

Dynamics of Localized Charged Continuum: A Plausible New Paradigm

Sukalyan Bhattacharya, Associate Professor

Department of Mechanical Engineering, Texas Tech University

Abstract:

This talk discusses a potentially intriguing new paradigm where all charged particles are viewed as localized continuum instead of point entities despite their small volumes. The dynamics of arbitrary material element inside such system is analyzed after minimal alterations of classical mechanics principles. The resulting theory establishes the proportionality between energy and frequency as well as between momentum and wave-length without using any quantum mechanical postulate. Contrary to popular notions, this suggests that Planck's and de Broglie's laws can be recovered from a properly implemented classical mechanics model. The remarkable outcome seems to also indicate a new interpretation of quantum wave function for certain types of particles. Moreover, the formulation provides a mathematical recipe to calculate fine structure constant, and explains how a localized charge can exist in spite of electrostatic repulsions within itself. The talk is concluded by posing three specific questions, the answers to which would dictate the viability of the new theory in understanding fundamental dynamics of matter.

Bio:



Dr. Bhattacharya is currently an Associate Professor in Mechanical Engineering. He earned his Mechanical Engineering bachelor's degree in 1998 from Jadavpur University at Kolkata and his masters in 2000 from University of Connecticut at Storrs. Then, he received his doctorate degree in Mechanical Engineering from Yale University in 2005. His primary research is focused on theoretical fluid dynamics, statistical mechanics and mathematical physics. He has published over thirty journal articles in sources like Journal of Fluid Mechanics and Physical Reviews. He is also an inventor on one issued and one provisional patents. His research has been funded by agencies such as National Science Foundation, American Chemical Society, and Air Force Office of Scientific Research.