



# APPLIED MATHEMATICS SEMINAR

## The secret of planets' perihelion between Newton and Einstein

By

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**Abstract:** Contrary to a longstanding conviction older than 160 years, the advance of Mercury perihelion can be achieved in Newtonian gravity with a very high precision by correctly analysing the situation without neglecting Mercury's mass. The Newtonian formula of the advance of planets' perihelion breaks down for the other planets, being too large for Venus and Earth. Corrections due to gravitational and rotational time dilation, in an intermediate framework which analyzes gravity between Newton and Einstein, solve the problem. Such corrections give the same result of general relativity. Thus, the most important results presented here are two: i) It is not correct that Newtonian theory cannot predict the anomalous rate of advance of planets' orbit. The real problem is instead that a pure Newtonian prediction is too large. ii) The inclusion of time dilation effects in the Newtonian framework achieves the same precision of general relativity. This talk arises from the research paper C. Corda, Physics of the Dark Universe, 32, 100834 (2021).

**Date:** Monday, November 28, 2022

**Time:** 16:00-17:00, GMT+3

**Place:** ZOOM

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