

Special issue on new trends in heat and fluid flow: applications and recent developments

Heat and fluid flow have an ability to deal with technological-based systems and generally cover a wide variety of fundamental studies, theoretical mathematical modeling and experimental investigations relating to conduction, convection, condensation, boiling and radiation in systems, processes, materials and many other related objects. This issue invited the researchers to present their latest original research findings which are either advances in the state-of-the-art of mathematical methods, theoretical studies or experimental studies that extend the bounds of existing methodologies to new contributions addressing current challenges and engineering problems related to increasing or decreasing the heat transfer distribution. In fact, this issue has served as a platform for innovation and provided up-to-date findings to readers.

In response to the call for papers, round 50 papers were submitted for possible publication. After comprehensive peer review, only one third papers qualified for acceptance for final publication. This special issue comprises the theoretical and experimental research articles that elucidate the research efforts and recent developments on “New Trends in Heat and Fluid Flow: Applications and Recent Developments.” This issue consists of (Agrawal *et al.*, 2021; Akbari *et al.*, 2021; Alanazi *et al.*, 2021; Alkanhal, 2021; Chang *et al.*, 2021; Chen *et al.*, 2021; Dehghan *et al.*, 2021; Hayat *et al.*, 2021; Riaz *et al.*, 2021; Saadun *et al.*, 2021; Safdari Shadloo, 2020; Selimefendigil and Öztö, 2021; Ullah *et al.*, 2021; Xing *et al.*, 2021; Yilmaz, 2021; Youjun *et al.*, 2020; Zaher *et al.*, 2021; Zhang *et al.*, 2020) accepted papers related to fluid dynamics; heat exchangers; heat transfer enhancement; heat and mass transfer in thermal energy; heat and mass transfer in porous media; heat transfer phenomena in biological systems; nanofluids; two-phase/multiphase flows; Newtonian and non-Newtonian fluids; thermodynamics; and numerical simulations and methods. The presented results are discussed with an adequate physical interpretation.

The rest of two third papers could not be accommodated. The submissions may have been technically correct but were not considered appropriate for the scope of this special issue. The authors are from geographically distributed countries such as the USA, Canada, France, China, Romania, Belgium, Turkey, Saudi Arabia, Pakistan, Malaysia, Vietnam, Morocco, Egypt, India, Vietnam and Iran. This reflects the great impact of the proposed topic and the effective organization of the guest editorial team of this special issue. We hope that this issue will not only provide an overall picture and most up-to-date findings to readers from the scientific community working in the field but would also benefit the industrial sectors in specific market niches and end users.

The guest editor would like to thank all authors for contributing their original work to this special issue, no matter what the final decision on their submitted manuscript was. The



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R. Ellahi

*Department of Mathematics and Statistics, FBAS, International Islamic University,
Islamabad, Pakistan and Department of Mechanical Engineering,
University of California Riverside, Riverside, California, USA*

References

- Agrawal, P., Dadheech, P.K., Jat, R.N., Beleanu, D. and Purohit, S.D. (2021), "Radiative MHD hybrid-nanofluids flow over a permeable stretching surface with heat source/sink embedded in porous medium", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Akbari, S., Hasanvand, N., Sadeghi, S., Bidabadi, M. and Xiong, Q. (2021), "Mathematical modeling of the production of magnetic nanoparticles through counter-flow non-premixed combustion for biomedical applications", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Alanazi, A.A., Alamri, S.Z., Shafie, S. and Mohd Puzi, S. (2021), "Crank-Nicolson scheme for solving the modified nonlinear Schrodinger equation", *International Journal of Numerical Methods for Heat and Fluid Flow*, doi: [10.1108/HFF-10-2020-0677](https://doi.org/10.1108/HFF-10-2020-0677).
- Alkanhal, T.A. (2021), "Develop artificial neural network numerical modeling to study fluid flow and heat transfer of dispersed nanoparticles through base liquid", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Chang, A., Sun, H., Vafai, K. and Kosari, E. (2021), "Numerical analysis of flow and forced convection heat transfer of non-Newtonian fluid in a pipe based on fractional constitutive model", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Chen, S., Lei, H., Wang, M., Ding, C., Dou, W. and Chang, L. (2021), "Turbulent flow with nonequilibrium chemical reaction in single snorkel RH", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Dehghan, M., Azari Nesaz, Z., Pourrajabian, A. and Rashidi, S. (2021), "On the forced convective flow inside thermal collectors enhanced by porous media: from macro to micro-channels", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Hayat, T., Muhammad, K. and Alsaedi, A. (2021), "Numerical study of melting heat transfer in stagnation-point flow of hybrid nanomaterial (MWCNTs+Ag+Kerosene oil)", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Riaz, A., Abbas, T., Zeeshan, A. and Doranehgard, M.H. (2021), "Entropy generation and MHD analysis of a nanofluid with peristaltic three dimensional cylindrical enclosures", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Saadun, N.H., Jaafar, N.A., Md Basir, F. and Safaei, M.R. (2021), "The effect of body acceleration on the dispersion of solute in a non-Newtonian blood flow through an artery", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Safdari Shadloo, M. (2020), "Application of support vector machines for accurate prediction of convection heat transfer coefficient of nanofluids through circular pipes", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Selimefendigil, F. and Öztöp, H.F. (2021), "Unsteady conjugate heat transfer with combined effects of MHD and moving conductive elliptic object in CNT-water nanofluid with ventilation ports", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Ullah, N., Nadeem, S., McCash, L., Saleem, A. and Issakhov, A. (2021), "Simulations of micropolar nanofluid-equipped natural convective-driven flow in a cavity", *International Journal of Numerical Methods for Heat and Fluid Flow*, doi: [10.1108/HFF-08-2020-0504](https://doi.org/10.1108/HFF-08-2020-0504).

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- Xing, Z.B., Han, X., Ke, H., Zhang, Q.G., Zhang, Z., Xu, H. and Wang, F. (2021), "Multi-phase lattice Boltzmann (LB) simulation for convective transport of nanofluids in porous structures with phase interactions", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Yilmaz, I. (2021), "A novel buoyancy-modified subgrid-scale model for Large-Eddy simulation of turbulent convection", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Youjun, J., Vafai, K., Xu, H. and Jianjun, L. (2020), "Analysis of the channeling of water injection in low permeability reservoirs with interlayer considering the seepage–stress coupling", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Zaher, A.Z., Khalid, K.A. and Mekheimer, K.S. (2021), "Electroosmosis forces EOF driven boundary layer flow for a non-Newtonian fluid with planktonic microorganism: Darcy forchheimer model", *International Journal of Numerical Methods for Heat and Fluid Flow*.
- Zhang, L., Bhatti, M.M. and Michaelides, E.E. (2020), "Electro-magnetohydrodynamic flow and heat transfer of a third-grade fluid using a Darcy-Brinkman-Forchheimer model", *International Journal of Numerical Methods for Heat and Fluid Flow*.