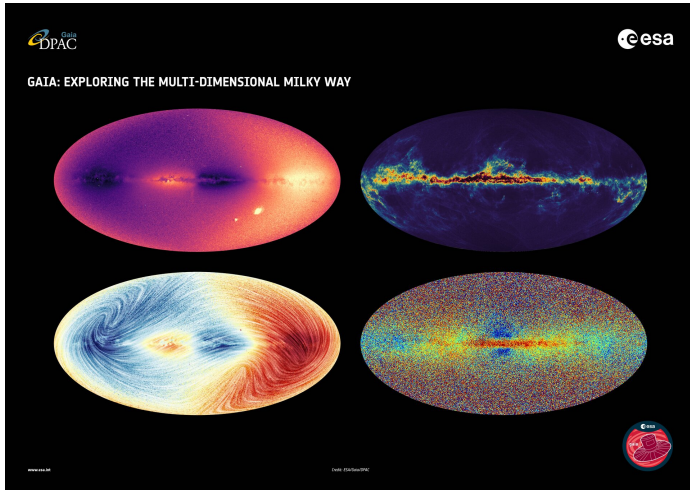


Dormant compact objects

Use of data from GAIA to verify stellar evolution simulator SEVN



GaIA mission

Gaia is an ESA operated telescope, performing a survey of the sky from Earth orbit to create the largest, most precise, three-dimensional map of our Galaxy. The data gathered includes high-precision measurements of positions, distance and proper motions— of more than one billion stars in our Milky Way galaxy. revealing the composition, formation and evolution of the Galaxy.

A binary star with an invisible companion will display different kinematics than a single star, but we're unable to see the companion meaning it has to be a dormant compact object: either a black hole, white dwarf or neutron star.

SEVN simulator

SEVN is a stellar population synthesis code developed by 'Formation and Dynamics of Stars' (ForDyS) research team at the Astronomical Observatory of Padova. The simulator uses hydro-dynamics to model the initial stars, and the dynamics of them to simulate the evolution of stars and binary systems and is written in C++.

Work so far

Thus far the work has been encompassing seeking out the correct initial conditions to model the Milky Way, so we can simulate what the galaxy should look like today. Achieving this lets us filter out for binary kinematics, letting us confirm by comparing the simulated results with the Gaia data, that it is a dormant companion. The next step is to categorize what the companion is.