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The Gaia space astrometry mission and the structure of our Galaxy

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The European Space Agency's Hipparcos satellite, operated between 1989-93, measured the accurate positions of some 100,000 stars, and its success represented a fundamentally new discipline in space science. Gaia is a vastly more advanced star-mapping satellite, building on Hipparcos, and launched by ESA in 2013. It continues to operate flawlessly today, measuring the distances and space motions of more than two billion stars with extreme accuracy. The talk will very briefly review the two thousand year history of this branch of astronomy, explain why and how these measurements are made from space, and why the measurement of star positions is of such profound scientific importance. It will emphasise the application to the study of the dynamics of our Galaxy, and in particular how this is related to our understanding of cosmological structure (and the existence of dark matter) in the CDM model.

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