The GaiaNIR mission and how concepts from Theia could enhance the project.

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Abstract

A new all-sky NIR astrometric mission (GaiaNIR) will expand and improve on the science of Gaia using basic astrometry. NIR astrometry is crucial for penetrating obscured regions and for observing intrinsically red objects. The new mission is aimed at surveying around 12 billion stars in the Galaxy, revealing important new regions obscured by interstellar gas and dust while also significantly improving on the accuracy of the previous results from Gaia.

The GaiaNIR mission will achieve similar accuracy levels to Theia but will do so for almost 2 billion Gaia sources while also detecting 10 billion new NIR sources with Gaia like accuracy or better. One of the key challenges for GaiaNIR is the need for careful instrument calibration. The advanced metrology concepts being developed for Theia would greatly help in the calibration of the GaiaNIR mission, in particular for the basic angle variation between the two telescope's fields of view which is critical for parallax measurements, and for the focal plane which also needs to be calibrated very precisely. This talk will give an update on the science goals, the mission design and its current status and open a discussion of how Theia metrology concepts can help GaiaNIR.

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