

Contributed Talk

Name: Ahmad Borzou

Position: Staff

Affiliation: Baylor University

Title: Non-Geometrodynamical Lorentz Yang-Mills Theory of Gravity

Abstract: We present a non-geometrodynamical quantum Yang-Mills theory of gravity based on the homogeneous Lorentz group within the general framework of the Poincaré gauge theories. The obstacles of this treatment are that first, on the one hand, the gauge group that is available for this purpose is non-compact. On the other hand, Yang-Mills theories with non-compact groups are rarely healthy, and only a few instances exist in the literature. Second, it is not clear how the direct observations of space-time waves can be explained when space-time has no dynamics. We show that the theory is unitary and is renormalizable to the one-loop perturbation. Although in our proposal, gravity is not associated with any elementary particle analogous to the graviton, classical helicity-two space-time waves are explained. Five essential exact solutions to the field equations of our proposal are presented as well. We also discuss a few experimental tests that can falsify the presented Yang-Mills theory.