

Rebecca:

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Why do we bother sending humans to space? It's hard, it's expensive, and it's dangerous. So why is it worth the risk?

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Well, let's go back a moment. JFK once said, "The exploration of space will continue whether we're involved or not." And so the US and NASA chose to take humankind to the surface of the Moon, a generational achievement. The US won the space race, and that achievement was able to be shared with the world because of Australia's deep space communication complex.

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In fact, the dish has played a pivotal role in space exploration, going back to the very first interplanetary missions, and continues today.

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But why have we seen humanity's journey in space slow down? Why aren't we on Mars? The answer is simple: space is hard. But it is worth the risk because there is new knowledge to be gained for humankind.

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We benefit every day from technology designed for space. Like us, astronauts need clean water to drink. The solution? Silver ionization water purification technology, where silver ions released into the water kill bacteria.

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This simple method, developed for space, has been commercialized and is present everywhere on Earth today, from pools to cleaning towers. Human space flight accelerates innovations that benefit us all.

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Long-term human space flight this requires teammates, old competitors coming together, and even new countries joining the cause. It requires the International Space Station.

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Today, this special laboratory orbits 400 km above us and is dedicated to understanding the effects of space. For over 20 years, astronauts aboard have provided a generation of space research and even more benefits for us here on Earth.

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Iodine filtration is now a critical low-cost solution to providing clean drinking water for developing countries and disaster-stricken regions. Thank space. Water recovery systems able to recycle water from well, us. Thank space.

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But we've also learned a lot about the challenges of spending a lot of time in microgravity. With every month, our bones lose their density, our weight-bearing muscles atrophy, and our most important muscle, our heart, slowly pushes less blood through our bodies.

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And that's not all. Our immune system function, our gut microbiome, and our very genes change. On Earth we also know that our physical health is linked to our mental health.

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Add on to that the fact that key medications degrade faster in microgravity, nasty bacteria like salmonella become more virulent, and we are still learning to grow the most basic crops. Space is hard, but that doesn't mean we quit. We're just not that kind of species.

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We evolved to live on Earth, so there's still much more for us to solve before we can be in space long-term. But think about it: we've been studying physics for hundreds of years and the human body and medicine for thousands of years.

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We are gaining an understanding of how space affects the human body, but this is still a young, fertile area of research. It is important that we continue this journey for our species to survive long-term.

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In 2017, NASA formally announced the Artemis program, the sister mission to Apollo. It aims to see humans go back to the Moon and to see the first female and person of color take their history-making steps.

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But remember, space is hard. Varying levels of gravity, extreme radiation, toxic lunar dust— just like the ISS, this is not a mission NASA can do alone. When space is hard, you need friends.

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Enter Australia, with a legacy of supporting NASA and a research and industry primed to play a role in the Artemis program. The CSIRO, Australia's leading science organization, they helped bring Wi-Fi to the world. Today, they're also driving biotech and health research innovations.

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Australia's mining industries, they hold key knowledge when it comes to remote robotics and accessing hard-to-reach resources. There's so much that Australia can do, including even just being down under. That's significant in its own right.

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With the Canberra deep space communication complex and a series of rocket launch sites or spaceports being developed to bring access to space to the Southern Hemisphere, Australia's investment is driving growth in innovation.

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It's supporting the development of the first Australian-built lunar rover, aptly named the "Rover." We also have an intrepid Aussie astronaut, Katherine Bennell-pegg.

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So we're seeing real this Australian leadership. It's amazing because, whether we like it or not, space is hard, but humanity is going back, and Australia is playing a role.

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With expertise in radiation biology— just ask any Aussie about sun protection— as well as knowledge and innovation across health and agriculture, is going to provide critical solutions for things like growing food that tastes good but, also dealing with the harsh environment of space.

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Australian researchers and engineers are building the critical foundations for this return. Just like Apollo, this is a generational achievement. And while the Artemis generation is still in school, Australians are hard at work.

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That's because human space flight requires a highly skilled global workforce. Australia has the talent. Students get it; they care about our planet and the people on it. They care about the people that will venture off of it into the unknown.

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We must empower this workforce. We must involve them, enable them to explore the key questions and research areas that they feel are important, design their own experiments for space, and provide them the support with science and engineering.

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Today, students are culturing yogurt in space to improve astronauts' gut health. They're experimenting with gene expression and fungi to explore the nutritional benefits. They're also the first Australians to grow plants in space.

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Next, they intend to show us how to capture water from the Moon, providing even more benefits for us on Earth. Space is hard, and it's a good thing that Australia is so innovative because the next chapter of human space exploration requires this input.

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But the next chapter also requires the next generation. The more opportunities we give Australia's bright young minds, the closer we get to making space a little easier. Thank you.