GAIA HISTORY

Gaia-Building on the Legacy of Hipparcos

00:00:10

When our ancestors first looked up into the night sky; they must have wondered at the band of stars and diffuse light crossing the heavens above them. It probably looked like a distant constellation. But we now know that our planet, Earth, is part of this constellation - known as the ‘Milky Way’.

*Images – timelapse nighttime sequence from the* radar station DIANE shot in Kourou, oct 2013

00:18

But it’s only through the science of Astrometry, the measuring of the distances and movements of stars, that we are able to map out our place in our galaxy and - by extension - in the universe.

The Greek astronomer Hipparchus was the first to Map the Milky Way:

*Images - moving out from our solar system out to the Milky Way from the report Galactic centre through Integrals eyes Oct 2012 then close up of stars moving to wider shot from ‘Gaia mapping the milky way june 2013’*

**00:42**

**ITW:** Giuseppe Sarri ,Gaia Project Manager

**shot in Astrium September 2013**

***“2 thousand years ago he made the first catalogue of stars which was an important catalogue which was there up to the middle ages, and he did with the naked eyes therefore it was really impressive, he could go to magnitude six, and then with the development of the telescope, with Galileo, astronomers could measure more and fainter stars and with higher precision”.***

01:16

While Hipparchus mapped one thousand objects and chartered them on the sky; by the end of the 16th century another astronomer, [Tycho Brahe](http://en.wikipedia.org/wiki/Tycho_Brahe), created a catalogue of a thousand stars with a factor of precision 180 times better than what was done by Hipparchus.

Images –Drawing of Hypparchus and sexton on map *milky way , then greek temple with stars and grid of stars – all from Hipparcos –science update May 97 report.*

01:34

More recently, in 1967, a Frenchman called Pierre Lacroûte revived astrometry with the proposal to place a telescope on a satellite above the Earth's atmosphere. In 1980, realizing the importance to science of this idea, ESA decided to endorse this project which would eventually be called Hipparcos. The expectations of the Hipparcos satellite at the time were high.

*Cut aways of Pierre Lacroute at the launch of hipparcos room, then an animation of Hipparcos Orbit, from Hipparcos –science update May 97 report.then hipparcos in clean room from Hipparcos-the star machine' 1989:.*

**01 :51**

**Pierre Lacroute - Astrophycisist ,**

**J’avais pensé vraiment qu’il y avait quelque chose à faire dans l’espace pour l’astrométrie et on travaillé pour imaginer des méthodes et ensuite l’agence spatiale a relevé le projet pour ensuite le transformer avec l’aide de nombreux astronomes, d’ingénieurs et c’est devenu le projet très performant d’Hypparcos**

 **I really thought that there was the possibility of doing something in space with astrometry,, and we worked hard to imagine what methods could be used and then the Space Agency took up the project and then after many astronomers and engineers worked on it, it became the highly successful Hypparcos project. »**

***covered with images of mapping the sky from hipparcos science update May 1997 report***

02:16

The launch of Hipparcos in August 1989 marked a major step forward in astrometry – one that produced results about ten thousand times more accurate than those of [Tycho Brahe](http://en.wikipedia.org/wiki/Tycho_Brahe) four hundred years before. By placing a telescope in Space ESA was able to measure the position of stars without the distortion Earth’s atmosphere, which had previously deformed measurements taken from the surface of Earth.

*Launch of Hipparcos from Hipparcos –science update May 97 report.and animation of Hipparcos launch and deployment from Hipparcos-the star machine' 1989:.*

02:41

Four years after its launch, Hipparcos exceeded all expectations by producing a million bits of information which, after being received by ground stations in Germany, Australia, and the United States; went into the biggest computation in the history of astronomy to produce the “Hipparcos and [Tycho catalog](http://en.wikipedia.org/wiki/Hipparcos_Catalogue)ues”. These catalogues of measurements pinpointed the position of more than one hundred thousand stars to high precision and more than one million stars to lesser precision and, as predicted, became the reference for astronomers for the last 15 years.

*Images of scientists in front of computers and animation from Hipparcos-the star machine' 1989, then scientists in front of computers and scientist using Tycho catalogue, both from Hipparcos –science update May 97*

*03:17*

But now it’s time for ESA’s new Astrometry mission, Gaia, to build on the legacy. By harnessing advances in technology to build the largest CCD optical plane and the most stable casing to date, Gaia will be able to see ten thousand times as many objects as Hipparcos. It will produce the most extensive and accurate catalogue of the objects in our Milky way -100 times more accurate and all-encompassing than that produced by Hipparcos. This will allow astronomers to create a new map that will massively improve our understanding of our Galaxy the Milky Way, how it has evolved in the past and how it will evolve in future.

*Images of Gaia in Kourou Oct 2013 then animations of Gaia with close up of interior, then scanning the sky, all from Astrium and ESA 2013 , then Starry night from XXM Newton 10 years 2010 then end on zoom out from universe image from, Gaia mapping the universe june .2013*

03:57

B-Roll

**03 :57 - : ITW - Pierre Lacroute, Astrophysicist– Talking about the realization of a dream and how Hipparcos was acheived. And images from before and after in original report. (French)**

**04:45 - ITW:** Giuseppe Sarri ,Gaia Project Manager

**shot in Astrium September 2013 (English)- the history of Astrometary.**

**06 :29 Animations of Hipparcos x 4**