

## **Goonhilly antenna goes deep space**

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Ground station engineering teams at ESA are particularly excited by a new initiative aimed at redeveloping part of Goonhilly Earth Station, an existing commercial ground tracking station located in Cornwall, UK, to enable it to provide Europe's first deep-space tracking services on a commercial basis. Credit: GES - Goonhilly Earth Station Ltd

Until now, if you're an entrepreneur planning future missions beyond



Earth, you'd have to ask a big space agency to borrow their deep-space antennas. Now, thanks to the UK's county of Cornwall and ESA, you'll have a commercial option, too.

If you're planning on flying a robotic or even human <u>mission</u> in the near future to the Moon, an asteroid or even Mars, one indispensable requirement you'll face is the need for at least one deep-space tracking dish to communicate with your craft.

Today, however, there's no commercial deep-space service available to rent for your specific mission needs – and building a new station from scratch all on your own is rather pricey.

## **Exploration mission needs growing**

ESA has three deep-space dishes, in Australia, Spain and Argentina, providing full-sky coverage for tracking and communicating with missions like Mars Express, Gaia and ExoMars.

Later this year, they will add the new BepiColombo mission to Mercury and, in the near future, ESA's Solar Orbiter, Euclid and Cheops.

"The amount of science data flowing in from ESA's current missions, not to mention from future missions with improved instruments, is growing strongly," says ESA's Pier Bargellini, responsible for network operations.

"By the middle of the next decade, ESA's deep-space communication needs for supporting today's missions, like ExoMars, and upcoming spacecraft, like Juice, is expected to exceed our present capacity by around half.







Artist's impression of the BepiColombo spacecraft at Mercury. The mission comprises ESA's Mercury Planetary Orbiter (foreground) and JAXA's Mercury Magnetospheric Orbiter (background). Credit: Spacecraft: ESA/ATG medialab; Mercury: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington

"We are considering urgently how to bridge this gap."

## **Developing commercial capacity**

This is why ESA engineering teams are excited by a new initiative aimed at redeveloping part of Goonhilly Earth Station, an existing commercial station in Cornwall, UK, to enable it to provide Europe's first deep-space tracking services on a commercial basis.

Under the project, a 32 m-diameter dish built in 1985 will be upgraded to provide fast data links for missions far beyond Earth – typically exceeding 2 million km.

## Linking up

Test links will be made with ESA missions such as Mars Express, one of the first times an Agency mission communicates with a non-ESA, non-NASA station from another planet.





Credit: GES - Goonhilly Earth Station Ltd.

The project will be initially funded through a €9.5 million investment from the UK's Cornwall & Isles of Scilly Local Enterprise Partnership, a public–private regional economic development body, and will later include a smaller investment from ESA.

"Once the station upgrade work is complete, in about 24 months, Goonhilly will be able to complement ESA's own stations, and provide deep-space tracking for the Agency's missions as well as those of other space agencies or from private space start-ups aiming to exploit the Moon or mine asteroids," notes Klaus-Jürgen Schulz, responsible of ESA ground station engineering.



Goonhilly, established in 1962 and at one time the largest satellite <u>station</u> in the world, with over 60 dishes of varying size, is well known in the UK. Its antennas have brought iconic images to UK TV viewers, including Muhammad Ali fights, the Olympic Games, the Apollo 11 Moon landing and 1985's Live Aid concert.

"Upgrading Goonhilly and building up a commercial capability to support future exploration missions is good for ESA and good for European science and industry," says Rolf Densing, ESA's Director of Operations.

"It's also excellent value for European taxpayers."

Provided by European Space Agency

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