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Editorial

Dear Readers, I am delighted to present the 61st Issue of the *Mapana - Journal of Sciences*, 2022, on behalf of the Journal's editorial team. Over the past years, the journal has strived to contribute to publishing original and novel research and review articles in the discipline of science.

In this issue, we have published six articles focused on Astrophysics, Material science, and Electronics. In the first article, Elma Elizaba Mathew and Manoj Balachandran discussed the structural modification of the graphene-like system derived from Carbon Black (CB) with synthesis temperature. The authors used X-ray diffraction and Raman spectroscopy techniques to reveal the nature of the novel nanostructure. X-ray diffraction revealed the graphitic structure with a broad peak, indicating the amorphous nature regardless of the variation in temperatures. Raman spectroscopy revealed that defect intensity increased with the increase in temperature. The authors mentioned that the increase in the defect ratio is due to the structural disorder in the system. Therefore, the band gap of CB can be successfully tuned by changing the degree of defects in the system.

Utpala Venkata Satya Seshavatharam & Sreerama Lakshminarayana proposed new concepts and results pertaining to a very simple and practical quantum cosmology model which is based on light speed expanding the black hole universe having no dark matter and no dark energy. The authors discussed that the Big bang concept could be replaced with the Planck scale, and the cosmic temperature and expansion rate can be related to scale Hawking's Black hole temperature formula. From the Quantum cosmology point of view, the proposed characteristic current dark matter reference mass unit and super gravity of galactic baryonic mass can be studied with reference to the weak interaction.

The Fe^{3+} ion-modified ZnO nanomaterials were fruitfully synthesized through the co-precipitation technique at diverse sintering temperatures to explore the influence of temperature on

material synthesis and assorted properties by Anil Kaushik and Co-investigators. They determined the crystalline size, inter-planar spacing, and cell volume of the Fe^{3+} /ZnO-400. The authors utilized the Scanning Electron Microscope for morphological analysis of the samples. The photoluminescence studies were estimated at 325 nm excitation wavelength utilizing a photoluminescence spectrometer to observe the emission spectrum of samples. The Fourier transform Infrared spectrometer was used to measure IR spectra to identify the presence of bonds in the samples with peaks around 536-634 cm^{-1}. Complex impedance measurements of the Fe^{3+} /ZnO-RT and Fe^{3+} /ZnO-400 samples were estimated at 310 K using a galvanostat in the frequency range from 50 Hz to 5 MHz.

Geetha Mable Pinto & Apoorva Devadiga studied the effect of zinc oxide nanoparticles surface modified with N-[3-(Trimethoxysilyl) propyl] ethylenediamine (15.5 nm) on mild steel in 0.5M HCl at five different concentrations and temperatures using Electrochemical Impedance Spectroscopy and Tafel polarization curves. The silane-functionalized ZnO nanoparticles were synthesized using the green synthesis method using Phyllanthus Emblica (Gooseberry) leaves and zinc nitrate as precursors. Results indicated that the inhibition efficiency of synthesized mixed type of inhibitor increases up to 40℃ and then decreases because of both physical and chemical adsorption. Scanning electron microscopy analysis showed that the synthesized nanoparticle is efficient as a corrosion inhibitor. The inhibitor was characterized by Fourier Transform Infrared spectroscopy and X-Ray Diffraction techniques.

Nitin Waybhase et al., l brought the idea of using a computer's window exploitation camera to create a hand gesture-based virtual mouse that allows you to control the entire system by merely moving your fingertips. The authors developed computer software that employs other cursor control mechanisms, a virtual mouse system for laptops and PCs as an alternative to the common virtual mouse system. The developed computer vision-based system can recognize, capture, and understand gestures.

A review report on determining Planck's constant using light-emitting diodes in Undergraduate Laboratories was discussed by Harish Venkatreddy and group; an attempt was made in this article to identify and report five decades of progress in the determination

of Planck's constant in undergraduate laboratories, both in the experimental procedure as well as data analysis methods. The authors studied and compared the Planck's constant values estimated by different methods. They mentioned the scope of theoretical research in the experiment to understand and implement the concepts to determine Planck's constant using LED in undergraduate laboratories.

We look forward to future contributions to the *Mapana - Journal of Sciences* and believe this journey in pursuing knowledge will benefit all readers.

Manoj Balachandran
Editor