Mapana - Journal of Sciences
2021, Vol. 20, No. 2, *v-vii*
ISSN 0975-3303 | https://doi.org/10.12723/mjs.57.0

Editorial

It is indeed a great pleasure and privilege for me to introduce the current issue of Mapana Journal of Sciences. Mapana is a multi-disciplinary journal committed in publishing original and novel research and review articles in the discipline of Science. Mapana provides authors a platform to publish note-worthy research articles in the field of Physical Sciences, Chemical Sciences, Mathematical and Life Sciences.

In the present issue, we publish five articles pertaining to Theoretical physics and Mathematics which discuss the novelty and advancements of the respective field. We appreciate and acknowledge all the authors for their valuable contribution to Mapana Journal of Sciences.

Seyfert galaxies and quasars are the most interesting objects among the different types of active galaxies as they show the continuum and line variability over a long range of wavelength and time scales. The long term observations at the UV wavelength region would be useful in understanding the possible correlations among accretion disk properties with the physical conditions in broad-line region (BLR). In article titled UV Continuum And Emission Line Variability study of Mrk 841, Bryan Rithesh and co researchers present results on the long-term continuum and emission-line variability studies on Mrk 841, a bright nearby active galaxy using the IUE's spectroscopic data from 1978 to 1993. They analysed the archival data over 15 years to characterise the continuum and the emission line variability. Authors conclude that the UV continuum source is spatially stratified and BLR lies at greater distance from the central radiative source on the basis of higher variability amplitudes obtained in the continuum fluxes than the strong emission lines. The C IV/Ly α and C IV / Mg II line flux ratios are found to be 0.77 and 5.08, wherein the C IV/Ly α ratio is higher than theoretical value of 0.63 predicted by the standard model of Kwan and Krolik (1981). They further report the UV to Soft X-ray

excess ratio to be ~ 7.5 from simultaneous observations of Mrk 841 by IUE, ROSAT and Ginga satellites.

The concept of the neutrino was envisaged just ninety years ago, when Wolfgang Pauli wrote his famous letter, addressed to 'Dear Radioactive Ladies and Gentlemen,' on December 4, 1930. It was addressed to the participants of a conference to discuss a crisis situation evoked by several experiments on radioactive decays of various isotopes. It was found that the electrons emerging from the beta decay had a range of energies, which led to contradictions with the very fundamental physical laws of conservation of energy and momentum. The energy associated with the decaying particle did not match the energies of the product particles, implying that some energy (momentum) was missing. The crisis was serious enough for even stalwarts like Niels Bohr to question whether energy conservation is violated in beta decay. Pauli felt that such an extreme step to resolve the issue was absurd and instead postulated the existence of a new neutral particle (presumably having no rest mass or electric charge) carrying away this missing energy. It was this bold proposal which was contained in Pauli's letter to the conference participants, which he himself was unable to attend. Sivaram and co-investigators describes a detailed account on the mysteries of nonagenarian neutrino in this paper.

Malapati and Bhaskar analysis the influence of heat generation and thermal radiation on steady hydromagnetic fully developed natural convection flow in a vertical micro–porous–channel in presence of viscous dissipation. The governing ordinary differential equations, exhibiting the physics of the flow formation are displayed. Using the relevant non–dimensional variables, the governing equations are transformed into their corresponding non–dimensional form and solved by employing perturbation technique. The influence of different admissible parameters such as fluid wall interaction parameter, Knudsen number, heat generation parameter, thermal radiation parameter, magnetic parameter, Eckert number and permeability parameter on the fluid velocity, temperature, skin friction coefficient and heat transfer coefficient at the micro–porous–channel surfaces are also discussed.

Physicists and mathematicians leverage the knowledge in fluid mechanics to optimise a multitude of complex flow phenomena in

fields like Aeronautical, biomedical, astrophysicists, geophysicists, space researchers, meteorologists and physical oceanographers. In her novel work, Anjana analysed the effect gravity modulation along with rotation in the article titled "Effect of Coriolis Force and Gravity Modulation on the onset of Double Diffusive Convection in a Weak Electrically Conducting Boussinesq-Stokes Suspension with Porous Media". Author suggests that instead of taking electrically non-conducting fluid, it is better to consider electrically conducting fluid with weak electrical conductivity as this ensures a stable environment in the presence of a magnetic field.

In the article titled Eigenstates of a Charged Simple Harmonic Oscillator in a Uniform Magnetic Field, Shivalingaswamy and Kagali describes the exact eigenstates of a charged harmonic oscillator placed in a uniform magnetic field. The harmonic oscillator potential is of great physical interest as it finds a wide range of applications in numerous problems in classical and quantum mechanics, such as vibrations of atoms and molecules in a crystal lattice etc. The harmonic oscillator potential is used in describing nuclear forces and nuclear structures, quark model of hadrons etc. In the theory of electromagnetic fields, the quanta of radiation are considered as excitations of collection of independent oscillators. The charged harmonic oscillator placed in a uniform magnetic field may find specific applications in two dimensional solids whenever charged particles are subjected to such fields.

We are delighted to find the articles are of social relevance and have implemented novel thoughts. Let this journey in pursuit of knowledge be an enriching experience for all the readers.

Manoj Balachandran
Editor