
Photo: ESA/NASA
I think I found the
perfect spot for a selfie
- Tim Peake

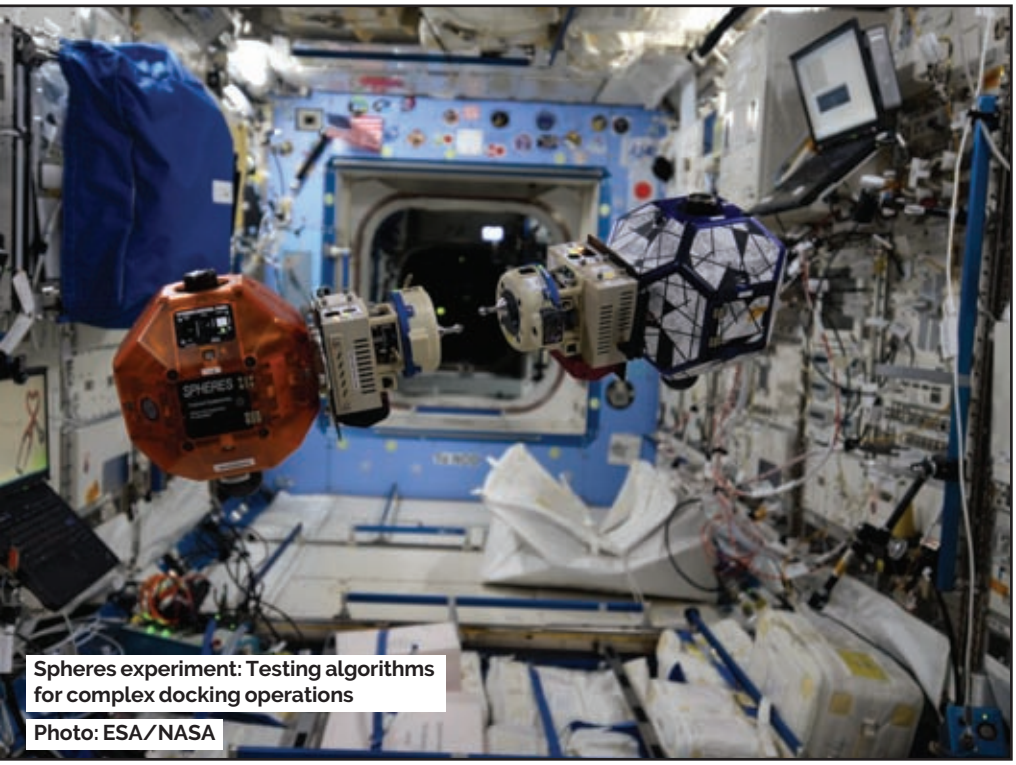
TIM PEAKE
FUTURE SPACE EXPLORATION

ESA astronaut Tim Peake, a former British Army Air Corps officer, gained global renown from his time as a crew member on board the International Space Station (ISS). The first British ESA astronaut, the sixth UK person born in the UK to board the ISS and the seventh person born in the UK to access space, Peake has been a vocal supporter of the UK space industry and its continued development. Amy Saunders met with Tim Peake to discuss the future of space exploration.

NewSpace: With so much going on in the global space industry, it can be hard to keep things in perspective. What's your assessment of where we are in terms of space exploration?

Tim Peake: We've got an awful lot happening in the foreseeable future which is very exciting.

In terms of space exploration and human spaceflight, the International Space Station (ISS) has got an extension now until 2024, which is brilliant, and we're in negotiations about what happens next with that. We're in a period of transitioning towards the commercial space sector, with companies like Axiom Space and its commercial space station, and the Bigelow Space Station, making progress. These are interesting developments in how we're going to continue low Earth orbit (LEO) research and how we're going to move beyond the ISS. LEO will remain a fantastic location for microgravity research for many years to come, and there will of course be a life beyond the ISS.



Spheres experiment: Testing algorithms for complex docking operations

Photo: ESA/NASA

Beyond that, we're also now moving towards an age of deep space exploration. Later this year, the European Space Agency (ESA) will deliver the European Service Module for the Orion spacecraft. This is going to be launched with the Space Launch System (SLS) from the USA, and it's very much a partnership with NASA, Europe and other international partners.

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We're also looking to build the Deep Space Gateway, which is going to cis-lunar space. That gateway is going to provide not only a location for doing deep space research, it's also going to be very flexible with its own power propulsion unit, which will enable lunar surface operations as well as Mars transportation. That really is the next stage; going out from LEO, going back to the moon, and onto Mars.

NewSpace: So, you think it's important that we do go back to the moon?

Tim Peake: Personally, I do. I think that even if we bypass the moon, we would go back there fairly soon. I think these activities will happen more or less in parallel. The moon itself is a fantastic location for research, we've really only scratched the surface. There's a lot of research to be achieved from lunar surface operations, and it's also a great test bed for developing the technologies and techniques we're going to need for long duration stays on Mars, at a relatively safe distance, and a relatively easy distance for resupply.

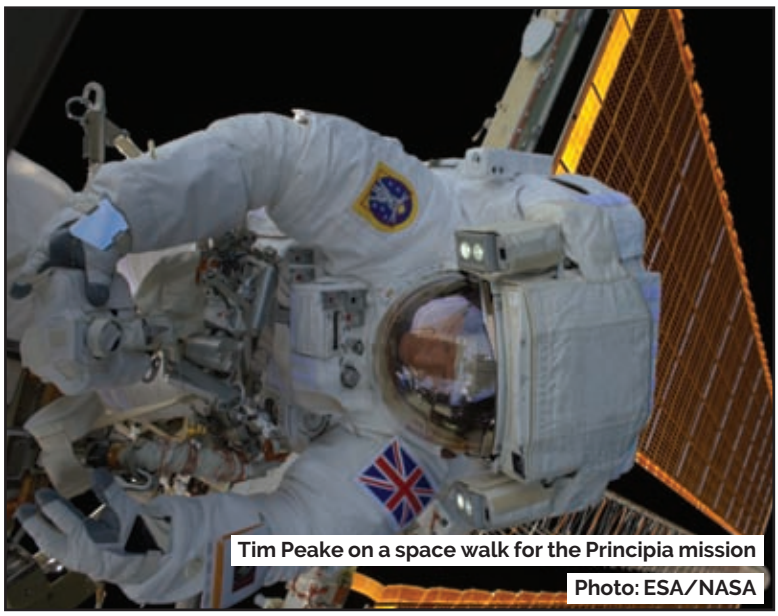
NewSpace: You've been pretty active in promoting STEM subjects in schools for some time now – what more needs to be done to further encourage young people into STEM subjects?

Tim Peake: I think we're starting to do a really good job in the UK, but then, we need to. We're definitely behind

the rest of Europe, particularly when it comes to girls taking up STEM subjects in school. But now, the tide is starting to turn slowly.

I was talking to one of the schools that was involved in my mission, and they went from 9, to 18, to 21 young women taking Physics at A Level, an improvement each year. We're starting to see higher numbers in the STEM subjects now, and there's a whole number of reasons for that. Obviously, the UK government is making a push on STEM subjects right now and has for a number of years now been focused on STEM ambassadorships and trying to promote these activities.

In the UK, we have a skill shortage, and we need graduates with STEM subjects now and will even more so moving forward in the future. We need a good home-grown workforce that is suitably qualified to fill the fantastic array of different careers we have in the space sector.



Tim Peake on a space walk for the Principia mission

Photo: ESA/NASA

NewSpace: There are some in the space and tech industries who are now saying that the arts are every bit as important as STEM, and some are arguing that we should now be moving the focus onto STEAM (science, technology, engineering, arts, and mathematics). How important do you feel the arts are in space and scientific exploration going forwards?

Tim Peake: I don't think it's for me to comment on that, it's all about what the industry needs. At the moment, the industry needs STEM subjects, and we very much need to focus on that so that we have this very high quality, high calibre workforce that means the UK can continue to be at the forefront of these kinds of technologies. Of course, the arts is important; drama, music, literacy. I tried to focus quite a lot on that during my mission, to gain increased interest in space to people across the board. So yes, it's all important, but I do think that certainly STEM is something that we really need to focus on, to get it on the rise again in the UK.

Tim Peake back inside the ISS after almost five hours in space

Photo: ESA/NASA

NewSpace: You've achieved so much in your career so far, and a lot of it very publicly on board the ISS – Can you tell us about your best moments in science?

Tim Peake: In terms of the mission, I would say the spacewalk, definitely. But for my entire scientific career, it's hard to single out one of the 250 experiments I did on board the space station. We worked in so many areas, from material science, creating new metal alloys on the ISS, developing disease-causing proteins and drugs to counter those diseases – that kind of research is fascinating. Within the life sciences, understanding more about our eyesight and our cardiovascular system is truly invaluable. I wouldn't like to pick just one experiment as the highlight of my scientific career. ■

Working on Auxin Transport, a JAXA experiment, for benefit of plant cultivation on Earth as well as in space

Photo: ESA/NASA