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Space exploration

BepiColombo probe prepares for its first fly-by of Mercury

Will Gater

THE European and Japanese mission BepiColombo will make a fly-by of the solar system's innermost world on 1 October, diving to just 200 kilometres above the surface of sun-scorched Mercury.

This will be the first of six fly-bys, which will lower BepiColombo's speed and help set up the spacecraft for getting into orbit around the planet in December 2025.

"To be able to see our target up close for the first time during the [October] fly-by will be really special," says Emma Bunce at the University of Leicester, UK, who is principal investigator of the Mercury Imaging X-ray Spectrometer instrument on BepiColombo.

BepiColombo's main cameras – which will be used for imaging from orbit – won't be able to photograph Mercury during the fly-by, because they will be blocked by part of the spacecraft. But the mission also carries "monitoring" cameras for keeping tabs on BepiColombo itself, which will capture images of the planet.

Eleven instruments will gather data during the fly-by, measuring Mercury's magnetic field and the tenuous veil of material surrounding the planet, known as an exosphere. The mission will also attempt to detect dust particles as it swoops by, which could tell us about material being blasted off the surface by impacting meteoroids. These would be the first ever measurements of dust near Mercury, says Joe Zender, the BepiColombo deputy project scientist at the European Space Agency.

Following October's fly-by, BepiColombo's next close encounter with Mercury will be in June 2022. Once in orbit, the mission will split into two spacecraft that will conduct an investigation of the magnetic fields enveloping the tiny world, and of the planet's composition and geological history. ■

Analysis Commercial space flight

Fewer eyes on the sky As space tourism takes off, it is no surprise that we see far less of private trips than we did of the journeys of government astronauts, says Leah Crane



ON 18 September, the Dragon spacecraft carrying SpaceX's Inspiration4 mission splashed down safely in the Atlantic Ocean after three days in orbit. None of the four passengers aboard the flight – which was paid for by billionaire Jared Isaacman – was a government-trained astronaut, a first in the history of orbital space flight. By all accounts, the flight was a resounding success, but some have lamented that, unlike with most NASA missions, very little of it was broadcast live.

During the radio silence, some observers pointed to the fact that Netflix is due to release a documentary with footage from the mission, which may limit what could be broadcast live. After landing, Isaacman tweeted to say that the lack of live video was due to limited access to ground stations, which prioritise NASA missions.

Not being able to watch the mission live marks the beginning of a change in how much access the public has to activities in space. Such endeavours have often been presented relatively transparently, at least by NASA and the European Space Agency, in part because they have usually been mostly funded by taxpayers.

The privately funded nature of this mission changes expectations, says space analyst Laura Forczyk. "Yes, this mission is something brand new, and yes we're used to seeing government broadcast because it's taxpayer dollars and transparency is important, but this is a private mission," she says.

While this flight did use some government infrastructure, most notably a launchpad at NASA's Kennedy Space Center in Florida, the rocket, crew capsule and crew training were all provided by SpaceX and paid for by Isaacman.

8 Number of space tourists before 2021

"As this becomes more common, I can't imagine that we as a public should expect to see someone's private vacation," says Forczyk. "Would you or I decide to broadcast our three-day vacation, especially if it's a once-in-a-lifetime thing?"

The answer to that is obviously no, but an average person also wouldn't spend months publicising their holiday beforehand. Much of that publicity centred on the mission's goal to raise awareness

The first all-amateur crew aboard SpaceX's Dragon spacecraft

and \$200 million for St. Jude Children's Research Hospital in Tennessee.

"The question is, to what extent is this a vacation – a tourist trip – and to what extent is this a fundraising mission for St. Jude," says Jonathan McDowell at the Harvard-Smithsonian Center for Astrophysics in Massachusetts. "If it's a fundraising mission, then publicity is part of that mission, but if it's just a fig leaf for 'a billionaire wants to take three friends on a vacation in space' then there's some mixed messaging going on."

There is precedent for space tourists maintaining a certain level of privacy about their trips, even when they have purchased their seat on a spacecraft from government agencies rather than private companies. Before this year, seven tourists had travelled to the International Space Station and one spent a week on Mir, the Russian space station.

"All those people who went to Mir and the International Space Station in the early 90s, they were open about their voyage but they didn't have constant live streaming," says McDowell. "So if you as Jared Isaacman are thinking about yourself as following in their footsteps, he's giving a lot more than they did."

As private space flight becomes more common in the coming years, it seems likely that even the public will come to see it more as a luxury trip for the super-wealthy rather than a collective achievement. And while it is normal to publicly broadcast a collective achievement, holidaymakers tend to prefer their privacy. ■