J Huang. Theory and experiment on resonant frequencies of liquid-air interfaces trapped in microfluidic devices, *Journal of Applied Physics*, 114 (19), 194503 (2013).
13. C Chandraprakash, C V Krishnamurthy, K Balasubramaniam, and R V Prakash. Thermo-mechanical response of metals: Maxwell vs. Kelvin–Voigt models, *Materials Science and Engineering: A*, 560, 54–61 (2013).

REFEREED
CONFERENCE
PROCEEDINGS FROM
IITK

1. K P Subudhi, A Pandey, and C Chandraprakash, Borewell rescue operations with soft robots 6th Indian Conference on Applied Mechanics (INCAM), NIT Warangal, India (Jul 2024)
2. S Kumar, C Chandraprakash, and J Ramkumar. An experimental investigation on the behavior of voltage and current in plasma electrolytic polishing of SS304, 9th International and 30th National All India Manufacturing Technology, Design and Research Conference (AIMTDR), IIT BHU, India (Dec 2023)
3. S Kumar, C Chandraprakash, and J Ramkumar. The effect on the surface properties of titanium alloy after plasma electrolytic polishing, 19th International Symposium on Electrochemical Machining Technology (INSECT), Center for Mechatronics and Automation Technology ZeMA gGmbH, Saarbrücken, Germany (Nov 2023)
4. S Kumar, C Chandraprakash, and J Ramkumar. Plasma electrolytic polishing process: Mechanism and characteristics, 10th International Conference on Processing and Fabrication of Advanced Materials (PFAM), IIT Tirupati, India (Sep 2023)

5. C Chandraprakash, A Vashisth, T Bhuvana, and C E Bakis. Optical characterization of nanosilica-filled bisphenol-F epoxy and carbon fiber composites, *ASC 35th Technical Conference & ASTM D-30 Committee Meeting*, New York, USA (Sep 2020).

REFEREED
CONFERENCE
PROCEEDINGS
BEFORE IITK

1. I H Khawaji, C Chandraprakash, W Orfali, A Lakhtakia, and O O Awadelkarim. Electrical studies on Parylene-C columnar microfibrillar thin films, *The Electrochemical Society*, Phoenix, USA, 69 (5), 113–119 (Oct 2015).
2. M I Lapsley, D Ahmed, C Chandraprakash, F Guo, M Lu, L Wang, and T J Huang. Monitoring acoustic bubble oscillations with an optofluidic interferometer, *16th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Okinawa, Japan, 1906–1908 (Oct 2012).
3. R V Prakash, K Thiyagarajan, C Chandraprakash, and K Balasubramaniam. Thermographic evaluation of SS 304 material during monotonic loading, *ASME 2009 International Mechanical Engineering Congress and Exposition: Processing and Engineering Applications of Novel Materials*, Florida, USA, 14, 183–187 (Nov 2009).

CONFERENCE
PRESENTATIONS
FROM IITK

5 Invited Talks

1. P S Bagga and C Chandraprakash. Optimized multilayer mediums for EM shielding in X-band, *47th Photonics & Electromagnetics Research Symposium (PIERS)*, Chiba, Japan (Nov 2025)
2. K P Subudhi and C Chandraprakash. A novel methodology for fast computation of bands in phononic crystals with complex-shaped scatterers, *47th Photonics & Electromagnetics Research Symposium (PIERS)*, Chiba, Japan (Nov 2025)
3. C Chandraprakash. Thermomechanical phenomenon as a new thermal NDE technique, *1st International Conference & Exhibition on Advanced Materials and Structures*, IIT Hyderabad, India (July 2025) — Invited talk
4. C Chandraprakash, C V Krishnamurthy, K Balasubramaniam, and R V Prakash. Modeling the thermomechanical Response of stainless steel 304 under tensile load, *1st International Conference & Exhibition on Advanced Materials and Structures*, IIT Hyderabad, India (July 2025)
5. AA Chandak and C Chandraprakash. Artificial intelligence to estimate the stiffness matrix of composites, *3rd International Conference & Exhibition on NDE 4.0*, Taj Yeshwantpur, Bengaluru, India (March 2025)
6. BM Bharti, T Bhuvana, and C Chandraprakash. Glycerol-added chitosan films for food packaging: Burst and physicochemical characteristics, *International Conference on Experimental Mechanics (ICEM)*, IIT Madras, India (Oct 2024)
7. V Anand, CV Krishnamurthy, and C Chandraprakash. Tensile tests of steel wire ropes, *International Conference on Experimental Mechanics (ICEM)*, IIT Madras, India (Oct 2024)

8. PS Konchada and C Chandraprakash, Machine learning for resonant ultrasound spectroscopy of isotropic materials, *Indian Conference on Applied Mechanics (INCAM)*, NIT Warangal, India (Jul 2024) — Won first prize in the mini-symposium on undergraduate research presentation
9. S Beniwal, K Dixit, N Sinha, and C Chandraprakash. Alumina-based ultrasonic metamaterials: phononic and locally resonant phononic crystals, *Indian Conference on Applied Mechanics (INCAM)*, NIT Warangal, India (Jul 2024)
10. C Chandraprakash. Soft robots for NDE & rescue operations, *1st Mechanical Sciences Young Investigators Meet (MSYIM)*, Kanpur, India (Mar 2024) — Invited Talk
11. C Chandraprakash. Computer vision for structural health monitoring: On-site smartphone-based measurements, *33rd Annual Conference & Exhibition on Non-Destructive Evaluation*, Pune, India (Dec 2023) — Invited Talk
12. A. Kumar and C Chandraprakash. Computer vision for estimation of liquid contact angle, *33rd Annual Conference & Exhibition on Non-Destructive Evaluation*, Pune, India (Dec 2023)
13. C Chandraprakash. Soft biodegradable acoustic materials, *10th Soft Matter Young Investigators Meet 2023 (SMYIM)*, Uttarakhand, India (Jun 2023) — Invited Talk
14. S Beniwal, K Dixit, N Sinha, and C Chandraprakash. Direct-ink based manufacturing of ceramic phononic crystals, *4th Structural Integrity Conference and Exhibition (SICE)*, Indian Institute of Technology Hyderabad, India (Dec 2022) — Invited Talk
15. V Sharma and C Chandraprakash. Fabrication of microscale metallic phononic crystals using wire electric discharge micromachining process, *12th International Conference on Precision, Micro, Meso and Nano Engineering (COPEN)*, Indian Institute of Technology Kanpur (Dec 2022).
16. S Kumar, C Chandraprakash, and J Ramkumar. Integration of roughness measurement in plasma electrolytic polishing, *12th International Conference on Precision, Micro, Meso and Nano Engineering (COPEN)*, Indian Institute of Technology Kanpur (Dec 2022).
17. V Sharma and C Chandraprakash. On the fabrication and analysis of microscale metallic phononic crystals using wire electrochemical micromachining, *5th Indian Conference On Applied Mechanics (INCAM)*, National Institute of Technology Jamshedpur (Nov 2022).
18. V Sharma and C Chandraprakash. Pulse thermography for corrosion detection in a multilayer structure, *32nd Annual Conference & Exhibition on Non-Destructive Evaluation*, Ahmedabad, India (Nov 2022).
19. MZA Khan and C Chandraprakash. Ultrasonic TOFD for corrosion detection in a multilayer structure, *32nd Annual Conference & Exhibition on Non-Destructive Evaluation*, Ahmedabad, India (Nov 2022).
20. V Sharma, VRS Raju, S Amit, and C Chandraprakash. Ultrasonic TOFD and guided waves for corrosion detection in a multilayer structure, *20th Accepted for World Conference on NDT (WCNDT)*, Seoul, South Korea (June 2020).

CONFERENCE
PRESENTATIONS
BEFORE IITK

1. I H Khawaji, C Chandraprakash, O O Awadelkarim, and A Lakhtakia. Engineering the dielectric and mechanical properties of Parylene-C columnar microfibrinous thin films by controlling the deposition angles, *Materials Science & Technology: Advances in Dielectric Materials and Electronic Devices*, Pittsburgh, USA (October 2017).
2. C Chandraprakash, A Lakhtakia, and O O Awadelkarim. Charge-storage and absorption characteristics of Parylene-C columnar thin films, *Center for Dielectric and Piezoelectrics, Spring Meeting*, University Park, USA (April 2017).
3. C Chandraprakash, N M Wonderling, A Lakhtakia, O O Awadelkarim, and W Orfali. Columnar multifunctional microfibrinous Parylene-C thin films: Microfiber inclination, crystallinity, and water wettability, *Materials Research Symposium: Multifunctionality in Polymer-Based Materials, Gels and Interfaces*, Boston, USA (December 2015).
4. I H Khawaji, C Chandraprakash, W Orfali, A Lakhtakia, and O O Awadelkarim. The effects of morphology on the dielectric and mechanical properties of Parylene-C microfibrinous thin films, *The Electrochemical Society*, Cancun, Mexico, no. 11, 683–683 (October 2014).
5. C Chandraprakash, N R Brown, O O Awadelkarim, W Orfali, and A Lakhtakia. Mechanical properties of microfibrinous films of Parylene C for acoustic applications, *Materials Science & Technology: Mechanical Behavior of Technological Coatings and Thin Films – Relating Synthesis, Structure, and Mechanical Property Relationships*, Pittsburgh, USA (October 2014).

OTHER
PUBLICATIONS

1. Ph.D. thesis: Multifunctional Parylene-C microfibrinous thin films, Pennsylvania State University (February 2017).
2. Book review: Fourier modal method and its applications in computational nanophotonics, *Journal of Nanophotonics*, 7 (1), 9898 (2013).

INVITED TALKS &
LECTURES

1. “Basics of NDE methodologies and their applications in various sectors” in “Skill Development Program” on “Non-destructive evaluation techniques for aerospace & defence manufacturing” at Defence Technology & Test Centre (DTTC), Lucknow (Sep 2025)
2. “Estimating the bandgaps of anisotropic photonic crystals using plane-wave expansion method”, Faculty Development Program on “Advanced Materials for Microwave, THz, Photonics, and CMOS Sensors” Electronics and ICT Academy, NIT Patna (Jun 2025)
3. “Simple and scalable acoustic, mechanical, and electromagnetic metamaterials” at Experimental Mechanics Division, VSSC, ISRO, Trivandrum (Jun 2025)
4. “NDE: Acoustics, ultrasonics, thermography and computer vision” at Department of Mechanical Engineering, Amrita Vishwa Vidyapeetham, Amritapuri Campus (Nov 2024)
5. “Acoustics: Metamaterials and biodegradable materials” at Department of Mechanical Engineering, IIT Madras (Oct 2024)

6. “Resonant ultrasound spectroscopy to identify the elastic properties of anisotropic materials” at the 5th workshop of Indian Society for Advancement of Materials and Process Engineering (ISAMPE), Hyderabad Chapter in Advanced Systems Laboratory, DRDO Hyderabad (Oct 2024).
7. Elastography in “Introduction to Biomedical Imaging: Tomography and Microscopy Perspectives” – a short-term course at IIT Kanpur (Oct 2023).
8. “Bandgaps and scattering calculations of phononic crystals using COMSOL Multiphysics” at the 10th Webinar of *COMSOL Multiphysics Users Meet* (Sep 2023).
9. “Plane-wave expansion method for multifunctional metamaterials”, QIP Short Course on “Electromagnetic Metamaterials: Microwave-Infrared-Optical Applications” in IIT Kanpur, Uttar Pradesh, India (Aug 2019).
10. Multifunctional metamaterials of Parylene C, Millersville University, Pennsylvania, USA (Mar 2017).

RECOGNITION & MEDIA COVERAGE

- **Acoustic absorbers:** Work by Surendra Kumar et al. has been selected by the ACS editors for the ACS News. The work is also highlighted in the international and national science news: Phys.org, ScienceDaily, Technologynetworks, Eurekalert, Natureworld, Swifttelecast, Chemistryviews, New Atlas, ScienMag, Bioengineer.org, and Miragenews. It also attracted attention to the seaweed and music communities.
- **Multifunctional phononic crystals:** Work has been selected among the best 52 papers from 209 eligible papers in all areas of applied physics by Editors and Editorial Advisory Board Members of JAP. 2022 Early Career Investigator Selection.

TEACHING AT IITK **Lab coordinator**, Mechanical Engineering, IIT Kanpur May 2021 - present

- ME222A – UG – Nature and properties of materials

Instructor, Mechanical Engineering, IIT Kanpur Jan 2018 - present

- ME222A – UG – Nature and properties of materials (Lab and lectures)
- ME321A – UG – Advanced mechanics of solids (Theory of elasticity: Lab and lectures)
- ME333A – UG – 1/3: Materials testing laboratory (Lab)
- ME621A – PG – Introduction to solid mechanics (Theory of elasticity)
- ME683A – PG & UG – Techniques in non-destructive evaluation (new course developed)
- ME698E – PG & UG – Fabrication and mechanics of thin films (new modular course developed)
- ME723A – PG – Wave propagation in solids
- ME801 – PG – Mechanical Engineering Postgraduate Seminar

Tutor, Mechanical Engineering, IIT Kanpur Jan 2018 - present

- ME351A – UG – Design of machine elements
- ESO202A – UG – Mechanics of solids (Strength of materials)
- ESO209A – UG – Dynamics
- TA111 – UG – Engineering Graphics

Training for HAL employees

- Materials selection and characterization – Labs and lectures May 2022 & Jan 2023, Aug 2024
- Mechanical characterization Lab Aug 2024

TEACHING BEFORE **Distinguished Teaching Fellow**, College of Engineering, Penn. State

IITK • E MCH 211 – Statics Spring 2016

Teaching Assistant, Engineering Science and Mechanics, Penn. State

- E SC 211, 212, 213, & 214 – Nanotechnology Summer 2016
- E MCH 315 – Mechanical response of materials Fall 2011 and Spring 2012
- E MCH 211 – Statics Spring 2015
- E MCH 212 – Dynamics Fall 2016
- E SC 400, 404H – Electromagnetics & Engg. Math. (Part time) Spring 14 - Spring 2016

THESIS SUPERVISION

Name	Thesis	Program	Year	Position
Surendra Kumar	Investigation of agar-based biodegradable films as sound absorbers	M. Tech	2019	Forbes
Pushpendra Singh	Study on the effect of load for ultrasonic inspection of rail using EMAT	B. Tech & M. Tech	2019	EXL Services
Tarun Sharma (co-adviser: Prof. Nalinaksh Vyas)	Primary suspension redesign of railway bogie for improved fatigue life	B. Tech & M. Tech	2020	Jaguar Land Rover
Jishal S. Rahim	Wave propagation in periodic Cosserat medium	M. Tech	2021	ATC
Ayush Rai (co-adviser: Prof. Sameer Khandekar)	Modeling of monomer flux for metamaterial fabrication	B. Tech & M. Tech	2021	HSBC
Vishal Sharma	Corrosion detection in multilayered structure using UT-oFD and guided waves	M. S.	2021	TATA Advanced Material Systems

Name	Thesis	Program	Year	Position
Mohd. Zishan Ali Khan	Corrosion detection in multilayered structure using pulsed and pulsed-phase thermography	M. S.	2021	Mahindra & Mahindra Ltd.
Akash Kumar	Computer vision-based estimation of angles from 3D reconstruction	B. Tech & M. Tech	2022	VMock
Vishal Jain (co-adviser: Prof. Shakti Gupta)	Green's functions for thermomechanical NDE.	M. Tech	2022	Eaton Technologies
Swaraj Singh	Long-arm soft robot for non-destructive evaluation	M. Tech	2022	Algo8 AI
Venkatesh S. Bakale	Porous and locally resonant acoustic metamaterials	M. Tech	2022	Mahindra & Mahindra Ltd.
B. Yaswanth Sandeep	Beams: Biomimetic phononic crystals and computer vision-based measurement of prestress	M. Tech	2023	Decimal Point Analytics
Vigneswar O V	Forward and inverse problems in acoustic microperforated panels	M. Tech	2023	Landmark Group
Riyaj Attar Rahman	Theory and experiments for thermomechanical phenomenon in tensile tests	M. Tech	2023	Quest Global
Sidharth Beniwal	Additively manufactured phononic and locally resonant crystals of alumina	M.S.	2023	PhD Candidate at Univ. Groningen
Vikram Anand	Thermal conductivity of thin films and thermomechanical phenomenon in wire ropes	M. Tech	2023	DRDL, Hyderabad
Atul Chandak (co-adviser: Prof. Ishan Sharma)	Machine learning for damage estimation in the plates using guided waves	M. Tech	2024	Maruti Suzuki

Name	Thesis	Program	Year	Position
Sushil Kumar (co-adviser: Prof. J Ramkumar)	Comprehensive analysis of plasma electrolytic polishing: Investigation of control variables, affects on surface characteristics, and fundamental mechanisms	PhD	2025	FARE Fellow, IIT Kanpur
Behera Siddhartha	Resonant Ultrasound Spectroscopy: Computational and experiments to establish the effect of roughness, ambiance, and non-linearity	PhD	(2 nd year)	-
Saurav Nanda (co-adviser: Prof. R. Vijaya)	Multispectral stealth materials	PhD	(2 nd year)	-
Gnana Ravikumar Rakesh (co-adviser: Prof. Naren Naik)	Biomedical instrumentation	M. Tech	(2 nd year)	-

NON-THESIS SUPERVISION

1. Manan Agarwal – Project Associate – SERB ECRA (Sep 2019 - March 2022)
2. Karan Ahuja – Research Assistant – Soft robots for rescue operations – TEQIP (Jan 2020 - June 2020)
3. Vinoba Pandey – B. Tech – Investigation of a surface energy constant (Dec 2020 - May 2024)
4. Faizan Ahmed – B. Tech – Solution of Airy stress function using polar Fourier Transform (Jan 2022 - Aug 2022)
5. Kousar Jahan – Project Scientist – SERB ECRA (March 2021 - Jan 2022)
6. Nitisha Mehrotra – Project Scientist – SERB ECRA (March 2022 - July 2022)
7. Keerthy Bikumalla – Project Associate – PDA (Aug 2022 - May 2023)
8. Anjali Tiwari – Project Associate - SERB ECRA (Sep 2022 - present)
9. Arnav Pandey – B. Tech – Soft robot for the rescue of a child trapped in a borewell (May 2022 - May 2024)
10. Prajwal Konchada – B. Tech – (May 2023 - May 2025)
 - (a) Soft robot for the rescue of a child trapped in a borewell
 - (b) Machine learning in resonant ultrasound spectroscopy
 - (c) Ashby charts for Murnaghan's constants
 - (d) PWEM for complex-shaped phoxonic crystals
 - (e) Bandgaps of generalized phononic crystal beams
11. Brij Mohan Bharti – Chitosan thin films and coatings (Sep - Dec 2022 & Jan – July 2024)

12. Purabjeet Singh Bagga – B. Tech – Multilayer materials for electromagnetic shielding (Jan 2025 - present)
13. Basant Kumar Kannaujia – Project Associate – Multifunctional Kapok and bagasse foams (Jan 2025 - present)
14. Avyukth Potnuru – Project Associate – 1. Prediction of thermal properties from pulse thermography experiments using AI methods 2. Estimation of relative permittivities of ZnSe, Quartz, PDMS, and chitosan over broad regimes. (Jan 2025 - present)
15. Shloak Shetty – 1. Estimation of angles and distances on at railways crossings using computer vision. (June 2025—present)

B. Tech Projects: ME451 & ME452

- 2018-19: Rahul Shekar, Abhinav Thakur, and Rajesh Mishra.
Title: Design and development of a street sweeping machine
- 2019-20: Pinaki Shaw and Prateek Sharma.
Title: A growable soft robot to clench and move weights

COMPUTATIONAL SKILLS MATLAB, Shell scripting, COMSOL, C, Scheme, Mathematica

TECHNICAL SKILLS

Fabrication: Fibrous and conventional Parylene C chemical vapor deposition, 4 years experience in class 1000/100 cleanroom and dealing with vacuum systems

Characterization: SEM imaging, Profilometry, C-D and dielectric breakdown, Dynamical mechanical analysis, Infrared spectroscopy – ATR and Transmission, X-Ray diffraction – WAXS, Contact angle measurements, Bulk mechanical testing, Infrared thermography, Energy dispersive spectroscopy

Hands-on experience in laboratory and field

AWARDS AND HONORS

1. Paul A. Lester Memorial Award for best PhD research in microelectronics in Department of Engineering Science and Mechanics, Penn State University 2017
2. Distinguished Teaching Fellow in College of Engineering, Penn State for 2015-16
3. Won 3rd prize for poster presentation in *ESM Today*, graduate research symposium of Department of Engineering Science and Mechanics, Penn State University 2017
4. Won 2nd prize for poster presentation in *ESM Today* 2013
5. Won Project-X, a hands-on design competition in *WAVES* – Technical festival of Department of Naval Architecture and Ocean Engineering, IIT Madras 2008
6. Recipient of Merit cum Means award from IIT Madras 2005-09
7. Secured 132nd rank among 2,00,000 students in Graduate Aptitude Test Examination 2008
8. Secured 143rd rank among 4,50,000 students in All-India-Engineering-Entrance-Examination 2005

CO-CURRICULAR
ACTIVITIES

1. Outreach: Demonstrated the work on fabrication and characterization of biodegradable acoustic and packaging materials under the theme “Green Materials and Instrumentation” in IITK Samanvay, an industry engagement event (Nov 2024)
2. Outreach: Demonstrated acoustic measurements and presented poster to high school students as part of Science Open House, IITK (Feb 2020) – with Manan Agarwal
3. Reviewer for journals:
Engineering Research Express, Measurement, Measurement Science & Technology, Physics of Fluids, ACS Applied Materials & Interfaces, Applied Physics A, Journal of Elasticity, Review of Scientific Instruments, Journal of Applied Physics, Materials Characterization, ACS Applied Nano Materials, Experimental Mechanics, Journal of Applied Polymer Science, Materials Letters, Sadhana, Applied Surface Science, Physical Chemistry Chemical Physics, International Journal of Systems Science, International Journal of Adhesion and Adhesives, Journal of Micromanufacturing, and IEEE Transactions on Instrumentation and Measurement

PROFESSIONAL
SOCIETIES &
CONFERENCES

1. Co-organizer for the 1st Mechanical Sciences Young Investigators Meet at IIT Kanpur and developed the website <https://sites.google.com/view/msyim/>
2. Co-organizer for the 1st mini-symposium on undergraduate research presentations at IN-CAM 2024 & Advisor for the Conference
3. Joint Secretary for Indian Society for Applied Mechanics, 2024-26
4. Website editor for Indian Society for Applied Mechanics, 2023-present
 - (a) Designed and developed the official website for the Indian Society for Applied Mechanics single-handedly <https://www.isam.co.in/> 2023
5. Executive Committee member from IITK in Indian Society for Applied Mechanics, 2022-26
6. Life Member, Indian Society for Advancement of Materials and Process Engineering (ISAMPE) from 2025
7. Life Member, Acoustical Society of India from 2023
8. Life Member, Indian Society of Applied Mechanics from 2022
9. Life Member, The Indian Society for Theoretical and Applied Mechanics from 2022
10. Life Member, Indian Society for Non-Destructive Testing from 2022
11. Member, Mechanical Engineering Division, The Institution of Engineers (India) from 2020
12. Member of ‘The Materials Research Society’ for 2015–17
13. Student member of Material Advantage Program (TMS, ACerS, AIST, ASM) for 2014–17

KEY ADMINISTRATIVE ACTIVITIES	1. Website coordinator in Mechanical Engineering, IITK, 2020-26	
	2. UG Laboratory coordinator for the Materials Testing Lab 2021-2026	
	3. Seminar coordinator in Mechanical Engineering, IITK, 2019-20	
	4. Anchor for Diamond Jubilee Institute Foundation day, IITK, 2018	
	5. Co-organized EC Subbarao lecture in MSE, IITK, 2018	
	6. Judge for: Student awards (2018), Techkriti competitions (2018 & 19), Smart India Hackathon (2018 & 19), and Project Scientist (2018 & 19) – IITK	
	7. President (Aug'13 - May'14) and Vice-President (Aug'14 - May'15) Engineering Science and Mechanics Graduate Student Council, Penn State	
INDUSTRIAL EXPERIENCE	Technical Manager in Noise Vibration Harshness department Engineering Research Center, Tata Motors Ltd., Pune, India	Sep 2010 - Jul 2011
	<ul style="list-style-type: none"> • Quantitative analysis for noise and vibration characteristics of small commercial vehicles • Developed technical reports and presentations for field and external collaborations 	
	Internship Trainee Engineering Design Centre, Caterpillar India Private Ltd., India	May 2008 - Jul 2008
	<ul style="list-style-type: none"> • Designed anti-toppling mechanisms and stability criteria for shop floor structures • Performed 'Value Stream Mapping' for the Virtual Manufacturing Engineering group 	