

Himanshu Tyagi

Associate Teaching Professor
John and Willie Leone Family Department of Energy and Mineral Engineering
Pennsylvania State University
232 Hosler Building, University Park, PA 16802 USA
himanshu.tyagi@psu.edu Office: (814) 865-0546

EDUCATION

Ph.D.	Mechanical Engineering	Arizona State University, Tempe, U.S.A, 2008
M.A.Sc.	Mechanical Engineering	University of Windsor, Windsor, Canada, 2005
B.Tech.	Mechanical Engineering	Indian Institute of Technology Delhi, India, 2001

RESEARCH AND PROFESSIONAL EXPERIENCE

2025 - Pennsylvania State University, USA, Associate Teaching Professor
2015 - Indian Institute of Technology Ropar, India, Associate Professor (on leave since 2024)
2009 - 2015 Indian Institute of Technology Ropar, India, Assistant Professor
2008 Intel Corp., U.S.A., Graduate Research Intern
2001 - 2003 Siemens Ltd., India, Design Executive

PROFESSIONAL INTERESTS

Research: Thermo-fluids, bio-heat transfer, nanofluids, nanoscale heat transfer, clean and sustainable energy, solar energy, geothermal energy, water desalination and purification, energy storage, hydrogen, battery thermal management, thermodynamics, thermal management and packaging of electronic devices.

Teaching: Heat and mass transfer, thermodynamics, solar thermal energy, fluids mechanics, applied numerical methods, water desalination, experimental engineering, energy and environment, wind and hydro energy.

TEACHING EXPERIENCE

Penn State University

Undergraduate Level

EGEE 101 Energy and the Environment, Fall 2025, Spring 2026

EGEE 438 Wind and Hydropower Energy Conversion, Spring 2026

Graduate Level

EME 531 Thermodynamics of Energy and Mineral Systems, Fall 2025

Indian Institute of Technology Ropar

Undergraduate Level

Clean and Sustainable Energy Engineering, Spring 2013-2015

Control Engineering Laboratory, Fall 2016-2017

Design Laboratory, Spring 2019-2020

Engineering Communication, Fall 2009, 2011-2013

Engineering Drawing, Spring 2020-2022 & Fall 2022-2023

Fluid Mechanics, Spring 2010-2012

Heat and Mass Transfer, Fall 2014-2018, 2024

Propulsion Technologies, Spring 2012

Theory of Machines, Summer 2013

Thermodynamics (Energy Science and Technology), Fall 2009-2014

Thermo-fluids Laboratory, Spring 2011-2014, 2016-2018, 2023

Workshop Practice, Fall 2019

Graduate Level

Advanced Conduction and Radiative Heat Transfer, Spring 2010, 2013

Advanced Mechanical and Materials Engineering Laboratory, Spring 2010

Advanced Thermodynamics, Fall 2019-2021

Applied Numerical Methods, Fall 2022-2023

Solar Thermal Engineering, Fall 2010, 2013, 2016-2020

Thermal Desalination of Saline Water, Spring 2021-2023

Thermal Management of Electronics, Spring 2024

Turbulent Flows, Spring 2010

PHD AND MASTER'S THESIS ADVISING

PhD Thesis

Abhishek S. Kashyap, 'Integration of Solar Thermal System with Latent Heat Thermal Energy Storage', PhD Thesis, IIT Ropar, India, *(thesis submitted in 2025 and defense expected soon)*.

Ravi Beniwal, 'Hybrid Heat Pump Systems for Air Conditioning, Process Cooling, Heating, and Desalination Applications Using Natural Refrigerants', PhD Thesis, IIT Ropar, India, 2026.

Kapil Garg, 'Numerical and Experimental Investigations of Solar-Powered Multi-Stage Flash and Humidification-Dehumidification Desalination using Volumetric Absorption', PhD Thesis, IIT Ropar, India, 2021 (joint supervision).

Amit R. Patel, 'Decentralized Off-Grid Electricity Generation from Biooil Produced using the Intermediate Pyrolysis of Agricultural Residual Waste', PhD Thesis, IIT Ropar, India, 2019 (joint supervision).

Vishal Bhalla, 'Experiments on Solar Thermal Systems Utilizing Nanoparticles-Laden Fluid Under Stagnation and Flow Conditions', PhD Thesis, IIT Ropar, India, 2018.

Sanjeev Soni, 'Heat Transfer Phenomenon and Optical Interaction during Nanoparticle Assisted Thermal Therapy', PhD Thesis, IIT Ropar, India, 2015 (joint supervision).

Vikrant Khullar, 'Heat Transfer Analysis and Optical Characterization of Nanoparticle Dispersion-Based Solar Thermal Systems', PhD Thesis, IIT Ropar, India, 2014.

Master's Thesis

Vishal Yadav, "Thermal management of Li-ion battery", M.Tech Thesis, IIT Ropar, India, 2025.

Manas Bhatnagar, "Experimentally Informed Modelling of the Degradation Process in Bioresorbable Stents" M.Tech Thesis, IIT Ropar, India, 2025 (joint supervision).

Gourav Vashistha, "Design Aspects of Metallic Diaphragm for High Pressure Hydrogen Compressors", M.Tech Thesis, IIT Ropar, India, 2025 (joint supervision).

Davinder Singh, M.Tech. thesis, "Analysis of Direct Contact and Photothermal Membrane Distillation", M.Tech Thesis, IIT Ropar, India, 2025.

Akshit Singh Thakur, "Design and Development of LOHC (Liquid Organic Hydrogen Carrier) based Hydrogen Storage System", M.Tech Thesis, IIT Ropar, India, 2025 (joint supervision).

Vivek Shukla, "Development of High Accuracy Mass Property Measurement System", M.Tech Thesis, IIT Ropar, India, 2024.

Shubham Kumar, "Mathematical Modelling and Reduced Order Modelling for Thermal Systems by Proper Orthogonal Decomposition Method", M.Tech Thesis, IIT Ropar, India, 2024 (joint supervision).

Sharwan Godara, "Experiments and Simulations based Investigations into Hydrogen Embrittlement Scenarios of Indian Natural Gas Pipelines used for Large-Scale Hydrogen Transport", M.Tech Thesis, IIT Ropar, India, 2024 (joint supervision).

Jeetesh Dwivedi, "Thermal Desalination of Saline Water using Membrane Distillation", M.Tech Thesis, IIT Ropar, India, 2024.

Badri Prasad Gatadi, "Gallium Oxide Heterostructure based Solar-Blind Photodetectors", M.Tech Thesis, IIT Ropar, India, 2024 (joint supervision).

Aniket Singh, "Development of a Liquid Hydrogen Storage System for Automotive Applications", M.Tech Thesis, IIT Ropar, India, 2024 (joint supervision).

Khushwant S. Chauhan, "Evaluation of Thermal Performance Improvements in 1.5U Server over 1U Server Using CFD", M.Tech Thesis, IIT Ropar, India, 2023.

Jarapala Sridivya Nandini, "Experimental Study of the HDH Desalination System Combined with the Photo-Thermal Effects of Nanofluids", M.Tech Thesis, IIT Ropar, India, 2023.

Tanuj Singh, "Thermodynamic Analysis of Atmospheric Water Harvesting System", 2021-22. M.Tech Thesis, IIT Ropar, India, 2022.

Dheeraj Chamoli, "Thermal Analysis of Membrane Distillation Coupled with Solar Collector: A Numerical Study", 2021-22. M.Tech Thesis, IIT Ropar, India, 2022.

Gunjan Gupta, "Numerical Study of Micro-Solar Collector for Hydrogen Production Using Methanol Steam Reformation", M.Tech Thesis, IIT Ropar, India, 2021.

Vismay V. Kulkarni, "Numerical Analysis of Flat Plate Collector to Investigate the Performance Enhancement with Insertion of Porous Foam", M.Tech Thesis, IIT Ropar, India, 2021.

Hemabh Trivedi, M.Tech. thesis titled "Solar Energy Absorption by Multi-Dimensional Solar Cells", M.Tech Thesis, IIT Ropar, India, 2020.

KVS Teja, "Temperature Regulation and Heat Transfer in Termite Mounds", M.Tech Thesis, IIT Ropar, India, 2020.

Parth Patil, "Solar Thermal Energy Storage Using Phase Change Materials (PCM)", M.Tech Thesis, IIT Ropar, India, 2020.

Swapnil Salvi, "Numerical Analysis of Phase Change Materials for use in Energy Efficient Buildings", M.Tech Thesis, IIT Ropar, India, 2018.

RESEARCH GRANTS

Global Initiative of Academic Networks (GIAN), Ministry of Education, India, "Fundamentals of Nanoscale Thermal Transport and Electrochemistry in Advanced Lithium-Ion Batteries", 2024-2025, (PI).

Science and Engineering Research Board (SERB), India, "Solar Energy-Driven Photothermal Membrane Distillation System", 2024-2027, (co-PI).

Department of Science & Technology (DST), India, "Value Addition to Agricultural Waste of Wheat Straw, Rice Straw and Rice Husk by Biochar Production using Intermediate Pyrolysis", 2021-2024, (co-PI).

Science and Engineering Research Board (SERB), India, "Water Purification Using Solar Energy-Driven Humidification-Dehumidification (HDH) Technique", 2019-2023, (PI).

Department of Biotechnology (DBT), India, "Solid Tumor Targeting using Homing Peptides and Plasmonic Photothermal Technique", 2018-2022, (co-PI).

Indo-US Science and Technology Forum (IUSSTF), India, "Energy Efficient Technologies for Smart Buildings", 2016-2018, (PI).

Interdisciplinary Research Funding, Indian Institute of Technology Ropar, India, "Solar Thermal Energy", 2016-18, (PI).

Department of Science & Technology (DST-SERB), India, "Investigations into Direct Absorption of Solar Energy Using Nanofluids", 2013-2016, (PI).

Indo-US Science and Technology Forum (IUSSTF), India, "Indo-US Workshop: Recent Advances in Micro/Nano-scale Heat Transfer and Applications in Clean Energy Technologies", 2013-2014, (PI).

RBS Bangalore, India, "Technology Survey for Water Purification", 2012, (co-PI).

Institute Scheme for Innovative Research and Development (ISIRD) Project, Indian Institute of Technology Ropar, India, "Experimental Investigation of Concentrated Direct Absorption Solar Collector (DAC) Using Nanofluids", 2009-2012, (PI).

PUBLICATIONS

(A) Refereed Journal Papers (International)

- [A47] Kashyap, A. S., Bhalla, V., and **Tyagi, H.**, 2026, "A Novel Integration of Direct Absorption Solar Collector with Thermal Energy Storage: A Proof-of-Concept Investigation", Accepted for publication in *Applied Thermal Engineering*. (DOI: <https://doi.org/10.1016/j.applthermaleng.2026.130510>)
- [A46] Kashyap, A. S., Garg, K., and **Tyagi, H.**, 2026, "Numerical Simulation of a Solar-Assisted Shell-and-Tube Latent Heat Storage Unit under Varying Solar Thermal Conditions for Domestic Applications", *Thermal Advances.*, Vol. 6, p. 100104. (DOI: <https://doi.org/10.1016/j.thradv.2026.100104>)
- [A45] Kashyap, A. S., Bhalla, V., and **Tyagi, H.**, 2026, "An Investigation on Volumetric Absorption System for Solar Thermal Energy Conversion and Storage", *Thermal Science and Engineering Progress*, Vol. 69, p. 104455. (DOI: <https://doi.org/10.1016/j.tsep.2025.104455>)
- [A44] Kashyap, A. S., Bhalla, V., and **Tyagi, H.**, 2025, "Uniform Temperature Distribution and Reduced Convection Losses: Top and Bottom Heating Strategies for Nanofluid and Surface Absorption-based Solar Thermal Systems", *Applied Thermal Engineering*, Vol. 259, p. 124904. (DOI: [10.1016/j.applthermaleng.2024.124904](https://doi.org/10.1016/j.applthermaleng.2024.124904))
- [A43] Kulkarni, V., Kashyap, A. S., Pal, M., and **Tyagi, H.**, 2025, "Performance Analysis of Solar Collector Integrated with Porous Metallic Foam", *Applied Sciences*, Vol. 15(5), p. 2432. (DOI: [10.3390/app15052432](https://doi.org/10.3390/app15052432))
- [A42] Nandini, J. S. D., Bhalla, V., and **Tyagi, H.**, 2025, "Photothermal Analysis of Novel Nanoparticles-laden Fluid-based Solar Thermal Receiver: A Proof-of-Concept Experimental Study", *International Journal of Thermofluids*, Vol. 27, p. 101158. (DOI: [10.1016/j.ijft.2025.101158](https://doi.org/10.1016/j.ijft.2025.101158))
- [A41] Beniwal, R., and **Tyagi, H.**, 2024, "Performance Analysis of Sub-Cooled Transcritical CO₂ Refrigeration System Using Vapour Absorption Refrigeration System and Dew Point Evaporative Cooling", *Energy*, Vol. 310, p. 133219. (DOI: [10.1016/j.energy.2024.133219](https://doi.org/10.1016/j.energy.2024.133219))
- [A40] Chauhan, K. S., Beniwal, R., and **Tyagi, H.**, 2024, "Thermodynamic Analysis of a Hybrid Novel Solar Powered Humidification-Dehumidification Coupled with Direct Contact Membrane Distillation System", *Energy Conversion and Management*, Vol. 300, p. 117930. (DOI: [10.1016/j.enconman.2023.117930](https://doi.org/10.1016/j.enconman.2023.117930))
- [A39] Chauhan, K. S., and **Tyagi, H.**, 2023, "Thermal Modeling of Fluid Flow and Heat Transfer in Direct Contact Membrane Distillation", *Energy Conversion and Management*, Vol. 291, p. 117249. (DOI: [10.1016/j.enconman.2022.117249](https://doi.org/10.1016/j.enconman.2022.117249))
- [A38] Garg, K., Beniwal, R., Das, S. K., and **Tyagi, H.**, 2023, "Experimental Investigation of a Low-Cost Humidification-Dehumidification Desalination Cycle using Packed-Bed Humidifier and Finned-Tube Heat Exchanger", *Thermal Science and Engineering Progress*, Vol. 41, p. 101858. (DOI: [10.1016/j.tsep.2023.101858](https://doi.org/10.1016/j.tsep.2023.101858))
- [A37] Makauskas, P., Pal, M., Kulkarni, V., Kashyap, A. S., and **Tyagi, H.**, 2023, "Comparative Study of Modelling Flows in Porous Media for Engineering Applications using Finite Volume and Artificial Neural Network Methods", *Engineering with Computers*. (DOI: [10.1007/s00366-023-01814-x](https://doi.org/10.1007/s00366-023-01814-x))
- [A36] Beniwal, R., Garg, K., and **Tyagi, H.**, 2023, "Thermodynamics Analysis of a Novel Absorption Heat Transformer-Driven Combined Refrigeration and Desalination System", *Energy Conversion and Management*, Vol. 277, p. 116597. (DOI: [10.1016/j.enconman.2022.116597](https://doi.org/10.1016/j.enconman.2022.116597))
- [A35] Garg, K., Rathore, A., Yadav, R., Das, S. K., and **Tyagi, H.**, 2022, "Thermodynamic Analysis of the Volumetric Absorption Solar Collector driven Direct Contact Membrane Distillation System", In Press *ASME Journal of Thermal Science and Engineering Applications*. (DOI: [10.1115/1.4053833](https://doi.org/10.1115/1.4053833))

- [A34] Garg, K., Das, S. K., and **Tyagi, H.**, 2022, "Thermal Design of a Humidification-Dehumidification Desalination Cycle consisting of Packed-Bed Humidifier and Finned-Tube Dehumidifier", *International Journal of Heat and Mass Transfer*, Vol. 183, p. 122153. (DOI: [10.1016/j.ijheatmasstransfer.2021.122153](https://doi.org/10.1016/j.ijheatmasstransfer.2021.122153))
- [A33] Kulkarni, V. V., Bhalla, V., Garg, K., and **Tyagi, H.**, 2021, "Hybrid Nanoparticles-laden Fluid based Spiral Solar Collector: A Proof-of-Concept Experimental Study", *Renewable Energy*, Vol. 179, pp. 1360-1369. (DOI: [10.1016/j.renene.2021.07.133](https://doi.org/10.1016/j.renene.2021.07.133))
- [A32] Monga, D., Soni, S., **Tyagi, H.**, and Taylor, R. A., 2020, "Optimization of Tumor Ablation Volume for Nanoparticle-mediated Thermal Therapy", *International Journal of Thermal Sciences*, Vol. 157, p. 106515. (DOI: [10.1016/j.ijthermalsci.2020.106515](https://doi.org/10.1016/j.ijthermalsci.2020.106515))
- [A31] Bhalla, V., Beejawat, S., Doshi, J., Khullar, V., Singh, H., and **Tyagi, H.**, 2020, "Silicone Oil Envelope for Enhancing the Performance of Nanofluid-based Direct Absorption Solar Collectors", *Renewable Energy*, Vol. 145, pp. 2733-2740. (DOI: [10.1016/j.renene.2019.08.024](https://doi.org/10.1016/j.renene.2019.08.024))
- [A30] Li, Q., Beier, L.-J., Tan, J., Brown, C., Lian, B., Wang, Y., Dai, P., Li, T., Le Clech, P., **Tyagi, H.**, Liu, X., Leslie, G., and Taylor, R. A., 2019, "An integrated, solar-driven membrane distillation system for water purification and energy generation", *Applied Energy*, Vol. 237, pp. 534-548. (DOI: [10.1016/j.apenergy.2018.12.069](https://doi.org/10.1016/j.apenergy.2018.12.069))
- [A29] Bhalla, V., Khullar, V., and **Tyagi, H.**, 2019, "Investigation of Factors Influencing the Performance of Nanofluid-based Direct Absorption Solar Collector Using Taguchi Method", *Journal of Thermal Analysis and Calorimetry*, Vol. 135(2), pp. 1493-1505. (DOI: [10.1007/s10973-018-7721-x](https://doi.org/10.1007/s10973-018-7721-x))
- [A28] Garg, K., Khullar, V., Das, S. K., and **Tyagi, H.**, 2019, "Parametric Study of the Energy Efficiency of the HDH Desalination Unit Integrated with Nanofluid-based Solar Collector", *Journal of Thermal Analysis and Calorimetry*, Vol. 135(2), pp. 1465-1478. (DOI: [10.1007/s10973-018-7547-6](https://doi.org/10.1007/s10973-018-7547-6))
- [A27] Prasad, J., Goswami, A., Kumbhani, B., Mishra, C., **Tyagi, H.**, Jun, J. H., Choudhary, K. K., Kumar, M., James, N., Reddy, V. R. S., Singh, S. J., Kashyap, D., Sohoni, M., DasGupta, N., Raina, P. K., Saha, S. K., Mittal, S., Chakraborty, S., and Das, S. K., 2018, "Engineering curriculum development based on education theories", *Current Science*, Vol. 114(9), pp. 1829–1834. (DOI: [10.18520/cs/v114/i09/1829-1834](https://doi.org/10.18520/cs/v114/i09/1829-1834))
- [A26] Salvi, S. S., Bhalla, V., Taylor, R. A., Khullar, V., Otanicar, T. O., Phelan, P. E., and **Tyagi, H.**, 2018, "Technological Advances to Maximize Solar Collector Energy Output: A Review", *ASME Journal of Electronic Packaging*, Vol. 140(4), p. 040802. (DOI: [10.1115/1.4041219](https://doi.org/10.1115/1.4041219))
- [A25] Bhalla, V., Khullar, V., and **Tyagi, H.**, 2018, "Experimental Investigation of Photo-Thermal Analysis of Blended Nanoparticles (Al_2O_3 / Co_3O_4) for Direct Absorption Solar Thermal Collector", *Renewable Energy*, Vol. 123, pp. 616-626. (DOI: [10.1016/j.renene.2018.01.042](https://doi.org/10.1016/j.renene.2018.01.042))
- [A24] Garg, K., Khullar, V., Das, S. K., and **Tyagi, H.**, 2018, "Performance Evaluation of a Brine-Recirculation Multistage Flash Desalination System Coupled with Nanofluid-based Direct Absorption Solar Collector", *Renewable Energy*, Vol. 122, pp. 140-151. (DOI: [10.1016/j.renene.2018.01.050](https://doi.org/10.1016/j.renene.2018.01.050))
- [A23] Khullar, V., **Tyagi, H.**, Otanicar, T. P., Hewakuruppu, Y. L., and Taylor, R. A., 2018, "Solar Selective Volumetric Receivers for Harnessing Solar Thermal Energy", *ASME Journal of Heat Transfer*, Vol. 140(6), p. 062702. (DOI: [10.1115/1.4039214](https://doi.org/10.1115/1.4039214))
- [A22] Bhalla, V., and **Tyagi, H.**, 2018, "Parameters Influencing the Performance of Nanoparticles-laden Fluid-based Solar Thermal Collectors: A Review on Optical Properties", *Renewable & Sustainable Energy Reviews*, Vol. 84, pp. 12–42. (DOI: [10.1016/j.rser.2017.12.007](https://doi.org/10.1016/j.rser.2017.12.007))

- [A21] Khullar, V., Bhalla, V., and **Tyagi, H.**, 2018, "Potential Heat Transfer Fluids (Nanofluids) for Direct Volumetric Absorption-Based Solar Thermal Systems", *ASME Journal of Thermal Science and Engineering Applications*, Vol. 10(1), p. 011009. (DOI: [10.1115/1.4036795](https://doi.org/10.1115/1.4036795))
- [A20] Bhalla, V., and **Tyagi, H.**, 2017, "Solar Energy Harvesting by Cobalt Oxide Nanoparticles, A Nanofluid Absorption Based System", *Sustainable Energy Technologies and Assessments*, Vol. 24, pp. 45–54. (DOI: [10.1016/j.seta.2017.01.011](https://doi.org/10.1016/j.seta.2017.01.011))
- [A19] Patel, A., Sarkar, P., **Tyagi, H.**, and Singh, H., 2016, "Time Value of Emission and Technology Discounting Rate for Off-Grid Electricity Generation in India using Intermediate Pyrolysis", *Environmental Impact Assessment Review*, Vol. 59, pp. 10–26. (DOI: [10.1016/j.eiar.2016.03.001](https://doi.org/10.1016/j.eiar.2016.03.001))
- [A18] Soni, S., **Tyagi, H.**, Taylor, R. A., and Kumar, A., 2015, "Experimental and Numerical Investigation of Heat Confinement During Nanoparticle-Assisted Thermal Therapy", *International Communications in Heat and Mass Transfer*, Vol. 69, pp. 11-17. (DOI: [10.1016/j.icheatmasstransfer.2015.10.001](https://doi.org/10.1016/j.icheatmasstransfer.2015.10.001))
- [A17] Soni, S., **Tyagi, H.**, Taylor, R. A., and Kumar, A., 2015, "The Influence of Tumour Blood Perfusion Variability on Thermal Damage During Nanoparticle-Assisted Thermal Therapy", *International Journal of Hyperthermia*, Vol. 31(6), pp. 615-625. (DOI: [10.3109/02656736.2015.1040470](https://doi.org/10.3109/02656736.2015.1040470))
- [A16] Saroha, S., Mittal, T., Modi, P. J., Bhalla, V., Khullar, V., **Tyagi, H.**, Taylor, R. A., and Otanicar, T. P., 2015, "Theoretical Analysis and Testing of Nanofluids-Based Solar Photovoltaic/Thermal (PV/T) Hybrid Collector", *ASME Journal of Heat Transfer*, Vol. 137(9), p. 091015. (DOI: [10.1115/1.4030228](https://doi.org/10.1115/1.4030228))
- [A15] Hewakuruppu, Y., Taylor, R. A., **Tyagi, H.**, Khullar, V., Otanicar, T. P., Coulombe, S., and Hordy, N., 2015, "Limits of selectivity of direct volumetric solar absorption", *Solar Energy*, Vol. 114, pp. 206-216. (DOI: [10.1016/j.solener.2015.01.043](https://doi.org/10.1016/j.solener.2015.01.043))
- [A14] Otanicar, T. P., Theisen, S., Norman, T., **Tyagi, H.**, and Taylor, R. A., 2015, "Envisioning advanced solar electricity generation: Parametric studies of CPV/T systems with spectral filtering and high temperature PV", *Applied Energy*, Vol. 140, pp. 224-233. (DOI: [10.1016/j.apenergy.2014.11.073](https://doi.org/10.1016/j.apenergy.2014.11.073))
- [A13] Khullar, V., **Tyagi, H.**, Hordy, N., Otanicar, T., Hewakuruppu, Y., Modi, P., and Taylor, R. A., 2014, "Harvesting solar thermal energy through nanofluid-based volumetric absorption systems", *International Journal of Heat and Mass Transfer*, Vol. 77, pp. 377-384. (DOI: [10.1016/j.ijheatmasstransfer.2014.05.023](https://doi.org/10.1016/j.ijheatmasstransfer.2014.05.023))
- [A12] Soni, S., **Tyagi, H.**, Taylor, R. A., and Kumar, A., 2014, "Investigation on nanoparticle distribution for thermal ablation of a tumour subjected to nanoparticle assisted thermal therapy", *Journal of Thermal Biology*, Vol. 43, pp. 70-80. (DOI: [10.1016/j.jtherbio.2014.05.003](https://doi.org/10.1016/j.jtherbio.2014.05.003))
- [A11] Gulati, R., Reddy, A., Khullar, V., Bhalla, V., **Tyagi, H.**, Zhao, Y., Law, E., and Taylor, R. A., 2013, "Enhancing the efficiency of absorption refrigeration cycle by seeding nanoparticles directly in the working fluid", *International Journal of Environmental Studies*, Vol. 70(5), pp. 808-823. (DOI: [10.1080/00207233.2013.798503](https://doi.org/10.1080/00207233.2013.798503))
- [A10] Phelan, P., Otanicar, T., Taylor, R., and **Tyagi, H.**, 2013, "Trends and Opportunities in Direct-Absorption Solar Thermal Collectors", *ASME Journal of Thermal Science and Engineering Applications*, Vol. 5(2), p. 021003. (DOI: [10.1115/1.4023930](https://doi.org/10.1115/1.4023930))
- [A09] Soni, S., **Tyagi, H.**, Taylor, R. A., and Kumar, A., 2013, "Role of Optical Coefficients and Healthy Tissue Sparing Characteristics in Gold Nanorod Assisted Thermal Therapy", *International Journal of Hyperthermia*, Vol. 29(1), pp. 87-97. (DOI: [10.3109/02656736.2012.753162](https://doi.org/10.3109/02656736.2012.753162))

- [A08] Taylor, R., Coulombe, S., Otanicar, T., Phelan, P., Gunawan, A., Lv, W., Rosengarten, G., Prasher, R., and **Tyagi, H.**, 2013, "Small Particles, Big Impacts: A Review of the Diverse Applications of Nanofluids", *Journal of Applied Physics*, Vol. 113(1), p. 011301. **[Invited and Appeared on the cover of the Journal of Applied Physics]** (DOI: [10.1063/1.4754271](https://doi.org/10.1063/1.4754271))
- [A07] Khullar, V., **Tyagi, H.**, Phelan, P. E., Otanicar, T. P., Singh, H., and Taylor, R. A., 2012, "Solar Energy Harvesting Using Nanofluids-Based Concentrating Solar Collector", *ASME Journal of Nanotechnology in Engineering and Medicine*, Vol. 3(3), p. 031003. (DOI: [10.1115/1.4007387](https://doi.org/10.1115/1.4007387))
- [A06] Khullar, V. and **Tyagi, H.**, 2012, "A Study on Environmental Impact of Nanofluid-Based Concentrating Solar Water Heating System", *International Journal of Environmental Studies*, Vol. 69(2), pp. 220-232. (DOI: [10.1080/00207233.2012.663227](https://doi.org/10.1080/00207233.2012.663227))
- [A05] Otanicar, T. P., Phelan, P. E., Taylor, R. A., and **Tyagi, H.**, 2011, "Spatially Varying Extinction Coefficient for Direct Absorption Solar Thermal Collector Optimization", *ASME Journal of Solar Energy Engineering*, Vol. 133(2), p. 024501. (DOI: [10.1115/1.4003679](https://doi.org/10.1115/1.4003679))
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- [A03] **Tyagi, H.**, Phelan, P. E., and Prasher, R., 2009, "Predicted Efficiency of a Low-Temperature Nanofluid-Based Direct Absorption Solar Collector", *ASME Journal of Solar Energy Engineering*, Vol. 131(4), p. 041004. **[Appeared in 'Top 10 most downloaded papers' of the journal during Oct 2009 and Nov 2009]** (DOI: [10.1115/1.3197562](https://doi.org/10.1115/1.3197562))
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- [D62] Singh, D., Kashyap, A. S., Samanta, D., and **Tyagi, H.**, "Heat and Mass Transfer Analysis in Direct Contact and Photothermal Membrane Distillation", Paper No. IHMTC-2025-021, *Proceedings of the 28th National and 6th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2025)*, IIT Jodhpur, Jodhpur, Rajasthan, India, Dec. 9-12, 2025.
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- [D57] Dwivedi, J., Chauhan, K. S., and **Tyagi, H.**, "Solar Energy Integration in Direct Contact Membrane Distillation for Clean Water Production", Paper No. TFEC-2024-50415, *ASTFE 9th Thermal and Fluids Engineering Conference (TFEC)*, Oregon State University, Corvallis, OR, USA, April 21-24, 2024. (doi: <https://doi.org/10.1615/TFEC2024.icp.050415>).
- [D56] Kashyap, A. S., Bhalla, V., and **Tyagi, H.**, "A Comparative Experimental Investigation on Charging and Discharging of Paraffin Wax PCM with Surface and Volume Heating Approach", Paper No. ENFHT2024-263, *Proceedings of the 9th International Conference on Experimental and Numerical Flow and Heat Transfer (ENFHT 2024)*, Imperial College London, London, U. K., April 11-13, 2024. (doi: <https://doi.org/10.11159/enfht24.263>)

- [D55] Beniwal, R., and **Tyagi, H.**, "Thermodynamic Analysis of Desiccant based Air Conditioning System", Paper No. IHMTC2023-137, *Proceedings of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2023)*, IIT Patna, Patna, Bihar, India, Dec. 14-17, 2023.
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- [D02] **Tyagi, H.**, and Ting, D. S.-K., "A Note on Premixed Flame-Turbulence Interactions", Paper No. 2005-01-0241, *SAE World Congress*, Detroit, Michigan, USA, Apr. 11-14, 2005. (DOI: [10.4271/2005-01-0241](https://doi.org/10.4271/2005-01-0241))
- [D01] **Tyagi, H.**, Liu, R., Ting, D. S.-K., and Johnston, C. R., "Experimental Investigation of Perforated Plate Turbulent Flow past a Solid Sphere", Paper No. IMECE2004-60340, *ASME International Mechanical Engineering Congress and Exposition*, Anaheim, California, USA, Nov. 13-19, 2004. (DOI: [10.1115/IMECE2004-60340](https://doi.org/10.1115/IMECE2004-60340))

(E) Extended Abstracts, Oral Presentations (Posters and Papers)

- [E32] Yadav, K., Agrawal, M., and **Tyagi, H.**, "Thermal Management of Li-Ion Battery using Effective Cooling System", *Proceedings of the 9th International Conference on Sustainable Energy and Environmental Challenges (IX SEEC)*, IIT Mandi, Himachal Pradesh, India, Dec. 13-15, 2024.
- [E31] Dwivedi, J., Chauhan, K. S., Beniwal, R., Kashyap, A. S., and **Tyagi, H.**, "Applications of Solar Energy: Energy Storage, Cooling, and Water Desalination", *Brightening Tomorrow Together 2024*, University of Windsor, Windsor, Ontario, Canada, June 20-21, 2024.
- [E30] Gatadi, B. P., Kaur, D., Dahiya, R., Zhang, X., **Tyagi, H.**, Suzuki, M., Kumar, M., "Anomalous shift from negative photocurrent to positive photocurrent in FeSi₂/Ga₂O₃ heterostructure based solar-blind Photodetectors", *International Conference on Functional Materials (ICFM2024)*, IIT Kharagpur, West Bengal, India, January 9-11, 2024.
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- [E28] Kulkarni, V., Makauskas, P., Pal, M., Kashyap, A. S., and **Tyagi, H.**, "Comparative Study of Numerical Modelling of Heat Absorption and Conduction in a Flat Plate Solar Collector with Porous Foam", Paper No. 74, *2022 Annual Conference of the UK Association for Computational Mechanics (UKACM 2022)*, University of Nottingham, Nottingham, UK, Apr. 20-22, 2022.
- [E27] Garg, K., Bhalla, V., Khullar, V., Das, S. K., and **Tyagi, H.**, "Thermodynamic analysis of the solar-energy driven HDH desalination system consisting of packed bed humidifier and dehumidifier", *International Conference on Sustainable Technologies for Desalination & National Water Mission and Annual Congress of Indian Desalination Association (InDACON-2020)*, Ahmedabad, India, Feb. 13-15, 2020.
- [E26] Trivedi, H., and **Tyagi, H.**, "Optimizing solar energy irradiance by using solar cells in three dimension", *7th International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering (AFTMME-2019)*, IIT Ropar, Rupnagar, India, Dec. 05-07, 2019.
- [E25] Rathore, A., Yadav, R., and **Tyagi, H.**, "Numerical Study of Direct Contact Membrane Distillation Technique Coupled with Nanofluid-Based Direct Absorption Solar Collector", Paper No. SEEC-126, *Third International Conference on Sustainable Energy and Environmental Challenges (3rd SEEC)*, IIT Roorkee, Uttarakhand, India, Dec. 18-21, 2018.
- [E24] Patil, P., Salvi, S. S., Bhalla, B., and **Tyagi, H.**, "Solar Thermal Energy Storage Using PCM (Phase Change Materials)", *Conference on Carbon Capture and Its Utilization (CCU-2018)*, CSIR-National Chemical Laboratory, Pune, India, Dec. 14-15, 2018.
- [E23] Monga, D., Soni, S., and **Tyagi, H.**, "Gold Nanospheres as Photothermal Agents in Nanoparticle Assisted Thermal Therapy", Poster No. ISFM-1114, *International Symposium on Functional Materials (IFSM-2018): Energy and Biomedical Applications*, Chandigarh, India, Apr. 13-15, 2018.
- [E22] Garg, K., Bhalla, V., Salvi, S. S., Khullar, V., Das, S. K., and **Tyagi, H.**, "Numerical Study of Direct Absorption Solar Collector Based Brine Recirculation Multistage Flash Desalination System for Small Scale Applications", Poster No. ISFM-1137, *International Symposium on Functional Materials (IFSM-2018): Energy and Biomedical Applications*, Chandigarh, India, Apr. 13-15, 2018.
- [E21] Salvi, S. S., Garg, K., Bhalla, V., Khullar, V., and **Tyagi, H.**, "Numerical Modelling of Phase Change Material incorporated Brick Wall as a Thermal Energy Storage: Building's Energy Efficiency Applications", Poster No. ISFM-1143, *International Symposium on Functional Materials (IFSM-2018): Energy and Biomedical Applications*, Chandigarh, India, Apr. 13-15, 2018.

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- [E19] Salvi, S. S., Khullar, V., and **Tyagi, H.**, "Numerical Modelling of Solar Thermal Energy Storage with Phase Change Materials", Paper No. SEEC-2018-026, *Second International Conference on Sustainable Energy and Environmental Challenges (SEEC-2018)*, Indian Institute of Science (IISc), Bangalore, India, Jan. 01-03, 2018.
- [E18] Bhalla, V., Garg, K., Salvi, S. S., Badarla, V., Fulwani, D., Khullar, V., Rao, M. M., Chakrapani, A., Krishnan, N., and **Tyagi, H.**, "Utilization of Nanoparticle-Based Solar Energy Systems for Improving the Overall Energy Efficiency of Buildings", Paper No. SEEC-2018-146, *Second International Conference on Sustainable Energy and Environmental Challenges (SEEC-2018)*, Indian Institute of Science (IISc), Bangalore, India, Jan. 01-03, 2018.
- [E17] Bhalla, V., Khullar, V., Singh, H., and **Tyagi, H.**, "Liquid Layer Envelope for Curbing Radiative Losses in Nanofluid-Based Volumetric Receivers", *SOLARIS 2017 International Conference*, Brunel University London, London, U.K., Jul. 27-28, 2017.
- [E16] Garg, K., Bhalla, V., Khullar, V., Das, S. K., and **Tyagi, H.**, "Numerical Study of Multi-Stage Flash Desalination Method Coupled with Nano-Fluid based Direct Absorption Solar Collector", *SOLARIS 2017 International Conference*, Brunel University London, London, U.K., Jul. 27-28, 2017.
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- [E14] Garg, K., Khullar, V., **Tyagi, H.**, and Das, S. K., "Numerical Study of Single Stage Flash Evaporation Desalination Technique Coupled with Nano-Fluid Based Direct Absorption Solar Collector", Paper No. SEEC-2017-005, *International Conference on Sustainable Energy and Environmental Challenges (SEEC-2017)*, Mohali, India, Feb. 26-28, 2017.
- [E13] Patel, A. R., **Tyagi, H.**, Sarkar, P., and Singh, H., "Sustainable Energy Assessment Criteria of Intermediate Pyrolysis of Wheat Straw as A Renewable Energy Alternate", Paper No. SEEC-2017-126, *International Conference on Sustainable Energy and Environmental Challenges (SEEC-2017)*, Mohali, India, Feb. 26-28, 2017.
- [E12] Phelan, P. E., Abdelaziz, O., Otanicar, T., Phelan, B. E., Prasher, R. S., Taylor, R. A., and **Tyagi, H.**, "A Framework to Quantify the Impact of Thermal Engineering Research on Global Climate Change", Paper No. PowerEnergy2015-49137, *ASME 2015 9th International Conference on Energy Sustainability*, San Diego, California, USA, Jun. 28 - Jul. 2, 2015.
- [E11] Bhalla, V., Khullar, K., and **Tyagi, H.**, "Enhancement in optical properties of heat transfer fluid by using nanoparticles", *5th International and 41st National Conference on Fluid Mechanics and Fluid Power*, IIT Kanpur, Kanpur, India, Dec. 12-14, 2014.
- [E10] Hewakuruppu, Y. L., Taylor, R. A., **Tyagi, H.**, and Otanicar, T., "Limits of nanofluid based direct absorption solar collection", *Australian Solar Council Conference 2014*, Melbourne, Australia, May 8-9, 2014.
- [E09] Soni, S., **Tyagi, H.**, and Kumar, A., "Optical Coefficients of Gold Nanorod Embedded Tissue – Variant Parameters", *Photonics 2012 - International Conference on Fiber Optics and Photonics*, IIT Madras, Chennai, India, Dec. 9-12, 2012. (DOI: [10.1364/PHOTONICS.2012.TPo.25](https://doi.org/10.1364/PHOTONICS.2012.TPo.25))
- [E08] Zhao, Y., Vishwakarma, V., Law, E., Reddy, A., Taylor, R. and **Tyagi, H.**, "Nanofluid Based Concentrating Solar Absorption Radiant Cooling System for Subtropical Regions", *Australian Solar*

Energy Society 50th Annual Conference (AuSES), Swinburne University of Technology, Hawthorn Campus, Melbourne, Australia, Dec. 6-7, 2012.

- [E07] Soni, S., Kumar, A., and **Tyagi, H.**, "Plasmonics Instrumentation – A New Era for the Cancer Therapeutics", *National Symposium on Instrumentation (NSI-37)*, CSIO, Chandigarh, India, Oct. 30 - Nov. 01, 2012.
- [E06] Soni, S., **Tyagi, H.**, Taylor, R. A., and Kumar, A., "Numerical Analysis of Nanoparticle Distribution in a Tumor following Intramuscular Injection of Nanofluid", *International Conference on Frontiers of Nanoscience, Nanotechnology and Their Applications (NanoSciTech-2012)*, Punjab University, Chandigarh, India, Feb. 16-18, 2012.
- [E05] Soni, S., Kumar, A., and **Tyagi, H.**, "Numerical Analysis of Nanoparticle Distribution in a Tumor and its Effect on Enhanced Hyperthermia", Poster No. P-63, *International Conference on Nano Sensors and Technology*, CSIO, Chandigarh, India, Oct. 28-30, 2010.
- [E04] Khullar, V., and **Tyagi, H.**, "Utilization of Nanofluids in Harvesting Radiant Energy", Poster No. P-72, *International Conference on Nano Sensors and Technology*, CSIO, Chandigarh, India, Oct. 28-30, 2010.
- [E03] **Tyagi, H.**, Phelan, P. E., Prasher, R., Peck, P., Lee, T. W., Pacheco, J. R., and Arentzen, P., "Experimental Study of the Ignition Properties of Diesel Containing Nano-Sized Aluminum Particles", Paper No. IMECE2007-43449, *ASME International Mechanical Engineering Congress and Exposition*, Seattle, Washington, USA, Nov. 11-15, 2007.
- [E02] **Tyagi, H.**, Phelan, P. E., Prasher, R., Peck, P., Lee, T. W., Pacheco, J. R., and Arentzen, P., "Enhancement in Ignition Properties of Liquid Fuels by Adding Nano-sized Particles", *Nanofluids: Fundamentals and Applications*, Copper Mountain, Colorado, USA, Sep. 16-20, 2007.
- [E01] **Tyagi, H.**, Liu, R., and Ting, D. S.-K., "The Characteristics of Sphere Wake in Freestream Turbulent Flow", *APS Annual Meeting of the Division of Fluid Dynamics*, Chicago, Illinois, USA, Nov. 20-22, 2005.

(F) Online Articles

- [F01] **Tyagi, H.**, *Solar Air Heaters*, Thermopedia, Begell House Inc, Oct. 2024. (doi: <https://dx.doi.org/10.1615/thermopedia.010439>).

PATENTS

- [P02] Patel, A., Sarkar, P., **Tyagi, H.**, Singh, H., *System and Method for Tracking Details of Energy Associated with an Energy Generation Process*, Indian Patent No. 529279 (**Patent Granted**), Application No. 202011012620, Filing date: 23-Mar-2020, Name of applicant: IIT Ropar.
- [P01] Patel, A., Sarkar, P., **Tyagi, H.**, Singh, H., *A Method for Determining a Single Emission Discounting Rate for Processes Involving Environmental Emissions*, Indian Patent No. 420086 (**Patent Granted**), Application No. 201811044462, Filing date: 26-Nov-2018, Name of applicant: IIT Ropar.

LECTURES RECORDED ON SWAYAMPARBHA (INDIA)

Recorded 40 lectures on the subject of 'Heat and Mass Transfer' for Channel 17 of the Swayam Prabha DTH educational program, at IIT Kanpur, India. These lectures were telecast on Swayam Prabha DTH in India during 2019-20. All these lectures are now available as the following playlist on YouTube:

<https://www.youtube.com/playlist?list=PL5vgJ1-TTYyl44nJ3StxL-b0D3UjWoFK->

ADMINISTRATIVE RESPONSIBILITIES / SERVICES

- Chairperson of Academic Planning Committee, at Department of Mechanical Engineering, IIT Ropar, India (2022-24).
- Member of Resource Generation and Planning Committee (RGPC) at Department of Mechanical Engineering, IIT Ropar, India (2021-24).
- Chairman, Institute Visitor Hostel (Guesthouse) Committee, IIT Ropar, India (2021-23).
- Member, Hindi OLIC (Official Language Implementation Committee), IIT Ropar, India (2019-present).
- Faculty Advisor for 2019ME batch MTech students, IIT Ropar, India (2019-2021).
- Associate Dean, Academics (UG) at Indian Institute of Technology Ropar, India (2015-2017).
- Member of Senate at Indian Institute of Technology Ropar, India (2014-2021).
- Coordinator, UG Programme [Academics] at Indian Institute of Technology Ropar, India (2014-2015).
- Center for Innovation and Business Incubation (CIBI) Governing Board member at Indian Institute of Technology Ropar, India (2013-2016).
- Academic Committee for Undergraduate Studies (ACUGS) member at Indian Institute of Technology Ropar, India (2012-2017).
- B.Tech Project (BTP) Coordinator for SMME for the year 2013-14 at Indian Institute of Technology Ropar, India.
- Faculty Advisor for 2010ME batch students at Indian Institute of Technology Ropar, India (2010-2014).
- Chairman of Air Conditioning and Refrigeration Committee at Indian Institute of Technology Ropar, India (2010-2014).
- Faculty In-charge of Sports Activities at Indian Institute of Technology Ropar, India (2009-2014).
- Member of several other institute and department level committees at Indian Institute of Technology Ropar, India.
- Chaired technical sessions/tracks during the following conferences/symposiums:
 - Session co-chair: *8th Cleaner Earth & Atmosphere Conference*, University of Windsor, Canada, June 2025
 - Session chair: *26th National & 4th Intl. ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2021)*, IIT Madras, India, December 2021 (online)
 - Session co-chair: *9th Intl. Conference on Advancements and Futuristic Trends in Mechanical & Materials Engineering (AFTMME)*, IIT Ropar, India, December 2021 (online)
 - Session co-chair: *6th Intl. Conference on Sustainable Energy and Environmental Challenges (VI SEEC)*, Lucknow, Uttar Pradesh, India, December 2021 (online)

- Session chair: *8th Intl. & 47th National Conference on Fluid Mechanics and Fluid Power (FMFP)*, IIT Guwahati, India, December 2020 (online)
 - Session chair: *5th Intl. Conference on Sustainable Energy and Environmental Challenges (5th SEEC)*, India, December 2020 (online)
 - Session chair: *7th Intl. & 9th National Conference on Advancements and Futuristic Trends in Mechanical & Materials Engineering (AFTMME)*, IIT Ropar, India, December 2019
 - Session chair: *7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP)*, IIT Bombay, India, December 2018
 - Session chair: *Third International Conference on Sustainable Energy and Environmental Challenges (3rd SEEC)*, IIT Roorkee, India, December 2018
 - Session chair: *5th International Conference on Computational Methods for Thermal Problems (ThermaComp2018)*, Indian Institute of Science (IISc), Bangalore, India, July 2018
 - Session co-chair: *Ninth National Frontiers of Engineering Symposium (9NatFoE) for Young Indian Engineers*, Indian National Academy of Engineering (INAE), IIT Jodhpur, India, June 2015
 - Session chair: *International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering*, Punjab Technical University, Jalandhar, India, October 2013
- Reviewed research project/workshop funding proposals from the following agencies:
 - *ANRF (Anusandhan National Research Foundation, Department of Science and Technology), India*
 - *CPRI (Central Power Research Institute, Ministry of Power, Govt. of India)*
 - *DSIR (Department of Scientific and Industrial Research), Govt. of India*
 - *DST-SERB (Science and Engineering Research Board, Department of Science and Technology), India*
 - *Global Innovation & Technology Alliance (GITA), DST, Govt. of India*
 - *IUSSTF (Indo-U.S. Science and Technology Forum), India*
 - *KFUPM (King Fahd University of Petroleum & Minerals), Saudi Arabia*
 - *MITACS, Canada*
 - *MNRE (Ministry of New & Renewable Energy, Govt. of India)*
 - *Prime Minister's Research Fellows (PMRF) Scheme, India*
 - Reviewed books and manuscripts for the following publishers/conferences/journals:
 - (a) Books**
 - AIP Publishing, Cambridge University Press, Elsevier Books, IET - Institution of Engineering and Technology, IOP Publishing, Springer Books, Wiley Books
 - (b) Conferences**
 - ASME International Mechanical Engineering Congress and Exposition, ASME InterPACK Conference, ASME Micro/Nano Scale Heat and Mass Transfer Conference, Energy &

Sustainability Symposium, Fluid Mechanics and Fluid Power (FMFP) Conference, IEEE iTherm Conference, International Conference on Modelling, Simulation and Optimization (CoMSO), International Heat Transfer Conference (IHTC), ISES (International Solar Energy Society) Solar World Congress, ISHMT-ASME Heat and Mass Transfer Conference, ISHMT-ASTFE Heat and Mass Transfer Conference

(c) Journals

ACS Applied Energy Materials, Acta Astronautica, Applied Energy, Applied Mathematical Modelling, Applied Thermal Engineering, ASME Applied Mechanics Reviews, ASME Journal of Fluid Engineering, ASME Journal of Heat Transfer, ASME Journal of Manufacturing Science and Engineering, ASME Journal of Solar Energy Engineering, ASME Journal of Thermal Science and Engineering Applications, Case Studies in Thermal Engineering, Canadian Journal of Chemical Engineering, Chemical Engineering Research and Design, Chemical Engineering Science, Chemical Physics Letters, Computational Thermal Sciences, Desalination, Electronics Letters, Energy, Energy and Buildings, Energy Conversion and Management, Environmental Science and Pollution Research, Environmental Science: Water Research & Technology, ES Energy & Environment, Experimental Thermal and Fluid Science, Fuel, Heat Transfer Engineering, Heat Transfer Research, IEEE Access, IEEE Sensors Journal, IEEE Transactions on Components, Packaging and Manufacturing Technology, IEEE Transactions on Nanotechnology, IEEE Transactions on NanoBioscience, IEEE Transactions on Nanotechnology, Indian Journal of Pure & Applied Physics, International Communications in Heat and Mass Transfer, International Journal of Ambient Energy, International Journal of Environmental Studies, International Journal of Green Energy, International Journal of Heat and Mass Transfer, International Journal of Low-Carbon Technologies, International Journal of Nanomedicine, International Journal of Thermal Sciences, International Journal of Thermofluids, International Journal of Thermophysics, International Journal of Turbo & Jet Engines, Journal of Applied Physics, Journal of Energy Institute, Journal of Enhanced Heat Transfer, Journal of Flow Visualization & Image Processing, Journal of Laser Applications, Journal of Materials Chemistry A, Journal of Materials Science, Journal of Mathematics and Statistics, Journal of Renewable and Sustainable Energy, Journal of Thermal Analysis and Calorimetry, Journal of Thermal Biology, Journal of Thermophysics and Heat Transfer, Materials Science and Engineering B, Medical & Biological Engineering & Computing, Nano Energy and Nano Environment, Nanoscale and Microscale Thermophysical Engineering, National Academy Science Letters, Nature Scientific Reports, Neural Computing and Applications, Numerical Heat Transfer, Part A: Applications, Optical and Quantum Electronics, Physical Chemistry Chemical Physics, Physics of Fluids, Polymer Testing, Proceedings of the National Academy of Sciences, India Section A: Physical Sciences, Renewable Energy, Results in Engineering, RSC Advances, Sadhana - Academy Proceedings in Engineering Sciences, Sensors and Actuators A: Physical, Separation and Purification Technology, Solar Energy, Solar Energy Materials & Solar Cells, Sustainable Energy Technologies and Assessments, Thermal Science and Engineering Progress, Transactions of the Indian Institute of Metals, Transport in Porous Media, Vacuum, Water and Environment Journal, Waves in Random and Complex Media

- Duties as External Examiner: Examined PhD Thesis for PhD scholar from the following institutes
 - Australia: The University of Queensland
 - Canada: York University

- India: AcSIR CSIR (Academy of Scientific & Innovative Research), BITS Pilani, IISc Bangalore, IIT BHU Varanasi, IIT Bombay, IIT Delhi, IIT Hyderabad, IIT Jodhpur, IIT Madras, IIT Roorkee, NIT Hamirpur, NIT Jalandhar, NIT Jamshedpur, NIT Trichy

ACCOMPLISHMENTS AND HONOURS

- Recipient of the **Prof. Y. V. N. Rao Best Paper Award** for the paper titled "Numerical Study of Nanoparticle Injection in Tumors for Nanoparticle-assisted Hyperthermia", at the *8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP)*, IIT Guwahati, Assam, India, Dec 2020.
- Recipient of the **International Travel Award** awarded by the Department of Science and Technology (DST-SERB), Govt. of India, for attending ASME MNHMT Conference held at Singapore, Jan 2016.
- Recipient of **Indo-US Science and Technology Forum (IUSSTF)** grant awarded for organizing an Indo-US Workshop on "*Recent Advances in Micro/Nanoscale Heat Transfer and Applications in Clean Energy Technologies*" at IIT Ropar, India during Dec 2013.
- Recipient of **Travel Fellowship** awarded by Centre for International Co-operation in Science (CICS), for attending the ASME MNHMT Conference held at Hong Kong, China, Dec 2013.
- Delivered as **Guest of Honor** the inaugural lecture on "Technology Advances in Sustainable Energy Applications" during the 'Short Term Training Programme on Solar Energy and its Applications' (STTP-SEA) at MANIT Bhopal, India, Jun 2013.
- Recipient of the **International Travel Award** awarded by the Department of Science and Technology (DST), Govt. of India, for attending ASME MNHMT Conference held at Atlanta, GA, USA, Mar 2012.
- Recipient of the **Best Paper Award** for the paper titled "Predicted Efficiency of a Nanofluid-Based Direct Absorption Solar Receiver", awarded by ASME Solar Energy Division at *Energy Sustainability 2007 Conference*, Long Beach, CA, USA, Jun 2007.
- Recipient of **Two Travel Grant Awards**, awarded by the Division of Graduate Studies at Arizona State University, USA for attending conferences in Jun 2007 and Nov 2008.
- Recipient of '**International Graduate Student Scholarship**' at University of Windsor, Canada, Mar 2005.
- Adjudicated '**Best Project** of the year' for the work titled "Design Conceptualization in 3-D Environment", amongst 23 teams of graduate engineer trainees in Siemens Ltd., India, Aug 2002.
- Recipient of **Roll of Honor** at Nilgiri House, IIT Delhi, India, 2001.
- Recipient of Summer Undergraduate Research Award (**SURA**), IIT Delhi, India, May 1999.
- Ranked within the top **0.2%** of the candidates (around 0.25 million), who appeared for the Joint Entrance Examination (JEE - 1997) conducted by the six IITs for entrance to the undergraduate B.Tech Programs, with an All India Rank (AIR) of 431.
- Top Ranker (**1st Position**) in the State Level RMO (Regional Math Olympiad), 1996, India.
- Recipient of the prestigious National Talent Search Examination (NTSE) Scholarship for the duration 1995-2001, being selected amongst the top **750 candidates** throughout the country, India.

INVITED TALKS AND PRESENTATIONS

- Developments & Future Directions in Clean Energy Applications, at the School of Mechanical Engineering, Vellore Institute of Technology (VIT) Chennai Campus, India, 2024 (online).
- Applications of Heat Transfer: Solar Thermal Energy, Water Desalination, at *York University*, York, Ontario, Canada, 2024.
- Thermal Aspects of Clean Energy-based Applications, at *Shiv Nadar Institution of Eminence*, Delhi NCR, Greater Noida, India, 2023.
- Trends & Developments in Thermo-Fluids Engineering: Illustrations & Examples, at the Department of Mechanical Engineering, *Thapar Institute of Engineering and Technology*, Patiala, Punjab, India, 2023.
- Thermal Analysis of Renewable & Solar Energy Technologies, during the Faculty Development Program on Recent Trends in Renewable Energy systems, at Department of Electrical Engineering, *JSPM's Rajarshi Shahu College of Engineering*, Pune, India, 2023 (online).
- Applications of Heat Transfer: Solar Energy and Water Purification, during the department seminar series, at the Department of Mechanical Engineering, *Indian Institute of Technology Kanpur*, Uttar Pradesh, India, 2022 (online).
- Radiative Heat Transfer Applications: Solar Thermal Collector, during the international e-Workshop on Radiation Transport and Applications, at *Indian Institute of Technology Bhubaneswar*, Odisha, India, 2022 (online).
- Role of Thermal Engineering in Improving Efficiencies of Solar Energy and Water Purification Processes, during the department seminar series, at the *Department of Mechanical & Aerospace Engineering, University of Texas at Arlington*, Arlington, Texas, USA, 2021 (online).
- The Use of Technology in Education: Present Roles and Future Prospects, delivered at *IIT Ropar*, Rupnagar, Punjab, India, 2021 (online).
- Applications of Solar Energy Technologies, during the National Training Programme on Renewable Energy, at *Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE)*, Kapurthala, Punjab, India, 2021 (online).
- Applications of Heat Transfer: Use of Nanoparticles in Harnessing Solar Energy, during the International Winter School on 'Fluid Dynamics, Heat Transfer and Applications', *National Institute of Technology Uttarakhand*, Garhwal, Uttarakhand, India, 2021 (online).
- Developments in Solar Energy & Water Purification Technologies, during the *8th International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering (AFTMME 2020)*, India, 2020 (online).
- Challenges Faced by Societies: Energy & Water, during the Webinar series on "Sustainable Energy & Environmental Issues and Solutions", at the *Centre of Excellence in Energy Science & Technology (CEEST), Shoolini University*, Solan, Himachal Pradesh, India, 2020 (online).
- Applications of Solar Thermal Systems: Water Desalination, during the Faculty Development Programme Under AICTE Training & Learning (ATAL) Academy on 'Challenges and Opportunities in Collection, Storage and Utilization of Solar Thermal Energy' (COCSUSTE-20), at *Dr. B. R. Ambedkar National Institute of Technology*, Jalandhar, Punjab, India, 2020 (online).
- Solar Thermal Systems: Role of Heat Transfer, during the Faculty Development Programme Under AICTE Training & Learning (ATAL) Academy on 'Challenges and Opportunities in Collection, Storage and Utilization of Solar Thermal Energy' (COCSUSTE-20), at *Dr. B. R. Ambedkar National Institute of Technology*, Jalandhar, Punjab, India, 2020 (online).

- Advances in Solar Energy and Water Desalination Processes, during the 7th International & 9th Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering (AFTMME), at *Indian Institute of Technology Ropar*, Rupnagar, Punjab, India, 2019.
- Sustainable Energy Application: Water Purification, during the Third International Conference on Sustainable Energy and Environmental Challenges (3rd SEEC), at *Indian Institute of Technology Roorkee*, Roorkee, Uttarakhand, India, 2018.
- Water Purification Using Solar Energy, during the workshop on 'Frontiers in Solar Technologies' (FST-2018), at *NIT Silchar*, Assam, India, 2018.
- Solar Energy: The Future of Clean Energy, during the workshop on 'Frontiers in Solar Technologies' (FST-2018), at *NIT Silchar*, Assam, India, 2018.
- Developments in Renewable Energy & Water Desalination Technologies, during the Short Term Course on 'Sustainable Renewable Energy: Science, Technology and Development' at *U.I.E.T, Kurukshetra University*, India, 2018.
- Use of Nanoparticles for Harnessing Solar Thermal Energy and Applications in Energy Efficient Buildings, during the Second International Conference on Sustainable Energy and Environmental Challenges (SEEC - 2018) held at *Indian Institute of Science (IISc)*, Bangalore, Karnataka, India, 2018.
- Harvesting Solar Thermal Energy Using Nanotechnology, during the National Conference on Large Solar Power Generation - Challenges and Adequate Technology Solutions held at *National Power Training Institute (NPTI)*, Nangal, Punjab, India, 2017.
- Advances in Nanotechnology: Clean and Sustainable Energy Resources, during the International Conference on Advancements and Futuristic Trends in Mechanical & Materials Engineering (AFTMME-2017) held at *Shaheed Udham Singh College of Engineering and Technology*, Tangori (Mohali), Punjab, India, 2017.
- Efficient Absorption of Solar Energy Using Nanoparticle-Laden Fluids, during the First International Conference on Sustainable Energy and Environmental Challenges (SEEC - 2017) held at *Center of Innovative and Applied Bioprocessing (CIAB)*, Mohali, India, 2017.
- Role of Nanotechnology in Optimizing Solar Thermal Energy, during the 4th National Conference on Advancement in Simulation & Experimental Techniques in Mechanical Engineering, at *Chandigarh University*, India, 2017.
- Current Developments in the Use of Nanotechnology in Thermal & Fluids Engineering, during the Faculty Development Programme on Recent Trends and Advances in Engineering and Technologies at *U.I.E.T, Kurukshetra University*, India, 2017.
- Efficient Energy Transfer & Storage: Utilizing Nanoparticles for Harnessing Solar Energy, during the *Le Studium* Conference on 'Future Strategies in Electrochemical Technologies for Efficient Energy Utilization' at *Tours*, France, 2016.
- Nanotechnology and its Applications in Solar Thermal Engineering, during the Faculty Development Program, at *Chandigarh University*, India, 2016.
- Bio-Heat Transfer and its Role in Hyperthermia, during the Faculty Development Program on 'Thermal Energy and its Applications', *Chandigarh Engineering College*, India, 2016.
- Applications of Nanoscale Heat Transfer, during the Faculty Development Program on 'Emerging Trends in Mechanical Engineering', *R.I.E.I.T.*, India, 2015.
- Solar Energy: Nanoparticle Applications in High Heat Flux Solar Collectors, during the Ninth National Frontiers of Engineering Symposium (9NatFoE) for Young Indian Engineers, Indian National Academy of Engineering (INAE), *IIT Jodhpur*, India, 2015.

- Solar Thermal Energy: Nanoparticles for Enhanced Energy Conversion, during the workshop on 'Innovations in Solar Thermal Energy Storage Technologies and its Future Prospects', *TERI University*, India, 2015.
- Solar Energy: Nanofluid Volumetric Receivers, during the Short Term Course on 'Heat Transfer in Chemically Reacting Systems', *IIT Roorkee*, India, 2014.
- Utilization of Nanotechnology in Harnessing Solar Energy, during the Faculty Development Program on 'Advances in Thermal Energy', *U.I.E.T, Kurukshetra University*, India, 2014.
- Nanofluid Applications in High Heat Flux Solar Collectors, during the Faculty Development Program on 'Advanced Energy and Thermal Systems', *DCRUST*, Murthal, India, 2014.
- Renewable Energy Applications, *KC Institute*, India, 2014.
- Harvesting Solar Energy Using Nanotechnology, during the Indo-US Workshop on Recent Advances in Micro/Nanoscale Heat Transfer and Applications in Clean Energy Technologies at *IIT Ropar*, India, 2013.
- Applications of Nanoparticles in Harnessing Solar Thermal Energy, during the International Conference on Interdisciplinary Areas with Chemical Sciences (ICIACS 2013), *Panjab University*, Chandigarh, India, 2013.
- Clean and Renewable Energy Resources, during the International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering, *Punjab Technical University*, Jalandhar, India, 2013.
- Opportunities in Solar Thermal Collectors, *Chandigarh University*, India, 2013.
- Technology Advances in Sustainable Energy Applications, during the 'Short Term Training Programme on Solar Energy and its Applications' (STTP-SEA) at *MANIT Bhopal*, India, 2013.
- Applicability of Nanoparticle Suspensions in High Flux Solar Collectors, during the 'Short Term Training Programme on Solar Energy and its Applications' (STTP-SEA) at *MANIT Bhopal*, India, 2013.
- Utilizing Nanoparticles for Harnessing Solar Thermal Energy, *NIT Hamirpur*, as part of the National Workshop on Power Generation from Renewable Energy Sources sponsored by Ministry of New and Renewable Energy, India, 2013.
- Harvesting Solar Energy Using Nanofluids-Based Concentrating Solar Collection, School of Photovoltaic and Renewable Energy Engineering (SPREE), *University of New South Wales (UNSW)*, Sydney, NSW, Australia, 2012.
- Role of Nanotechnology in Harnessing Renewable Energy, *RBCEBTW College*, as part of Faculty Development Program on 'Emerging Trends in Nanoscience and Technology' sponsored by PTU (Punjab Technical University), India, 2012.
- Energy Sustainability: An Indian Context, *Powertech Labs Inc.*, Surrey, British Columbia, Canada, 2011.
- New and Renewable Energy Resources in India, *NRC Institute for Fuel Cell Innovation*, Vancouver, British Columbia, Canada, 2011.
- Solar Energy: Nanofluids-Based Direct Absorption Solar Collectors, *Simon Fraser University*, Surrey, British Columbia, Canada, 2011.
- Development and Usage of Clean Energy Resources in India, *Simon Fraser University*, Burnaby, British Columbia, Canada, 2011.