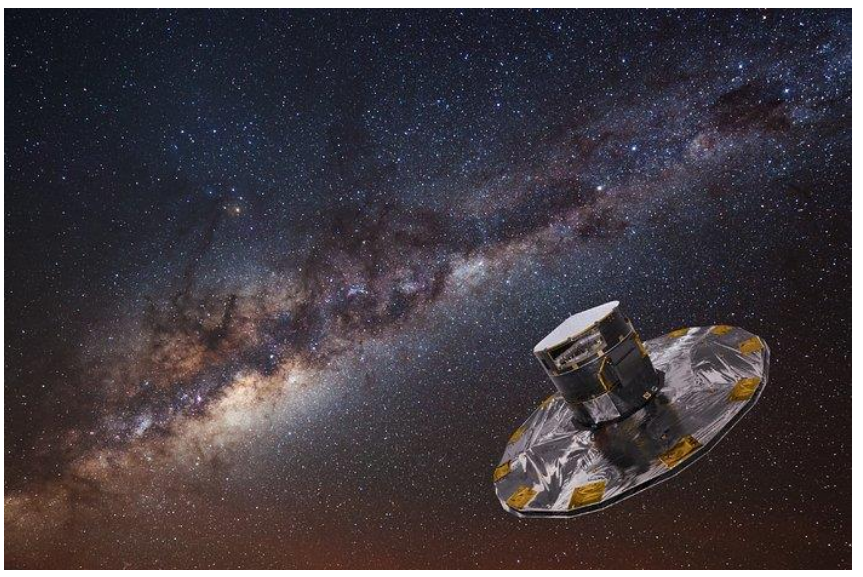
DESY
Particle and Astroparticle Physics Colloquium

Halometry from Astrometry.

Tuesday, 11 January, 2022 **Webcast 16:00 h**

Neal Weiner (NYU)

Understanding the properties of dark matter in our halo can shed light on its fundamental nature, even in the absence of a direct laboratory detection. Modern astronomic surveys – measuring the precise location over time of astronomical objects – have made tremendous progress in both precision as well as the shear number of objects observed. This opens up the possibility of looking for the effects of weak lensing from dense dark matter objects but now in the time domain. In this talk I will review both the advances present in the Gaia mission, as well as ideas of dark matter that predict various scales of collapsed dark objects in our halo. I will then discuss how measurements of the motions of luminous bodies, and measuring their velocities and accelerations, can allow us to probe the nature of dark matter on a wide range of scales, and show early results from these techniques. Finally, I will discuss how improvements in these measurements will unfold, and their ultimate ability to detect the presence of cold dark matter subhalos.



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