The Little Books of Gaia

A 3-D TOUR OF OUR GALAXY

June 2009

Hipparcos and Gaia

In 1989, the European Space Agency launched Hipparcos, a satellite that has revolutionised our knowledge of the Galaxy to which we belong, the Milky Way. It measured very precise distances and positions of stars near the Sun to create a three dimensional picture of that region of the Galaxy. The stereoscopic images shown here have been created using data from the Hipparcos mission. ESA plans to launch, in spring 2012, a satellite called Gaia which will also measure distances and positions of stars, but now to much higher accuracy and including stars right across our Milky Way and beyond.

How to view the 3-D images

Each pair of images in this booklet represents a star field of about 6 by 6 degrees. For viewing these images in three dimensions with the "fused" free-eye imaging method, the following recommendations may help. View the page from a distance of about 30-50 cm under good and uniform lighting conditions. Focus on the images, but "relax" the eyes so that they converge at infinity (imagine that you are staring through the paper at a distant point, so that the left eye observes and focuses on the left image, while the right eye focuses on the right image). Fix on a particular object until the depth effect appears: when it does, the results are dramatic.

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More detailed information can be found on the Gaia web site: http://sci.esa.int/Gaia

Arcturus

Arcturus lies at a distance of about 36 light years. It is the brightest star of the northern hemisphere and the fourth brightest star in the entire sky. In Greek, Arcturus means "Guardian of the Bear", a name given to this star because of its proximity to the Ursa Major (Great Bear) constellation. Arcturus belongs to the Bootes constellation, which forms a kite-shaped pattern in the sky.

The easiest way to find Arcturus is to start with the Big Dipper (the Plough). Follow the handle of the Big Dipper as it arcs and keep going until you come to a bright star. That's Arcturus. "Follow the arc to Arcturus", as the old stargazer's saying goes.

Pleiades

The Pleiades cluster lies at a distance of about 375 light years and is around 100 million years old. This is very young as far as star ages are concerned. Our Earth is much older, with an estimated age of 4500 million years. The Pleiades belongs to the zodiacal constellation Taurus. It contains a large amount of dust and several hundred stars, of which only 6 or 7 are visible to the naked eye.

In Greek mythology, the Pleiades were 7 sisters (Alcyone, Maia, Electra, Merope, Taygete, Celaeno, and Sterope), daughters of Atlas and Pleione. The great hunter Orion was in love with the young women and pursued them for many years. Zeus eventually converted them into doves to help them escape, and they flew into the sky forming a cluster of stars.

Praesepe

The Praesepe cluster lies at about 587 light years and has an estimated age of 650 million years. Praesepe is commonly referred to as the "Beehive" cluster, because its round and fuzzy shape reminds us of a swarm of bees. It is easily visible to the naked eye, and thus known since ancient times. Praesepe is made up of about 100 stars and lies at the center of the Cancer constellation.

★ A cluster is a group of typically 100 stars that are gravitationally bound and that were born at the same time, with a given chemical composition.