Vega 1 returns images of Halley's Comet, March 4, 1986

Jessica MacNeil - March 04, 2019

Vega 1 was a Soviet space probe launched by a Proton 8K82K rocket from Baikonur Cosmodone on December 15, 1984. Its twin spacecraft Vega 2 was launched six days later.

The mission included a Venus swingby and flyby of Halley's Comet, where it would return images and data to learn more about it.

Powered by twin large solar panels, Vega 1 carried instruments including an antenna dish, cameras, spectrometer, infrared sounder, magnetometers, and plasma probes (see a photo of the Vega model on display at the Smithsonian at right). Weighing 4920 kg, the three-axis stabilized spacecraft was also equipped with a dual bumper shield for dust protection from the comet. Its design was based on the previous Venera 9/10 missions.

Vega 1 traveled to the vicinity of Venus, arriving in June 1985, and deployed a descent module toward the surface before retargeting toward Halley's Comet using Venus gravity field assistance. The lander returned valuable data about the atmosphere and soil of Venus.

The spacecraft began returning images of the comet on March 4, 1986 (see photo). The images were used to plan a close flyby of the comet by the Giotto spacecraft. They showed two bright areas on the comet, that were believed to be a double nucleus, but turned out to be two jets emitting from the comet. The nucleus appeared to be about 14 km long with a rotation period of about 53 hours.

According to NASA, the images showed a dark nucleus, and the infrared spectrometer onboard measured a nucleus temperature of 300 to 400K, much warmer than expected for an ice body. The data Vega returned led to the conclusion that the comet had a thin layer on its surface covering an icy body. The dust mass spectrometer detected material similar to the composition of carbonaceous chondrites meteorites and clathrate ice.
On March 6, Vega 1 made its closest approach at a distance of 8890 km. Three days later Vega 2 was able to return clearer images as it flew even closer to a distance of 8030 km.

The Vega mission was a multinational mission that involved scientists and instruments from many different nations and marked a new era of international cooperation for the Soviet space program.

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Editor's note: This article was originally posted on March 4, 2014 and edited on March 4, 2019.