

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND
SOLAR-SYSTEM SCIENCE MISSIONS (A7)

Scientific Motivation and Requirements for Future Space Astronomy and Solar System Science Missions (1)

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GAIA SPACECRAFT IN-ORBIT COMMISSIONING STATUS

Abstract

Gaia, an ESA science cornerstone mission, aims at producing an extraordinarily precise stereoscopic and kinematic census of one billion stars down to 20 magnitude in our Galaxy and throughout the Local Group. These data combined with astrophysical information provided by on-board multi-color photometry provide the precision necessary to quantify the early formation, and subsequent dynamical, chemical and star formation evolution of the Milky Way Galaxy. Gaia implements the proven principles of ESA's Hipparcos mission, with an astrometry accuracy improved by a factor of 200. To achieve Gaia's ambitious mission goals, the spacecraft contains a number of novel solutions for the large astrometry and photometry optics sharing a common giga-pixel focal plane, for the onboard metrology systems, for the on board instrument data processing chains as well as for the service platform which ensures an utmost stable environment for science observation. Airbus Defence Space started the Gaia spacecraft development contract in March 2006. The satellite was launched in December 2013, reached its operational orbit one month later, and completed the in-orbit commissioning operations mid of 2014. This paper describes the Gaia spacecraft, recalling the main design features and providing the most significant commissioning results and expected in-orbit scientific performances.