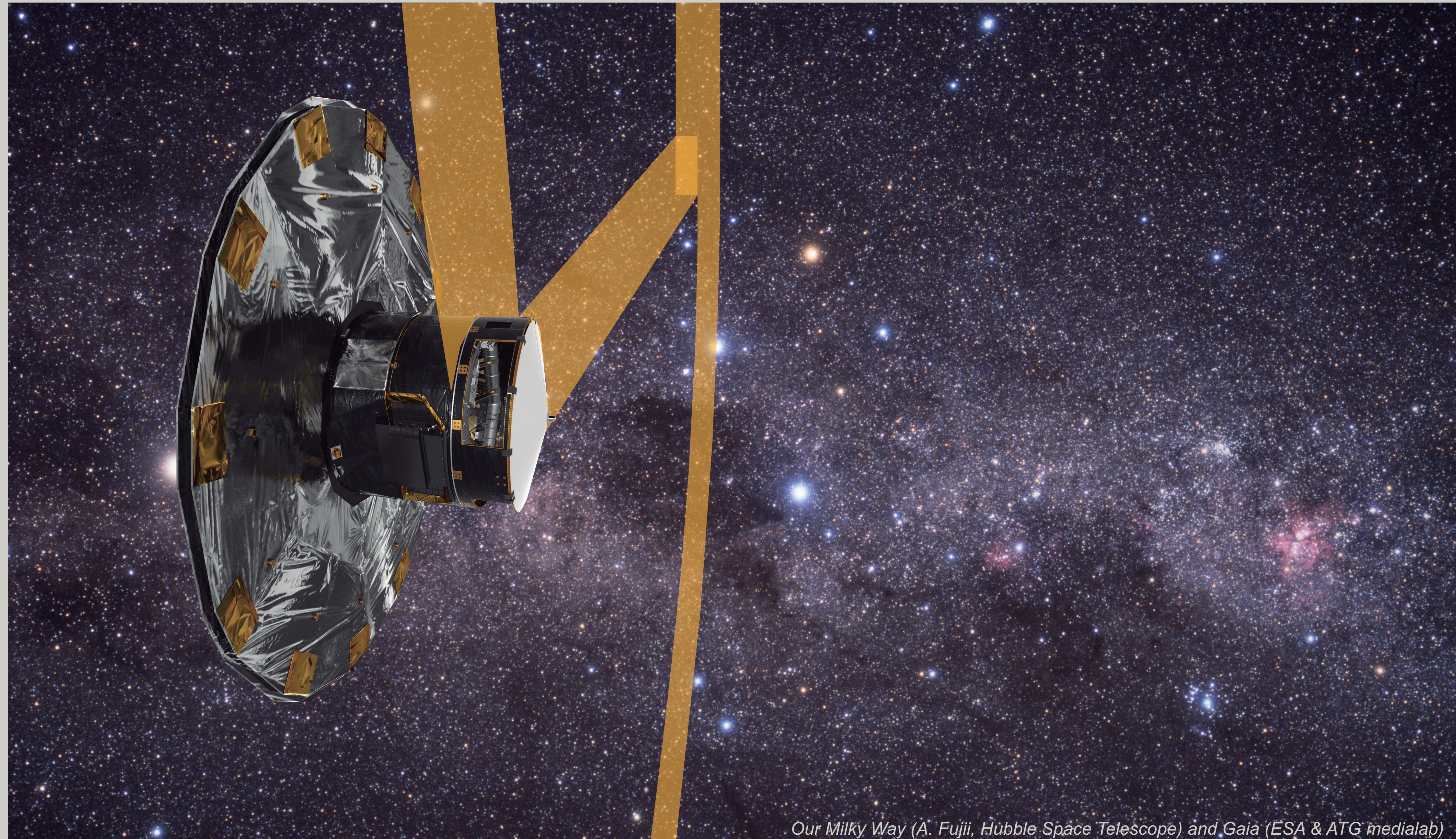


Method of observation

In six hours the two telescopes of Gaia scan a great circle on the sky and observe ten million objects.

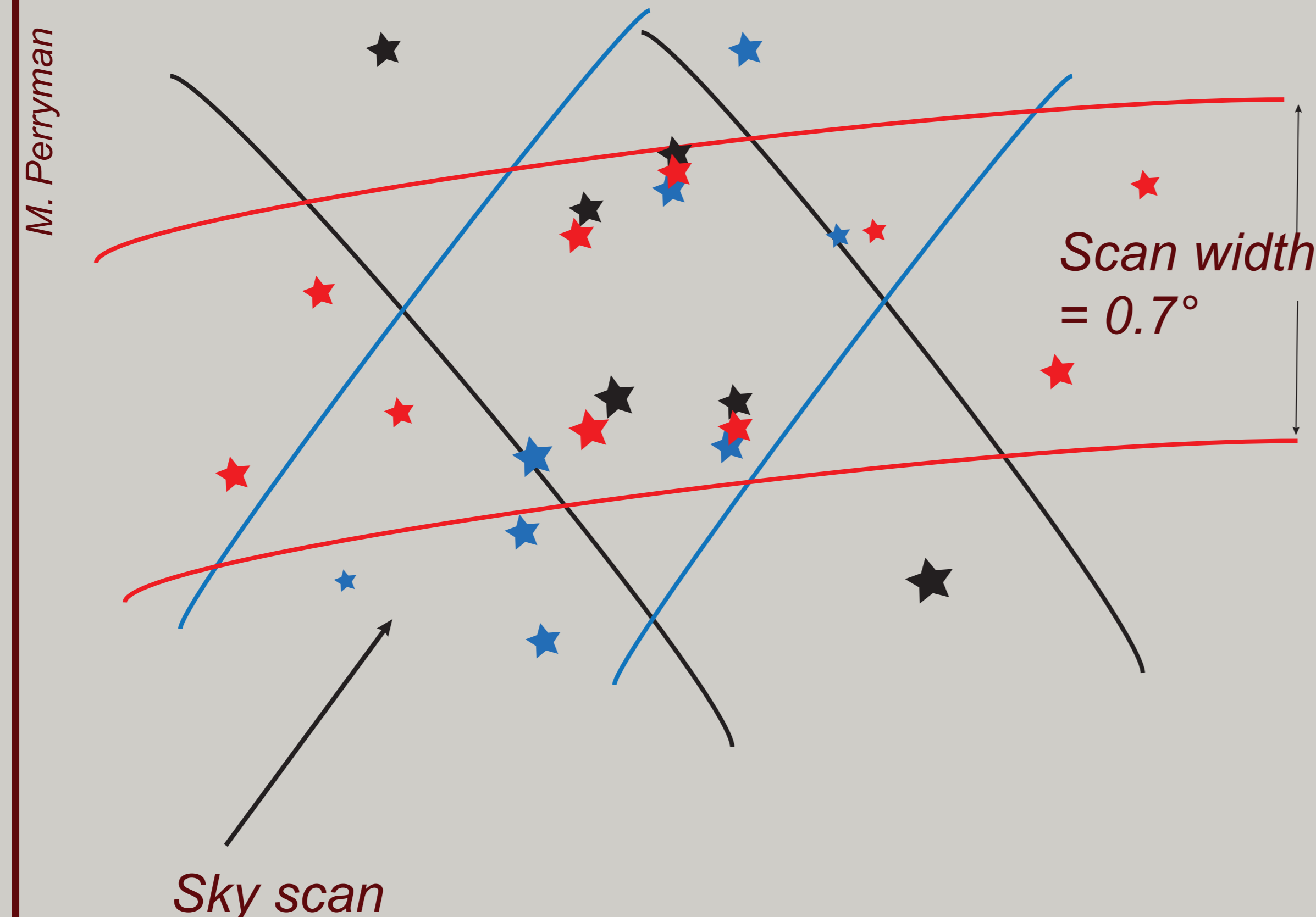


Our Milky Way (A. Fujii, Hubble Space Telescope) and Gaia (ESA & ATG medialab)

The calculation

The figure to the right displays observations made during three different days in three different colours. All of the observations of a star must be combined to calculate its position and proper motion with sufficient accuracy.

Data processing steps



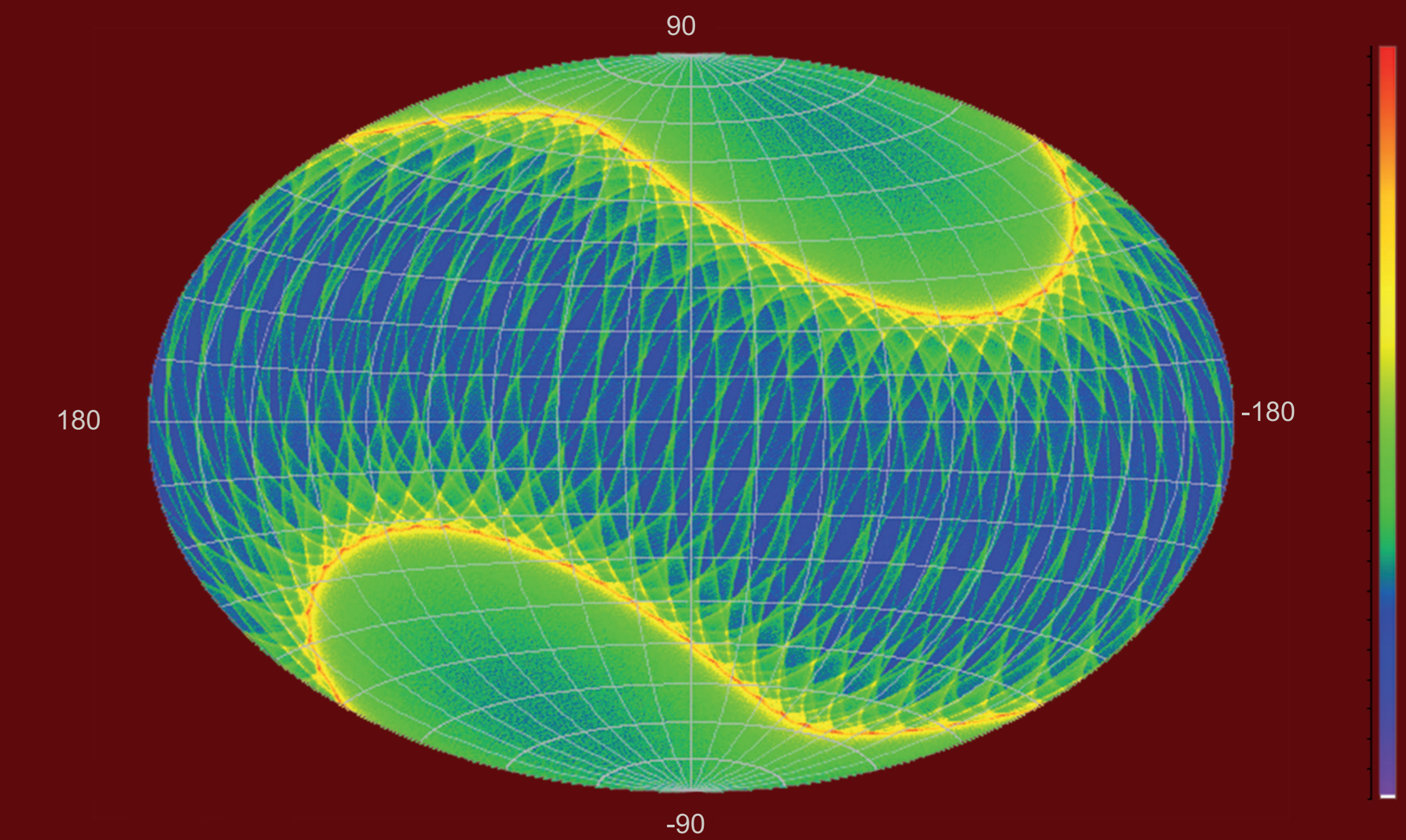
1. Identify the observations of a celestial object.
2. Determine the characteristics of the instrument.
3. Determine the positions of the objects.
4. Add more observations.
5. Repeat the process.

Scanning the sky

Gaia simultaneously measures the separations of all stars seen through the two telescopes looking in two directions 106.5 degrees apart. The scan direction varies slowly and by combining observations from several days we can work out the positions, proper motions, and distances of stars.

In five years Gaia observes the whole sky about 70 times.

Distribution of observations across the sky in 5 years (violet: minimal number of observations; red: maximal number of observations)



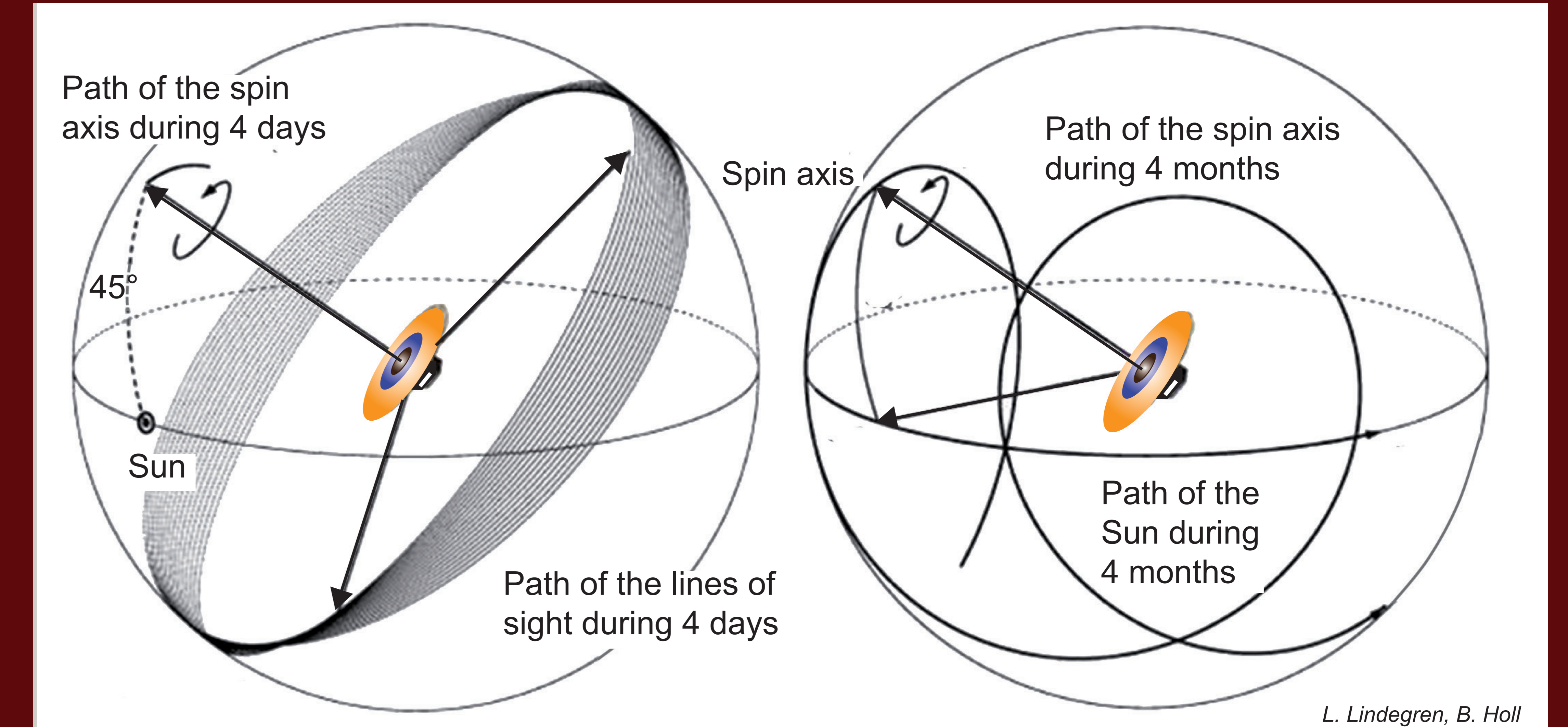
B. Holl

The rotation of Gaia

Gaia completes one full revolution every six hours. Simultaneously the spin axis precesses around the direction towards the Sun at a

constant angle of 45 degrees once in 63 days.

The combination of these motions allows GAIA to scan the entire sky.



L. Lindegren, B. Holl

Primary data

The basic data that Gaia needs to get the position of a star is the time at which the star transits one of the light detectors.

