Mini-radar for asteroid CubeSat

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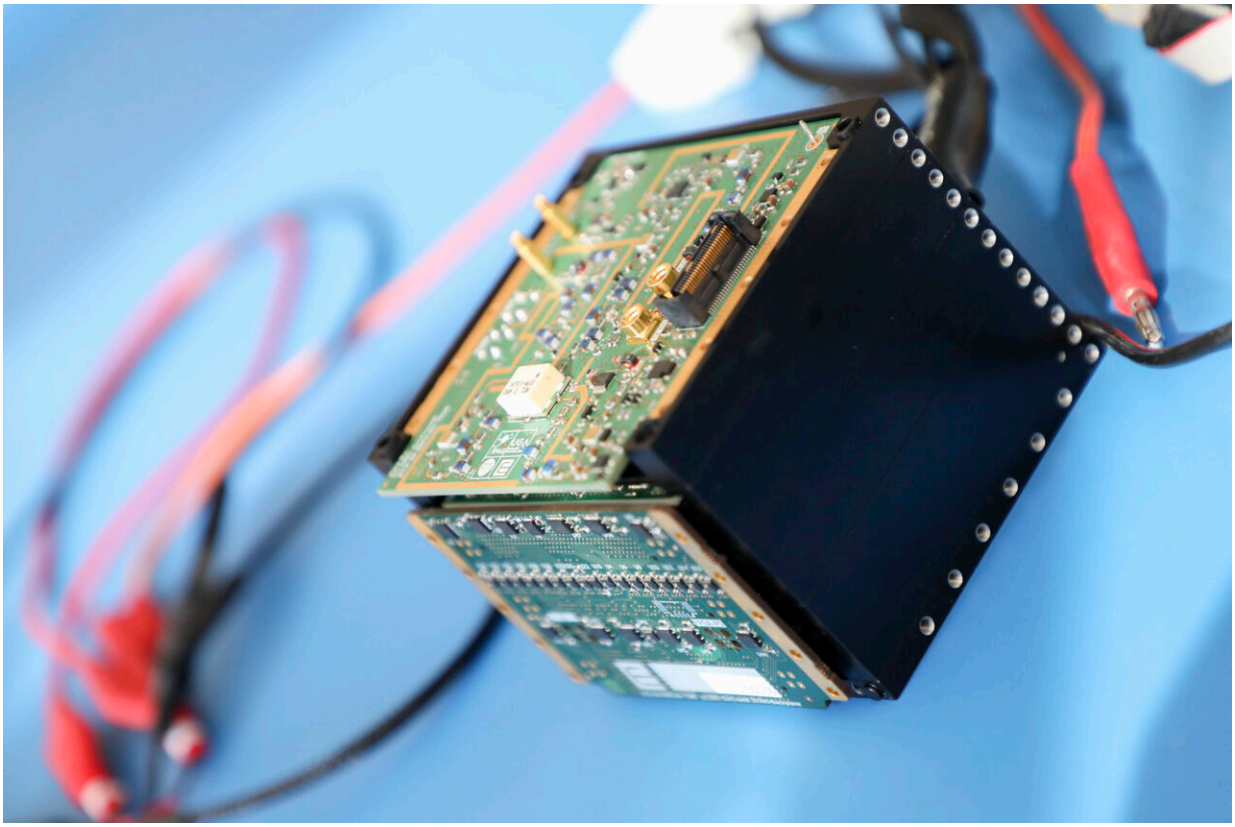

Credit: JuRA Team / UGA

This 10-cm box will make history as the smallest radar instrument to be flown in space—and the very first radar to probe the interior of an asteroid. Its target? The Dimorphos asteroid, which on the night of 26 September had its orbit diverted and a vast 10,000 km plume sent out into space by collision with NASA's DART mission.

This radar instrument, connected to a quartet of 1.5 m-long antenna booms, will be flown aboard the aircraft-carry-on-sized Juventas CubeSat, which will in turn be flown to Dimorphos aboard ESA's Hera spacecraft, due to be launched in two years' time.

Hera—currently taking shape at OHB in Germany and Avio in Italy—will fly to Dimorphos to perform a close-up survey of the aftermath of the DART impact, gathering key information such as the size of DART's crater, the mass of Dimorphos as well as its make-up and internal structure. Hera's extra data will help turn the DART deflection experiment into a well-understood, repeatable technique that might one day be needed for real.

And in fact, Hera is not one spacecraft but three: it carries with it ESA's first deep-space CubeSats to make extra observations of its asteroid target. The radar-hosting Juventas will be accompanied by Milani, which will survey the composition of Dimorphos's surface and dust.

This "JuRa" instrument is a miniaturized version of the radar flown aboard ESA's Rosetta comet mission and used to probe beneath the black surface of comet 67P/Churyumov–Gerasimenko. It was developed by Dr. Alain Hérique's group at the Institut de Planétologie et d'Astrophysique de Grenoble (IPAG) at the Université Grenoble Alpes and Dr. Dirk Plettemeier's group at Technical University Dresden, together with Emtronix in Luxembourg responsible for manufacturing the instrument.

Provided by European Space Agency