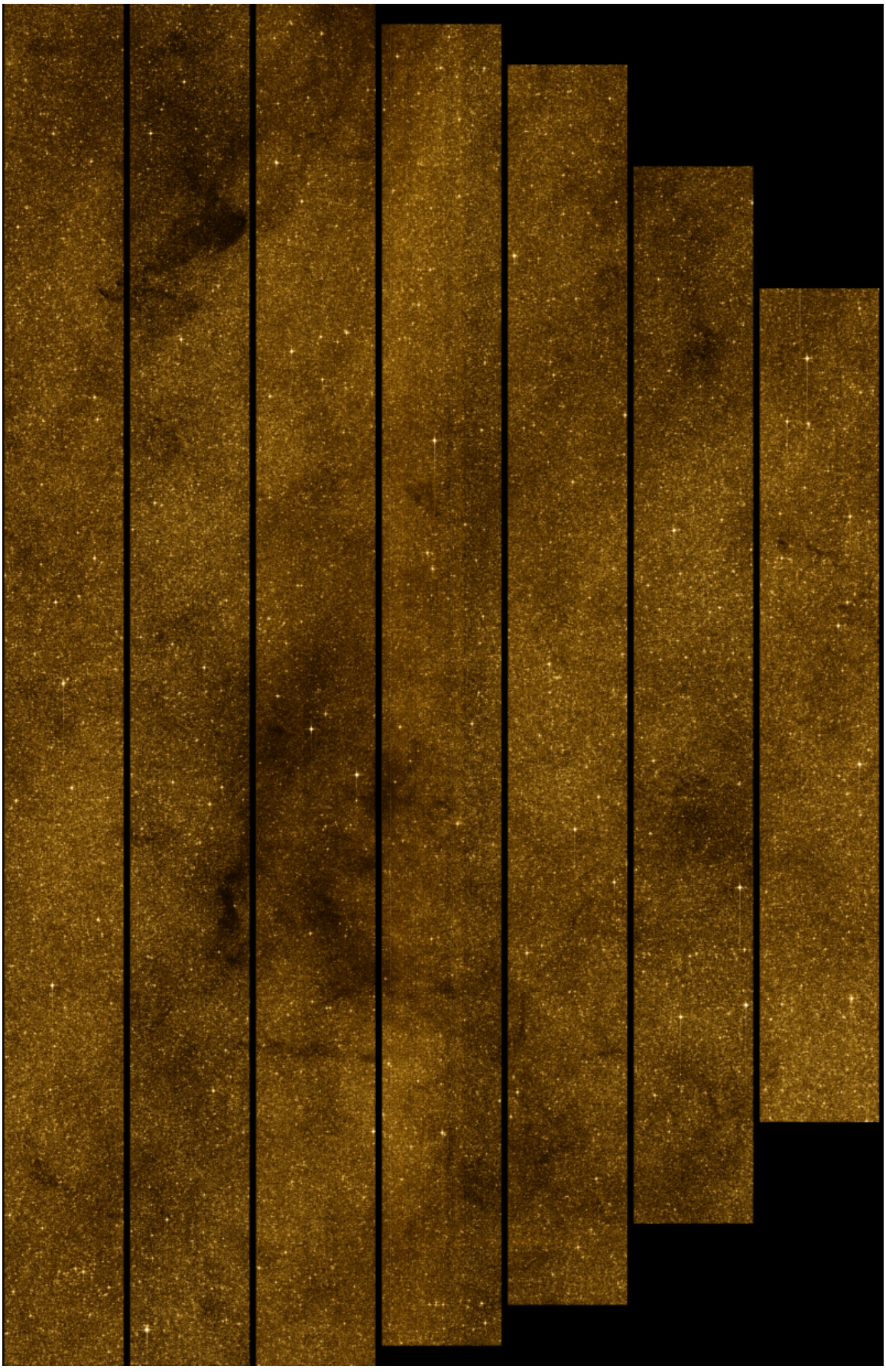
Gaia sky mapper image near the galactic center

September 4 2017



Credit: ESA/Gaia/DPAC, CC BY-SA 3.0 IGO

Gaia, ESA's billion-star surveyor, is detecting stars and measuring their properties in order to build up the most precise 3-D map of the Milky Way. By accurately measuring the motion of each star, astronomers will be able to peer back in time to understand the Milky Way's history, its evolution and its destiny.

In general, as Gaia registers stars, only data covering the object of interest are transmitted to the ground. However, in the densest regions on the sky there are more stars close to each other than the detection and processing system of Gaia can cope with, which could result in a less complete census in these crowded areas.

To help mitigate this, a scientific selection of high-density regions is made to cover them in a special imaging mode, as illustrated here. These types of observations are carried out routinely every time Gaia scans over these regions.

The image, taken on 7 February 2017, covers part of the Sagittarius I Window (Sgr-I) located only two degrees below the galactic centre. Sgr-I has a relatively low amount of interstellar dust along the line of sight from Earth, giving a 'window' to stars close to the galactic centre.

The stellar density here is an incredible 4.6 million stars per square degree. The image covers about 0.6 square degrees, making it conceivable that there are some 2.8 million stars captured in this image sequence alone.

The image appears in strips, each representing a sky mapper CCD (see this animation of how Gaia's camera works). The image has been lightly processed to bring out the contrast of the bright stars and darker traces of gas and dust. Zooming in reveals some imaging artifacts relating to the CCDs, including some vertical striping, as well as short bright streaks indicating cosmic rays. Analysis of these images will only start once the effort required by the routine data processing allows.

Gaia's first catalogue of more than a billion stars, based on the first 14 months of data collection, was released in September 2016. The next release is targeting April 2018, with subsequent releases foreseen for 2020 and 2022.

Provided by European Space Agency

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