

Seminário, Quinta 16/10/2025 16:00h

Local: Auditório DRCC

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Title: Role of the vacuum in the classical electron, black holes and dark matter

Abstract: Lorentz' model of the classical electron as a charged spherical shell gets stabilised when filled with vacuum energy with its Poincaré stress. We found that this can be generalized to smooth charge distributions. This leads to a well defined point-limit, geodesic motion and the equivalence principle for that type of matter.

This model can be taken to cosmological scales, when the plasma has locally a small net charge density. Within Einstein-Maxwell theory, there appears a new class of charged black holes with a core rather than a singularity. Dark energy is vacuum energy while dark matter emerges as electrostatic energy plus condensed vacuum energy, without dark matter particle. This explains many phenomena, such as early structure formation due to thunders after lightnings and the flattening of rotation curves of isolated galaxies at the Mpc scale.