

Curriculum Vitae

Personal Information



Dr Rahul Yadav

*Assistant Professor
School of Energy & Environmental Systems,
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Focused Areas of Research

- Gas and Particle Radiation
- Artificial Intelligence & Optimization in Energy Systems
- Gas Hydrates & Methane Recovery
- Hydrogen Feuling and Storage

Education

- **PhD** in Mechanical Engineering with specialization in Heat Transfer (2018), Indian Institute of Technology (IIT) Madras, Chennai.
- **MS** in Mechanical Engineering with specialization in Heat Transfer (2018), Indian Institute of Technology (IIT) Madras, Chennai. with CGPA: **8.81/10**
- **BE** in Mechanical Engineering (2013) from Swami Vivekananda Technical University (SVTU), Bhilai with CGPA: **8.94/10**

Professional Experience

- **Assistant Professor**, School of Energy & Environmental Systems, Defence Institute of Advanced Technology, DRDO, Pune. *(Sep 2023-Present)*

- **Validation & Application Engineer, Thermo-Fluids System Design**, at Altair Engineering Inc, Bengaluru. *(May 2021-Sep 2023)*
 - ◆ Solver development and Application of Altair’s general purpose Thermo-Fluids System Design Software-Flow Simulator™
(https://www.youtube.com/watch?v=6Atoa_G3kuY)
 - ◆ Development of new solution techniques for thermal management of modern automotive systems (Hydrogen Vehicles and EVs).

- **Institute Post-Doctoral Fellow** in the Department of Mechanical Engineering, **Indian Institute of Technology (IIT) Kanpur**. *(Nov 2018-May 2021)*
 - ◆ Microwave radiation induced gas recovery from methane hydrate reservoirs.
 - ◆ Numerical modelling of production induced land subsidence during gas recovery from hydrate reservoirs.

Invited Lectures/FDP/Workshop Delivered

- Invited Speaker in Short Term Course on “*Thermal Management: An overview, Challenges, and Solutions*” (NIT Surat, 2020).
- Technical workshop on ‘*Thermal management of modern automotive systems using Altair Flow Simulator*’ (Altair Technology Conference, 2022)
- Invited Speaker in an FDP on ‘*Computational Solutions to Heat Transfer Problems using MATLAB*’ (St. Joseph Engineering College, Mangalore, 2021)
- Technical workshop on ‘*Use of Flow Simulator for Secondary Air Systems and Gas Turbine Combustion Modelling*’ (BHEL India, Bangalore, 2023)

Peer Recognition/Awards/Fellowships

- Awarded **Institute Post Doctoral fellowship** for a period of 2 years by Indian Institute of Technology, Kanpur. *(Nov 2018)*
- Awarded **Pre-Doctoral fellowship** for a period of 6 months by the Institute in reward to the early completion of PhD thesis by IIT Madras. *(April 2018)*

Peer Reviewing

- Reviewer for the journal *Inverse Problems in Science and Engineering*, Taylor and Francis, since June 2020.

Technology Development

- Developed WISDOM Software for Gas and Particle Radiation Analysis in Solid Rocket Exhaust Plumes for **Vikram Sarabhai Space Center**, ISRO (2014-2016).

- Developed Labyrinth seal element, and Electric motor thermal analysis module in the commercial software **Altair Flow Simulator** (2021-2023).
- Co-Developed MWThermal, and HydGeo software for microwave radiation induced gas recovery and land subsidence estimation for **IIT Kanpur-ONGC Project** (2018-2021).

Research Publications

Book:

1. **Rahul Yadav**, C Balaji and S.P. Venkataeshan, ‘*Radiative Heat Transfer in Participating Media: With MATLAB Codes*’, First edition, **Springer** International Publishing, Switzerland. (doi: <https://doi.org/10.1007/978-3-030-99045-9>), (ISBN: 978-3-030-99045-9)

International Journals:

(Note: all impact factors are as per JCR 2022 database)

1. **Rahul Yadav**, Akash Gupta, Malay K Das, PK Panigrahi, Investigation on a controlled microwave heating technique for efficient depressurization in methane hydrate reservoirs, *Energy Reports*, Vol. 8, pp. 7825-7839, 2022. (**SCI, JCR Impact Factor: 5.2**)
2. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Implementation of SLW model in the radiative heat transfer problems with particles and high temperature gradients, *International Journal of Numerical Methods for Heat and Fluid Flow*- Vol. 27, Issue-5, pp. 1128-1141, 2017. (**SCI, JCR Impact Factor: 4.2**)
3. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Inverse estimation of number and location of discrete heaters in radiant furnaces using artificial neural networks and genetic algorithm, *Journal of Quantitative Spectroscopy and Radiative Transfer*, Vol. 226, pp. 127–137, 2019. (**SCI, JCR Impact Factor: 2.3**)
4. Akash Gupta, **Rahul Yadav**, Malay K Das, PK Panigrahi, Implementation of a multi-layer radiation propagation model for simulation of microwave heating in hydrate reservoirs, *International Journal of Numerical Methods for Heat and Fluid Flow*, Vol. 32, Issue 2, pp. 684-713, 2022, (**SCI, JCR Impact Factor: 4.2**)
5. Raghavendra P Singh, **Rahul Yadav**, K Muralidhar, Malay K Das, Effect of confined boundary and mud-layers on depressurization-based gas recovery and land subsidence in hydrate reservoirs, *Marine Geo-resources and Geotechnology*, Vol. 40, Issue-1, pp. 78-95. (**SCI, JCR Impact Factor: 2.2**)
6. **Rahul Yadav**, Swapnil Tripathi, Shailendra Asati, Malay K Das, A combined neural network and simulated annealing based inverse technique to optimize the heat source

control parameters in heat treatment furnaces, *Inverse Problems in Science and Engineering*, Vol. 28, Issue 9, pp. 1265-1286, 2020. (**SCI, JCR Impact Factor: 1.3**)

7. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Analysis of radiative transfer in body fitted axisymmetric geometries with band models and anisotropic scattering, *Computational Thermal Sciences: An International Journal*, Vol. 11, Issue 1-2, pp. 161-176, 2019. (**SCI, JCR Impact Factor: 1.5**)
8. **Rahul Yadav**, Raghavendra Pratap Singh and Malay K. Das, Semi-analytical estimation of surface subsidence during gas recovery from hydrate reservoirs under Indian conditions, Chapter in book *Advances in offshore Geotechnics*, Series of Lecture Notes in Civil Engineering, Vol. 92, pp. 289-301, 2020, Springer Nature, Singapore. (**SCOPUS, Cite Score: 0.5**)
9. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Optimization of number and locations of discrete heaters in a two-dimensional radiant heating furnace using artificial neural networks, *Journal of Energy and Environmental Sustainability*, Vol. 8, pp. 12-18, 2019. (**Official publication of International Society of Energy and Environmental Sustainability**)
10. Anushka Sreshth, **Rahul Yadav**, Malay K. Das, Optimization of depressurization and injection pressure for safe and sustainable gas recovery from hydrate reservoirs, *Fluid Mechanics and Fluid Power (Vol. 2)*, Lecture Notes in Mechanical Engineering, 2023, pp. 59-64, Springer Nature, Singapore. (**SCOPUS, Cite Score: 0.7**)

International Conferences:

1. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, A radiative transfer analysis in three dimensional rectangular furnaces with non-gray gases and soot in a high temperature gradient field, Proceedings of 6th Asian Symposium on Computational Heat Transfer (ASCHT-2017), Chennai, India, pp. 1000-1007, 2017.
2. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Analysis of radiative transfer in body fitted axisymmetric geometries with band models and anisotropic scattering, Proceedings of CHT-17 ICHMT International Symposium on Advances in Computational Heat Transfer Napoli, Italy, pp. 305-318, 2017. DOI: 10.1615/ICHMT.2017.CHT-7.360
3. **Rahul Yadav**, Raghavendra Pratap Singh and Malay K. Das, Pore Compressibility Studies on CH₄ Hydrate Dissociation during Depressurization and Simultaneous CO₂ Sequestration, International Heat and Mass Transfer Conference (IHMTTC)-2019, Dec 28-

31, IIT Roorkee, India. Published: ISHMT Digital Library, Vol. 2, pp. 1143-1148. (doi: <https://doi.org/10.1615/IHMTC-2019.1920>)

4. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, Analysis of particle distribution and spectral averaging of particle properties in radiative base heating problems, International Heat and Mass Transfer Conference-2015, Thiruvananthapuram, India.
5. **Rahul Yadav**, C. Balaji, S.P. Venkateshan, A generalized radiative transfer analysis in three dimensional rectangular enclosures with non-gray gases and particles under the conditions of a reheating furnace, Computational Thermal Radiation in Participating Media VI 2018, Cascais, Portugal.
6. **Rahul Yadav**, Dinesh Bhakar, Malay K. Das, Effect of furnace height on optimum heater configurations in a radiant furnace using combined ANN-GA approach, National Conference on Multi-disciplinary Design And Optimization (NCMDAO 2020), 20-21 Mar, VSSC, ISRO, Trivandrum.