Towards a novel approach to semi-classical gravity

Ward Struyve

KULeuven, Holland

Semi-classical approximations to quantum theory describe part of the system classically and part quantum mechanically. In the usual approach, one considers the classical system to move under a mean force, obtained by averaging over the quantum system. I will discuss a novel and better approach based on Bohmian mechanics and this in a variety of contexts such as non-relativistic quantum theory and quantum electrodynamics. I will also discuss the progress and the remaining difficulties in obtaining such a semi-classical approach for quantum gravity.