

Curriculum vitae

Dr. Jagannathan Thimmarajampet Kalathi is currently serving as an **Associate professor** in his alma mater, the Department of Chemical Engineering, National Institute of Technology Karnataka (NITK, Surathkal), India. He received his bachelor's degree in Chemical Engineering from Annamalai University, India, and worked in process industries. Later, he did his master's in Industrial Pollution Control at the NITK, India. He earned his doctoral degree in Chemical Engineering from the Indian Institute of Technology Madras (IITM) in 2011 for the work carried out on flow modelling and applications of flow induced by acoustic field under the mentorship of Prof. R. Nagarajan (IITM). Later, he worked as a post-doctoral fellow in Prof. Sanat Kumar's Group at **Columbia University in the city of New York** before returning to his alma mater. His current research interests include understanding the dynamics of nanoparticles and polymer chains in polymer nanocomposites using molecular simulations, synthesis and characterization of polymer nanocomposites and other nanomaterials for different applications, particularly for environmental protection and energy storage applications. He has published about **30 articles** in peer-reviewed journals and international conferences. He along with his research scholars holds an **Indian patent** on dielectric ink preparation. He has guided two Ph.D. scholars and many master and undergraduate students for their thesis work.



Associate Professor

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Clarivate
Web of Science

<https://www.webofscience.com/wos/author/record/ACX-4519-2022>

Previous Positions:

Assistant Professor (Oct 2013 to Oct 2023)

Post-Doctoral Research Scientist (Nov 2010 – Sep 2013)

EDUCATION

Ph.D. (2011)

Indian Institute of Technology Madras (IIT Madras)

CGPA: **9.2/10** (Credentials in the coursework)

M.Tech. (2005)

Industrial Pollution Control

National Institute of Technology Karnataka (NITK), Surathkal

CGPA: **8.06/10**, First Class with Distinction

B.E. Chemical Engineering (2000)

Annamalai University, Chidambaram

Marks secured: **78.00 %**, First Class with Distinction

HSCC

1996

Board of Higher Secondary Examination, Tamilnadu, India

Marks secured: **80.50 %**

SSLC

1994

Board of Secondary Education, Tamilnadu, India

Marks secured: **88.40 %**

RESEARCH AREAS OF INTEREST

- Dynamics of complex fluids
- Molecular simulations of polymer nanocomposites
- Polymers and polymer nanocomposites
- Process intensification using power ultrasound
- Chemical reactor modelling and simulation
- Energy, Water and Sustainability

COMPUTATIONAL SKILLS

- Programming: MATLAB, FORTRAN, Familiar with C, C++, ASPEN
- Computational Fluid Dynamics Tools: GAMBIT, ANSYS
- Molecular Dynamics tools: LAMMPS, VMD

COURSES TAUGHT @ NITK

1. Chemical Reaction Engineering – I
2. Chemical Reactor Design
3. Transport Phenomena
4. Molecular and Turbulent Transport
5. Introduction to Molecular Simulations
6. Mathematical Modeling of Environmental Systems

PH.D. GUIDANCE:

Completed: 02 On-going: 03

M.TECH. THESIS GUIDANCE:

Completed: 33 On-going: 03

B.TECH. PROJECT GUIDANCE:

Completed: 16 On-going: 01

PATENTS:

Indian Patents:

Kalathi, J.T., Kishor Kumar M. J, Pavan Pujar. "Method And System For Preparing A Lanthanum Zirconium oxide Based Dielectric Ink For Micro Electronics" (**Patent No. 347616**) granted on 24/09/2020 IPO, Chennai.

Kalathi, J.T., Kishor Kumar M. J. Method and Composition for Fabricating a High-k Dielectric Material (Application No. 201941047909) Filed on 23/11/2019 IPO, Chennai. (In order of grant, Awaiting approval from DRDO/DAE).

PHD THESIS EVALUATION AND EXAMINER:

NIT Trichy, 2019
Anna University, 2025

DOCTORAL COMITTE MEMBER (EXTERNAL):

MIT Manipal, 2024-todate
JSS Science and Technology Univeristy, Mysore. 2024-todate

OTHER ACTIVITIES (EXTERNAL):

Reviewed more than 40 manuscripts for peer-reviewed international journals (see Orcid)
Conducted third-party environmental audit for KSPCB, India

TALKS IN SEMINARS AND WORKSHOPS

1. A lecture on "Modelling of acoustic cavitation dynamics using MATLAB" during Two-day National Workshop on "Advanced Mathematical Approaches in Chemical and Environmental Engineering using MATLAB and Simulink" from Feb 28 - Mar 1, 2015, held at NIT Calicut, India.
2. A lecture on "Global Carbon Cycle" during Four-day National Workshop on "Recent Challenges in Atmospheric and Earth Sciences" during Dec 27-30, 2014, held at NITK, Surathkal, India.
3. Delivered a talk on "Fundamentals and Applications of Nanomaterials for the preparation of Biosensors" in the FDP on "Recent Advanced Technologies for the development of Biosensors and their Applications" held at Sapthagiri College of Engineering, Bengaluru, 27 Oct- 01 Nov 2021.
4. Delivered a talk on "Process Intensification and nanotechnology applications using ultrasound in polymer nanocomposites synthesis" on 15th June 2024 in a symposium held honoring Prof. R.Nagarajan at IIT Madras.
5. Delivered a talk on "Role of Polymer nanocomposites in energy storage applications" in a FDP on "Advances and Recent Trends in Environmental and Energy Applications of Nanomaterials" held at MIT Manipal from 4th to 7th December 2024.
6. Delivered a talk on "Polymer nanocomposites for thin-film dielectric applications" on 28th June 2025 in the Department of Polymer Science and Technology JSS Science and Technology University, Mysore.

WORKSHOPS ORGANIZED

- Coordinated the 5-Day National Level Training & Workshop on "Chemical, Biological, Radiological and Nuclear (CBRN) Disaster: Collaborative Resilient Strategies for Preparedness and Response" at NITK, Surathkal, March 2024.
- Coordinated the workshop on 'Recent Challenges in Atmospheric and Earth Sciences' held at NITK from 27th - 30th Dec 2014 (Sponsored by TEQIP-I)
- Co-convenor for "Chemference, 2009", Annual Research Symposium organized at IIT Madras, India.

WORKSHOPS ATTENDED

- Faculty Development Programme held at NITK-STEP during Dec 16-26, 2013.
- One-day "Workplace Sensitization" workshop held at NITK, Nov 22, 2013.
- STC on "Thermodynamic Analysis of Modern Separation Processes" held at IITM from 24-28 Nov 2014
- Funmolsim 2019, IIT Kanpur

BOOK CHAPTERS

1. Solar Enhanced Soaring: Tapping into Ambient Solar Energy for Optimized Airfoil Performance, Reclaiming Eden, pp 145-173, eBook ISBN9781003496120.
2. Hybrid Strategies for the treatment of latex-like wastewater from industries, Adaptive Engineering, Woodhead Publishing, Elsevier, pp7-35, ISBN: 978-0-443-22184-2

PUBLICATIONS

Journals

1. Gowtham C and **Kalathi J. T. (2025)** CFD Modeling and simulation of catalytic pyrolysis of heavy oil in a tapered fluidized bed reactor, **Chemical Product and Process Modeling** (accepted).
2. Kishor Kumar, M. J., **Kalathi, J. T. (2020)** Investigation on the dielectric performance of PVDF-HFP/LZO composites. **Journal of Alloys and Compounds**, **843**, 155889. (doi: <https://doi.org/10.1016/j.jallcom.2020.155889>)
3. Pujar, P., M.J., Kishor Kumar, Naqi, M., Gandla, S., Hae W., Jung, S. H., Cho, H. K. **Kalathi, J. T., Kim, S. (2020)** High-Intensity Ultrasound-Assisted Low-Temperature Formulation of Lanthanum Zirconium Oxide Nanodispersion for Thin-Film Transistors. **ACS Appl. Mater. Interfaces** **12**, (40), 44926–44933. (doi: <https://doi.org/10.1021/acsami.0c11193>)

4. Kishor Kumar, M. J., **Kalathi, J. T.** (2019) PMMA-LZO Composite Dielectric Film with an Improved Energy Storage Density. **Journal of Electronic Materials** **48 (12)**, 7654-7661. (doi: <https://doi.org/10.1007/s11664-019-07580-1>)
5. Kishor Kumar, M. J., **Kalathi, J. T.** (2019) Interface Dominated Dielectric Response of PS-Fe₃O₄ Patchy Microspheres. **Langmuir** **35(43)**, 13923-13933. (doi: <https://doi.org/10.1021/acs.langmuir.9b02117>)
6. Buruga, K.; **Kalathi, J. T.** (2019) Synthesis of poly(styrene-co-methyl methacrylate) nanospheres by ultrasound-mediated Pickering nanoemulsion polymerization. **Journal of Polymer Research**, **26 (9)**, 210. (doi: <https://doi.org/10.1007/s10965-019-1871-9>)
7. Kezia Buruga, Hocheol Song, Shang Jin, Nanthi Bolan, **J. T. Kalathi**, Ki-Hyun Kim. (2019) A review on functional polymer-clay based nanocomposite membranes for treatment of water, **Journal of Hazardous Materials** **379**, 120584. (doi: <https://doi.org/10.1016/j.jhazmat.2019.04.067>)
8. Buruga, K., **Kalathi J. T.** Performance of halloysite nanotube/poly(styrene-co methylmethacrylate) nanocomposite coatings for the protection of soda-lime glass, **Journal of Alloys and Compounds** **774**, pp 370-377, 2019. (doi: <https://doi.org/10.1016/j.jallcom.2018.09.284>)
9. Buruga, K., **Kalathi, J. T.** Fabrication of γ -MPS modified HNTs-PMMA nanocomposites by ultrasound-assisted mini-emulsion polymerization, **The Journal of The Minerals, Metals & Materials Society (Springer)**, **70(7)**, pp1307-1312, 2018. (doi: <https://doi.org/10.1007/s11837-018-2829-9>)
10. Kishore Kumar, M.J., **Kalathi, J. T.** Low-temperature sonochemical synthesis of high dielectric Lanthanum doped Cerium oxide nanopowder, **Journal of Alloys and Compounds** **748**, pp 348-354, 2018. (doi: <https://doi.org/10.1016/j.jallcom.2018.03.096>)
11. Buruga, K., **Kalathi, J. T.**, Ki-Hyun Kim, Yong Sik Ok, Boukhvalov Danil. Polystyrene-halloysite nanotube membranes for water purification, **Journal of Industrial and Engineering Chemistry** **61**, pp 169-180, 2018 (doi: <https://doi.org/10.1016/j.jiec.2017.12.014>)
12. Buruga, K., **Kalathi J. T.** A facile synthesis of halloysite nanotubes based polymer nanocomposites for glass coating application, **Journal of Alloys and Compounds** **735**, pp 1807-1817, 2018. (doi: <https://doi.org/10.1016/j.jallcom.2017.11.211>)
13. Buruga, K., **Kalathi, J. T.** Sonochemical Synthesis of Cetyl Trimethylammonium Bromide modified Halloysite Nanotubes-Polystyrene Nanocomposites by solution casting method. **Asian Journal of Chemistry**, **29 (1)**, pp 199-202, 2017. (doi: <https://doi.org/10.14233/ajchem.2017.20377>)
14. Ge, T.; **Kalathi, J. T.**, Halverson, J., Grest, G. S., Rubinstein, M. Nanoparticle Motion in Entangled Melts of Linear and Non-Concatenated Ring Polymers, **Macromolecules** **50 (19)**, pp 1749-1754, 2017. (doi: <https://pubs.acs.org/doi/abs/10.1021/acs.macromol.6b02632>)
15. **Kalathi, J. T.**, Kumar, S. K., Rubinstein, M., Grest, G. S. Rouse Mode analysis of chain relaxation in Polymer Nanocomposites, **Soft Matter** **11(20)**, pp 4123-32, 2015. (doi: [10.1039/c5sm00754b](https://doi.org/10.1039/c5sm00754b))
16. **Kalathi, J. T.**, Kumar, S. K., Rubinstein, M., Grest, G. S. Rouse Mode analysis of chain relaxation in homopolymer melts, **Macromolecules** **47(19)**, pp 6925-6931, 2014. (doi: [10.1021/ma500900b](https://doi.org/10.1021/ma500900b))
17. **Kalathi, J. T.**, Yamamoto, U., Schweizer, K. S., Grest, G. S., Kumar, S. K. Nanoparticles diffusion in polymer nanocomposites, **Physical Review Letters** **112**, pp. 108301, 2014.

- (doi: <http://dx.doi.org/10.1103/PhysRevLett.112.108301>)
18. **Kalathi, J. T.**, Mohanan, S., and Nagarajan, R. Mechanistic modeling of destratification in cryogenic storage tanks using ultrasonics. **Ultrasonics** **54**, pp. 76-83, 2014.
(doi: <http://dx.doi.org/10.1016/j.ultras.2013.05.009>)
 19. **Kalathi, J. T.**, Grest, G. S., Kumar, S. K. Universal viscosity behavior of Polymer Nanocomposites, **Physical Review Letters** **109** (19), pp. 198301, 2012.
(doi: <http://dx.doi.org/10.1103/PhysRevLett.109.198301>)
 20. **Kalathi, J. T.**, Nagarajan, R., Ramamurthy, K. Effect of ultrasound on bubble breakup within the mixing chamber of an effervescent atomizer. **Chemical Engineering and Processing: Process Intensification** **50**, pp. 305-311, 2011. (doi: <http://dx.doi.org/10.1016/j.cep.2011.01.006>)
 21. **Kalathi, J. T.**, Mohanan, S., Nagarajan, R. Experimental investigation of high-frequency, high-intensity ultrasonics for thermal destratification of liquids stored in insulated containers: Effect of storage pressure. **Int. Journal of Transport Phenomena** **11** (4), pp. 283-308, 2010.
 22. **Kalathi, J. T.**, Nagarajan, R. Investigation of acoustic cavitation energy in ultrasonic tanks. **Journal of Pure and Applied Ultrasonics** **32** (4), pp. 95-100, 2010.

Conference Proceedings

1. Mohd Sahil Akhtar, David S-K. Ting, **Jagannathan T. Kalathi** "Bio-inspired study of thermal effects on NACA0012 airfoil at Reynolds Number of 33,000" Proceedings of 2022 Responsible Engineering and Living Symposium Windsor, Ontario, Canada June 23-24, 2022.
2. Kishor Kumar M.J and **Jagannathan T.K** "PMMA-LZO composite dielectric film with an improved energy storage density" RACEEE-2019, **14-15 Feb 2019** SSN College, Chennai.
3. Kishor Kumar M.J and **Jagannathan T.K.** "Sonochemical preparation of LZO dielectric ink for thin film capacitor" **IUMRS-ICEM-2018, 19-24 Aug 2018** held at Daejeon DCC, South Korea.
4. Kishor Kumar M.J, Kezia B, **Jagannathan T.K.** Sonochemical Synthesis of PMMA-HNT by solution casting method. **International Conference on Advanced Materials and Technology ICMAT-2016, 26-28 May 2016**, SJCE Mysuru.
5. Kishor Kumar M.J and **Jagannathan T.K.** "A facile sonochemical synthesis of La2O3" **CHEMCON 2016, 27-30 December 2016** held at AC tech and IIT Madras.
6. **Jagannathan T. Kalathi**, Kishor Kumar M.J , Satabdi Hazarika, Sanjeevan G Akshay. Sonochemical fabrication of polystyrene-iron oxide (PS-Fe3O4) composite particles for thin film dielectric, **ICSM 2018 3rd International Conference on Soft Materials, 2018. MNIT, Jaipur, December 9-14, 2018.**
7. Buruga, K., **Kalathi, J. T.** Ultrasound-assisted Synthesis of Poly(styrene-co methylmethacrylate)-HNT's Nanocomposites by in-situ Emulsion Copolymerization and its Characterization, **ICAAMM-2016** proceedings publication in **Materials today Proceedings**, **4**, pp 7467-7474, 2017.
(doi: <https://doi.org/10.1016/j.matpr.2017.07.078>)
8. Buruga, K., **Kalathi, J. T.** Effects of Solvents on Structure, Morphology and Thermal Stability of Polystyrene-HNTs Nanocomposites by Ultrasound Assisted Solution Casting Method, **ICEMS 2016** proceedings publication in **Materials Today: Proceedings** **4**, pp 9434–9439, 2017.
(doi: <https://doi.org/10.1016/j.matpr.2017.06.199>)

9. Buruga, K., **Kalathi, J. T.** (2017). Sonochemical Synthesis of Poly (Styrene-co-Methylmethacrylate)-HNT's Nanocomposites by Mini-emulsion Polymerisation, **ICACE 2016 proceedings: Mohan B. R., Srinikethan G., Meikap B. (eds.) Materials, Energy and Environment Engineering**, Springer, Singapore. ISBN 978-981-10-2674-4. (doi: https://doi.org/10.1007/978-981-10-2675-1_7)
10. Buruga, K., **Kalathi, J. T.** (2015). Studies on morphology and thermal stability of polystyrene-clay nanocomposites, **International Conference on New Frontiers in Chemical, Energy and Environmental Engineering 2015**, NIT Warangal, India.
11. **Kalathi, J. T.**, Kumar, S. K., Gary, G. S. (2013). Diffusion of nanoparticles in dense polymer melts, **APS March Meeting 2013**, Baltimore, USA.
12. **Kalathi, J. T.**, Kumar, S. K., Gary, G. S. (2012). Shear viscosity of polymer nanocomposites from NEMD simulations, **APS March Meeting 2012**, Boston, USA.
13. Kumar, S. K., **Kalathi, J. T.**, Grest, G.S. (2012). Non-Einstein viscosity behavior of polymer nanocomposites, Abstracts of paper of the American Chemical Society. Vol. 244. **ACS Meeting 2012**, Washington, DC, USA.
14. **Kalathi, J. T.**, Nagarajan, R., Sivakumar, C. (2008). Visualization of Ultrasonically-induced Flow using Particle Image Velocimetry (PIV). **The 13th International Symposium on Flow Visualization (ISFV)**, July 1-4, 2008, Nice – French Riviera, France.
15. Nagarajan, R., Menon, P., Vetrimurugan, R., **Kalathi, J. T.** (2007). Visualization of high-frequency, high-intensity ultrasonic fields using PIV. **6th Pacific Symposium on Flow Visualization and Image Processing (PSFVIP)**, May 16-19, 2007, Hawaii, USA.
16. **Kalathi, J. T.**, Nagarajan, R. (2007). Theoretical and experimental studies of acoustic cavitation in ultrasonic tanks. **Chemcon-2007**, Dec 26-30, 2007, Kolkata, India.
17. **Kalathi, J. T.**, Choudhary, S. K., Nagarajan, R., Ramamurthy, K., Srinivasan, K. (2009). Ultrasonically enhanced atomization. **ChEmference'09- Annual Research Symposium**, Aug 22-23, 2009, IIT Madras, Chennai, India.
18. **Kalathi, J. T.**, Nagarajan, R. (2009). Investigation of acoustic cavitation energy in ultrasonic tanks. **18th National Symposium on Ultrasonics-NSU-XVIII**, Dec 21-23, 2009, VIT University, Vellore, India.