



Comet Siding Spring imaged by HRSC on board Mars Express

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Comet Siding Spring came extraordinarily close to Mars on 19 October 2014. The celestial body - a mere 500 metres in diameter - passed the Red Planet at a distance of just 137,000 kilometres, where it was observed by several spacecraft in orbit around Mars. The High Resolution Stereo Camera (HRSC), operated by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR), also acquired a series of images with its super-resolution channel (SRC) during Mars Express orbit 13,710.

As it flew by, Siding Spring was travelling at a velocity of around 56 kilometres per second relative to Mars. Images were acquired at 171-second intervals; the spatial resolution is 17 kilometres per pixel. The images show the comet nucleus as well as the surrounding dust and gas cloud (coma).

Comet Siding Spring originates from the Oort Cloud, a comet 'reservoir' in the outer reaches of the Solar System. The comet was named after the Australian Observatory at which it was originally discovered back in 2013, and has the scientific designation C/2013 A1. As comets approach the Sun, one or two tails composed of gas and dust or ionised gases form on the side facing away from the Sun. As it whizzed by the planet, Siding Spring's tail penetrated the Martian atmosphere, where it was analysed by the particle detector ASPERA-3 on board the ESA Mars Express spacecraft, among others. Scientists hope to use the data acquired, as well as the spectrometer measurements conducted at the same time, to gain an insight into the comet's composition. It is thought that comets may contain material dating back to the formation of the Solar System.

The HRSC experiment

The High Resolution Stereo Camera was developed at DLR and built in collaboration with partners in industry (EADS Astrium, Lewicki Microelectronic GmbH and Jena-Optronik GmbH). The science team, which is headed by principal investigator (PI) Ralf Jaumann, consists of 52 co-investigators from 34 institutions and eleven countries. The camera is operated by the DLR Institute of Planetary Research in Berlin-Adlershof.

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Flyby of Comet Siding Spring



This animation combines multiple images that were acquired by the High Resolution Stereo Camera (HRSC) operated by DLR on board ESA's Mars Express spacecraft. The speed of Siding Spring relative to Mars during the flyby was approximately 56 kilometres per second. The images were acquired at intervals of 171 seconds and have a resolution of 17 kilometres per pixel. The animation reveals not only the nucleus of the comet, but also the coma, made up of dust and gas, that surrounds it.

Credit: ESA/DLR/FU Berlin.

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