



Editorial

Dear Readers,

In this fast-changing world, research has expanded beyond boundaries, becoming a continual pursuit of knowledge. All these accomplishments are effectively documented, paving the way for groundbreaking discoveries and fascinating innovations. The journal plays an important role in supporting and encouraging the research journey of every individual. The Mapana Journal of Sciences (MJS) continues to stand as a medium for scientific progress, nurturing ideas that link innovations with sustainability. It gives immense pleasure to the editorial team of Mapana Journal of Sciences to present you with the third issue for the year 2025. We are confident that this edition will bolster our purpose of publishing noteworthy and impactful articles.

This issue opens with an article by Vithyadevi and Annadurai that features an insightful study on multi-item, multi-purchaser inventory systems that addresses the challenges of optimising cost and order qualities under crisp and fuzzy conditions. This work employs fuzzification techniques and Kuhn-Tucker method which provides an efficient approach to cost minimisation. The paper by Abhishek and Mala analyses the study of Oldroyd-B fluid Nanofluid under magnetic influence using linear and nonlinear methods. It emphasises how the magnetic and the Prandtl numbers stabilise convection whereas nanoparticle concentration promotes instability.

Premalatha et al., have presented the preparation and characteristics of 5-Amino-1-isonicotinoyl-3-(4-nitrophenyl)-2,3-dihydro-1H-pyrazole-4-carbonitrile (AINDPC) that is developed to address the growing threat of multidrug-resistant infections. Combining experimental and computational approaches, the research highlights the compound's stability, favorable drug-like properties, and effective interaction with microbial targets.

Charge Transfer (CT) complexes are crucial in modern chemistry as they have applications in organic electronics, sensors and catalysis. In this context, the study by Mittal et al., explores the synthesis and characterisation of 4 novel CT complexes between imidazole-based donors and dimethyl acetylenedicarboxylate (DMAD). This study reveals the strong donor-acceptor interaction and the stable complex formation was confirmed by both DFT and Spectrophotometric investigations. The paper by Kottan et al., explores the synthesis of Vanadium Carbide-Carbon Shells Nano material and α -aluminium oxide along with demonstrating their incorporation into alumina composites. They investigated their response

under shock wave conditions revealing enhanced compressive strength and good thermal stability.

The work by Sivakumar C and Robin Francis presents a fascinating cosmological model exploring the accelerating expansion of the flat Universe through an equation of state parameter that varies inversely with the square of the scale factor. By varying the effective pressure parameter, the authors illustrate a smooth transition deceleration to acceleration that offers deeper insights on the role of dark energy in cosmic evolution. Phase transitions in ferroelectric liquid crystals offer deep insights into the molecular behaviour under external field. With this, Biswas et al., present a theoretical model based on Landau free energy expansion to explain the electroclinic effect very near to the Smectic C* -Smectic A* transition point of FLC molecules. This was achieved by introducing a new secondary order parameter (D) that captures the system's capacitive and field-induced tilt characteristics.

Kannoli et al., experimentally explored the hydrothermal synthesis of nickel nanoferrites and their structural, morphological, and optical properties. Their findings highlight the material's potential for use in catalysis, data storage and also confirms the material's semiconducting behaviour.

Comprehending the working of brain mirrors observed actions has transformed our perception of cognition. The paper by Bhalothia et al., delves into the role of mirror neurons within the action observation network (AON). They propose a more nuanced framework that includes the third visual pathway via the superior temporal sulcus (STS), thereby expanding our grasp of neural mechanism. Kumarapandiyan et al., introduces a statistical modelling framework to enhance diagnostic accuracy in medical research through a tri-class Receiver Operating Characteristic (ROC) model. They further validated the model through simulations and applied to real clinical datasets related to cardiovascular diseases. The proposed approach enables more accurate classification of medical data into normal, suspicious, and diseased categories.

As we present this issue of our journal, we extend our heartfelt appreciation to all the authors, reviewers, editorial board members, and assistant editors whose contributions have made this publication possible. We gladly welcome you to explore this issue, to engage deeply and venture beyond the horizons, where the possibility of research is limitless.

Dr Manoj Balachandran
Editor