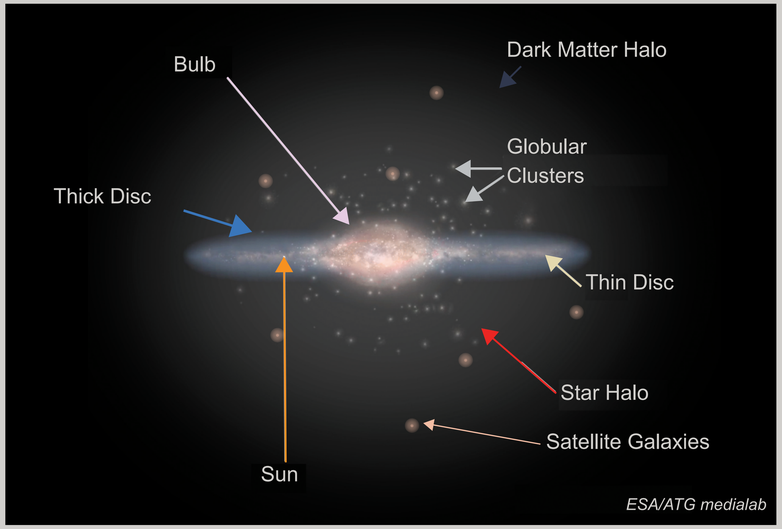
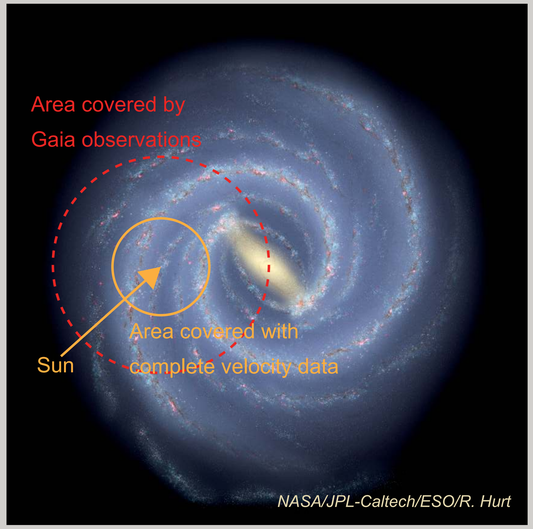
Structure of the Galaxy

Gaia has measured positions and velocities for more than 1000 millions stars in our galaxy and will allow us to build a three dimensional map of the Milky Way and the closest galaxies.

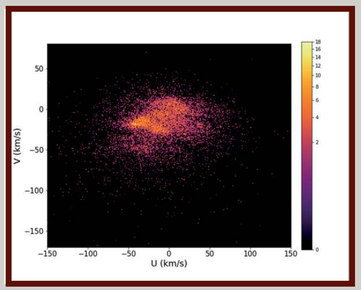




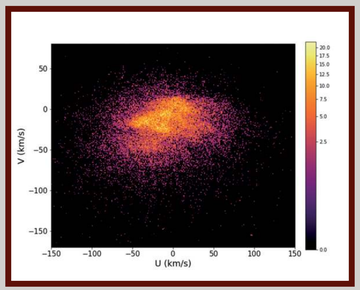
Esquema de l'estructura i components de la nostra galàxia Via Làctia vista de cantó (esquerra) i de cara (dreta). El Sol està situat dins el disc prim.

Velocities of the stars close to the Sun

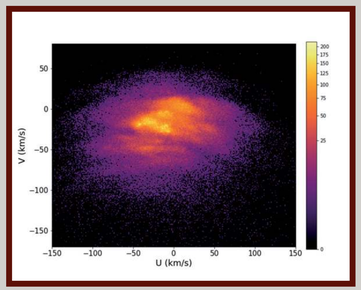
Gaia has discovered many unknown stars around the Sun and has measured the positions and movements of all of them. The precision of the measured velocities is unprecedented. With Gaia data (figure on the right) we have been able to discover that the velocities of stars in the Solar Neighbourhood form groups of fine, arc-shaped structures never observed before (figures below). These structures could be related to perturbations due to the passage of a satellite galaxy close to the disc of the Galaxy.



2009 (Hipparcos + GCS)
12 387 stars



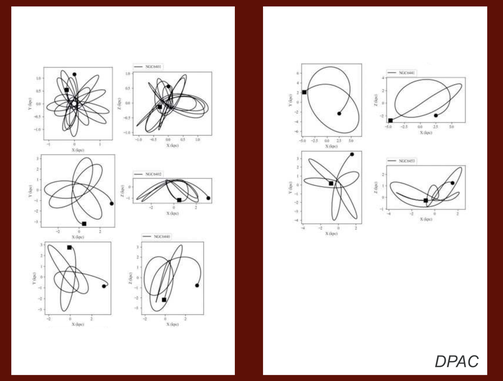
2016 (UCAC + Gaia + RAVE)
37 419 stars



2018 (Gaia)
366 238 stars

Satellite galaxies and globular clusters

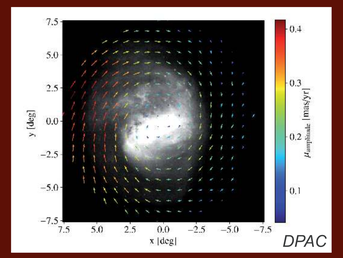
Globular clusters



Gaia has been able to measure positions and velocities of many globular clusters in our galaxy.

Using models, we can move the positions of clusters back in time and trace their orbits in the past. We can see how the clusters move inside the halo of the Milky Way and can follow very different orbits.

Large Magellanic Cloud



The stars in a disc-shaped galaxy like the Milky Way, orbit around its centre.

Gaia has been able to measure the circular movement of the stars in the Large Magellanic Cloud, represented with arrows in the figure.

Satellite dwarf galaxies

Our galaxy has several smaller galaxies orbiting around it.

With Gaia data we have been able to calculate their orbits.