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Space tourism

Who gets to be an astronaut?

Commercial space travellers will have to work harder to get their US astronaut wings, reports **Leah Crane**

SPACE tourism is ramping up with the recent flights to space of billionaires Richard Branson and Jeff Bezos aboard their respective firms' craft, but not every person who makes the trip is officially considered an astronaut. The US Federal Aviation Administration (FAA) has tightened its rules for how it awards astronaut wings to those riding on private space flights, making it harder to become an official commercial astronaut.

What are FAA astronaut wings?

In the US, there are three agencies that designate people as astronauts: the US military, NASA and the FAA. The first two give wings solely to their own employees, so the only way to be officially recognised as an astronaut after a flight on a commercial spacecraft is to be awarded wings by the FAA. They don't come with any particular privileges beyond bragging rights though.

What are the rules to be certified as a commercial astronaut now?

For the FAA to award wings, an astronaut must be employed by the company performing the launch, so tourists who have bought tickets are out. They must also go through training to be certified by the FAA as an astronaut and fly higher than 80 kilometres. And they must have "demonstrated activities during flight that were essential to public safety, or contributed to human space flight safety", according to the new order providing the guidelines.

What counts as a contribution?

Whether a crew member has made a contribution to space flight safety is up to the discretion of FAA officials.

Over the past decade, the agency has awarded astronaut wings only to the pilots of spacecraft – the one exception was Beth Moses, a Virgin Galactic executive who flew aboard

"Astronauts must have demonstrated activities during flight that were essential to public safety"

the company's SpaceShipTwo craft in 2019. The main criteria seems to be that the astronauts must be designated as crew members performing some task aboard their flights, not simply passengers.

So will the passengers on the recent Virgin Galactic and Blue Origin flights be considered astronauts? That's a bit complicated. Virgin Galactic designated Branson and the other three passengers

From left: Oliver Daemen, Wally Funk and Mark Bezos (Jeff's brother) in microgravity

on his 11 July flight as crew members testing the spacecraft, but it's not clear whether they "contributed to human space flight safety" in general.

Things are more clear-cut in the case of the 20 July Blue Origin flight, as the spacecraft was entirely controlled from the ground, not by Bezos or any of the other three passengers – all they had to do was enjoy the ride. That means that they wouldn't qualify for astronaut wings under the FAA's new rules.

Are there any exceptions?

The agency can give honorary wings to "individuals who demonstrated extraordinary contribution or beneficial service to the commercial human space flight industry", but who didn't satisfy the other eligibility requirements. So Wally Funk, a passenger on the Blue Origin flight who trained to be an astronaut in the 1960s but didn't get to go to space back then, may still get her wings. ■



BLUE ORIGIN

Conservation

Sucking DNA out of the air reveals which animals live nearby

Michael Le Page

MONITORING wildlife in terrestrial ecosystems might be made easier and cheaper using a new technique that involves vacuuming bits of DNA out of the air, two teams have independently shown.

"This could have a profound impact on a lot of different fields," says Elizabeth Clare at York University in Toronto, Canada.

Looking at which aquatic animals are present by searching for so-called environmental DNA, or eDNA, in water has already had a massive impact on fisheries and conservation, says Clare. It has also helped detect rare species.

When Clare did a recent report on eDNA, she initially wrote that it could be detected in air as well as in water and soil, because she assumed that it could. But when she went looking for references to back this up, all she found was one Japanese high school project. So Clare and her team decided to try it out for themselves.

Meanwhile, Kristine Bohmann at the University of Copenhagen in Denmark had come up with the same idea. After initial lab experiments, both teams field-tested the approach in zoos where the animals present are known.

Bohmann's team sucked up air through fine filters at various sites in Copenhagen Zoo and then analysed the samples using the eDNA techniques developed for water or soil samples.

They detected DNA from animals in outside enclosures up to 300 metres away from the sampler ([bioRxiv, doi.org/gk9ccf](https://doi.org/gk9ccf)).

In tests at Hamerton Zoo Park in the UK, Clare's team got very similar results, also identifying local wildlife as well as zoo residents ([bioRxiv, doi.org/gk9ccg](https://doi.org/gk9ccg)).

Several groups are already planning on trying out this approach for monitoring biodiversity in wilderness areas, says Clare. ■