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STUDY OF GRAVITATIONAL EFFECTS ON CONDENSED MATTER PHYSICS IN EXCEPTIONAL CONDITIONS

Abstract

Gravity is essentially an effect of the curvature of space-time. According to supersymmetric theory, gravity should result from a fundamental particle named 'graviton'; although great efforts made to prove its existence so far, those efforts have not paid off as we would like. Its effects on macroscopic levels are successfully cracked (hence we can use GPS) through General Relativity. But gravity has to have its roots in other branches of fundamental Physics as well which, remains a mystery/opportunity for us. Majorly, gravity on a microscopic scale is most pondered upon topic intuitively as quantum mechanics does not consider the effects of gravity. Since quantum mechanics treats operators as its so-called laboratory tests, crucial to notice we do not have a gravity operator. Gravity as we know it is a long-range force, but to look into how it interacts with matter such as cryogenic fluids, critical fluids, atomic clock, and plasma crystal will most definitely have trailblazing applications. This paper will yield results from experiments conducted so far in extreme gravitational conditions for Fundamental Physics. Condensed matter physics has emerged to be a massive amalgamation of all the Fundamental Physics subjects (i.e., Thermodynamics, Statistical Mechanics, Kinetic Theory, Electromagnetism, and Quantum Mechanics) at the beginning of the 20th century. Solid-state physics is a precursor to Condensed Matter Physics. Here, we will shed light on the possible effects of gravity on Condensed Matter Physics by referring to studies of exceptional conditions in physics, which will hopefully lay the basis for new fields consequently with applications.