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Space quantum technology and planetary data as probes of dark matter profiles

Monday, 18 July 2022 20:40 (20 minutes)

In this poster, I will present methods using planetary/asteroidal data and space quantum technologies to study fundamental physics.

We first show a proposal using space quantum clocks to study solar-halo ultralight dark matter, motivated by the NASA deep space atomic clock (DSAC) and Parker Solar Probe (PSP).
We then discuss new constraints on fifth forces using asteroidal data. We will show preliminary results of the robust constraints by using the NASA JPL program and asteroid tracking data that are used for planetary defense purposes.
We then discuss model-independent constraints on any dark matter profiles through pure gravity and comment on the implications on cosmic neutrinos.

The talk is largely based on https://arxiv.org/abs/2112.07674 and https://arxiv.org/abs/2107.04038, but will also contain completely new results and realistic analysis conducted in collaboration with NASA planetary defense experts.

In-person or Virtual?

In-person

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