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## Starliner and Starship propel space industry into a new era

SpaceX successfully launched its Starship rocket the day after Boeing's Starliner craft made its first crewed flight, a sign that the space industry is hotting up, says **Leah Crane**

SPACE flight is having a renaissance. Two rocket launches on 5 and 6 June demonstrated the capabilities of relatively new spacecraft, each representing a crucial step forward for human space exploration.

Boeing's Starliner capsule made its first crewed flight, taking two NASA astronauts to the International Space Station (ISS). The next day, SpaceX's huge Starship rocket made its fourth test flight, the first orbital flight it has fully executed without anything falling apart or exploding.

"Nothing blew up, so it was a really good day for space flight progress," says Laura Forczyk, an independent space industry consultant. She says the successes showcase the fact that we are operating in two different domains: sending humans to orbit, and moving quickly towards sending humans to the moon and beyond.

With this launch, Starliner joins SpaceX's Dragon class of spacecraft as a second option to carry US astronauts to the ISS. This marks the first time any country has had more than one active orbital spacecraft that could safely carry crew, a key achievement for NASA.

It is a striking change in a relatively short period of time. After the space shuttle programme ended in 2011, NASA had no other option but to rely on Russian spacecraft to fly US astronauts to the ISS, which continued until 2020.

"The US has had a strained relationship with Russia, so what we had was an adversarial relationship with a space flight partner on the ground, but still had to rely on them to get our astronauts to space," says Forczyk. "We want to have that capability independently, and we don't want to lose it if something went wrong with one of those spacecraft."

When Starliner docked with the ISS, it was the first time three different crewed vehicles were attached to the station at once. The

other ships joining Starliner are the SpaceX Dragon Endeavour spacecraft and the Soyuz MS-25 crew ship. The busy ISS docks are a sign that the space flight industry is booming.

"It's the maturation of space flight," says Forczyk. "It starts with cargo to the space station, and then humans to the space station, and then commercial space stations and beyond."

Starship's success is a step towards that "beyond". It is the largest, most powerful rocket ever built, intended to eventually loft astronauts to the moon

**Clockwise from below: SpaceX's Starship launch on 6 June; a crowd watching Starship's take-off; Boeing's Starliner approaching the International Space Station; a bell is rung to welcome the Starliner pilots on board**

and Mars. While Starship still isn't reliable enough to carry a crew, the rate of testing and iteration of the craft is incredibly fast.

Delays are still ubiquitous in spacecraft testing because of the complexity of the hardware, but decades of effort are nevertheless coming to fruition. Aside from Starliner and Starship, a series of new spacecraft have flown in the past few years, including many missions to the moon and new orbital rockets around the globe.

This seemingly sudden progress is down to the increased involvement of private industry in space flight, which used to be an endeavour only available to huge national agencies, says Forczyk. "There's pressure [on the commercial space flight side] to develop quickly and become operational and fulfil their contracts and get their return on investment,

so there's speed that wasn't there before," she says. This means it is getting easier and easier to send anything – science experiments, space stations, people – into orbit and further afield.

**3**  
**types of spacecraft have now docked with the ISS at once**

There is also a feedback effect in which each successful flight makes the next flight more likely to be successful and heats up the competition between the dozens of agencies and firms trying to make their mark on the cosmos. Humanity is expanding its reach beyond Earth, and our forays into the universe are beginning to multiply. These two launches are emblematic of that astonishing growth. ■

