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Notice for the PhD Viva Voce Examination

Ms Anandika Rajeev (Registration Number: 2071507), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Wednesday, 13 November 2024 at 12.00 pm in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**Heat and Mass Transfer Analyses of Nanofluid in a Multilayer Model**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr D Srinivasacharya** Professor Department of Mathematics National Institute of Technology Hanamkonda, Telangana - 506004
External Examiner (Within Karnataka)	:	**Dr G Jayalatha** Associate Professor Department of Mathematics R V College of Engineering Mysore Road, Bengaluru Karnataka - 560059
Supervisor	:	**Dr Manjunatha S** Associate Professor Department of Mathematics School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 06 November 2024

ABSTRACT

The study offers an in-depth exploration into the dynamics and properties of multilayered nanofluids and hybrid nanofluid flow in different geometries. The investigation ranges from sinusoidal channels with micropolar hybrid nanoliquids to concentric cylinders that exhibit electrokinetic effects and rotating disks. Also, the Darcy-Forchheimer model is introduced to assess non-Newtonian and Newtonian fluid interplay, emphasizing the role of asymmetric slip conditions which reduces the fluid flow. Moreover, the study on bioconvection obtained by addition of gyrotac-tic microorganisms which enhances mass and heat transfer in multilayer Newtonian fluid channels. Studies explain the importance of interfacial regions in achieving optimal system temperature.

The subsequent study examines the two-layer hybrid nanofluid (HNF) with magnetohydrodynamic properties between two identical ro-tating disks. The governing equations of the mathematical models are explained using PDE and solutions are attained using numerical and semi-analytical methods such as the DTM and Range Kutta method. Further, the obtained results have been explained with the help of tables and graphs. The study reveals that the immisci-bility of the base fluids forms an interfacial layer, revealing that the addition of two different fluids restricts the fluid motion nearer to the interfacial region, maintaining an optimum temperature in the system. Collectively, these findings pave the way for advanced applications in industries like solar, nuclear, biomedical, and electronic cooling, promising enhanced performance and efficiency.

Keywords: Multilayer fluid flow; Hybrid nanofluid,; Nanofluid; Differntial Transorm method; Rangekutta Feildberg method.

Publications:

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3. Anandika, R., Puneeth, V. and Manjunatha, S., "The Darcy–Forechhiemer multilayer model of Casson nanofluid squeezed by Newtonian nanofluid under asymmetric slip conditions," The European Physical Journal Plus, 137(12), pp.1-14, 2022.
4. Anandika, R., Puneeth, V., Manjunatha, S., Shehzad, S.A. and Arshad, M., "Exploration of Thermophoresis and Brownian motion effect on the bioconvective flow of Newtonian fluid conveying tiny particles: aspects of multi-layer model," Proceedings of the institution of mechanical engineers, part C: journal of me-chanical engineering science, 236(19), pp.10185-10199,2022.
5. Rajeev, A., Manjunatha, S. and Vishalakshi, C.S., "Electro-osmotic effect on the three-layer flow of Binary nanoliquid between two concentric cylinders," Journal of Thermal Analysis and Calorimetry, 147(24), pp.15069-15081, 2022.
6. Rajeev, A., Puneeth, V., Manjunatha, S., and Makinde, O. D., "Magnetohydrodynamic flow of two immiscible hybrid nanofluids between two rotating disks,"Numerical Heat Transfer, Part A: Applications, pp. 1–19, 2024.