PREFACE TO THE EDITION

It is with great pleasure that we present this issue of the **International Journal of Pure Science Research Studies (IJPSRS)**, bringing together five scholarly contributions that reflect the diversity and interdisciplinary nature of contemporary scientific research. The articles cover important areas of astronomy, materials science, biological sciences, mathematics, and animal behaviour, demonstrating how scientific inquiry continues to expand our understanding of natural phenomena and emerging scientific challenges.

The issue opens with an exploration of how polarimetry helps assess the surface properties of asteroids and the Moon. The article examines the polarization of scattered sunlight, focusing on phase-polarization curves and the influence of particle size and composition. It also discusses methods for estimating grain sizes and the relationship between polarimetric parameters and geometric albedo, highlighting the importance of these measurements in understanding planetary surface characteristics.

The field of materials science and environmental technology is represented by a review of metal-organic frameworks for carbon dioxide capture. The article examines their structural design, adsorption mechanisms, and performance in separating carbon dioxide from flue gas and atmospheric air. Particular attention is given to working capacity, selectivity, regeneration energy, and material stability, highlighting their potential for developing efficient and practical carbon capture technologies.

The biological sciences are represented by an examination of amphibian declines associated with fungal diseases, particularly chytridiomycosis. The article discusses the pathogens responsible for widespread amphibian population losses, their effects on essential physiological processes, and the factors influencing disease outcomes. It also highlights the role of international amphibian trade in pathogen spread and examines conservation measures such as biosecurity, trade regulation, and captive assurance programmes.

A significant mathematical contribution to this issue examines the total stopping times associated with the Collatz map. Through computational analysis of integers up to 10^7, the study evaluates the random-walk model and its predictions concerning the mean, variance, and distribution of stopping times. The findings show considerable agreement with theoretical predictions while identifying certain deviations, demonstrating the value of computational methods in investigating unresolved mathematical problems.

Completing this issue is an exploration of magnetic orientation and navigation in migratory animals. The article examines how species such as birds, sea turtles, salmon, and butterflies use the Earth's magnetic field for directional guidance and navigation. It discusses the proposed radical-pair mechanism involving cryptochrome proteins and the role of biogenic magnetite, while highlighting the continuing scientific efforts to identify the precise sensory mechanisms involved.

Taken together, the contributions in this issue illustrate the diversity of contemporary pure science and the connections between theoretical understanding, experimental investigation, and computational research. From planetary surface studies and carbon capture technologies to biodiversity conservation, mathematical modelling, and animal navigation, these articles demonstrate the continuing importance of scientific inquiry in advancing knowledge across disciplines.

We hope that this issue of IJPSRS will provide researchers, academicians, students, and scientific professionals with valuable insights and encourage further investigation, interdisciplinary dialogue, and scholarly collaboration.

We sincerely thank all the authors, reviewers, and editorial contributors whose efforts have made this issue possible. We look forward to continuing our commitment to disseminating rigorous and meaningful research through the International Journal of Pure Science Research Studies.

Dr. Sandhya E
Chief editor

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