How do astronauts keep fit in space?

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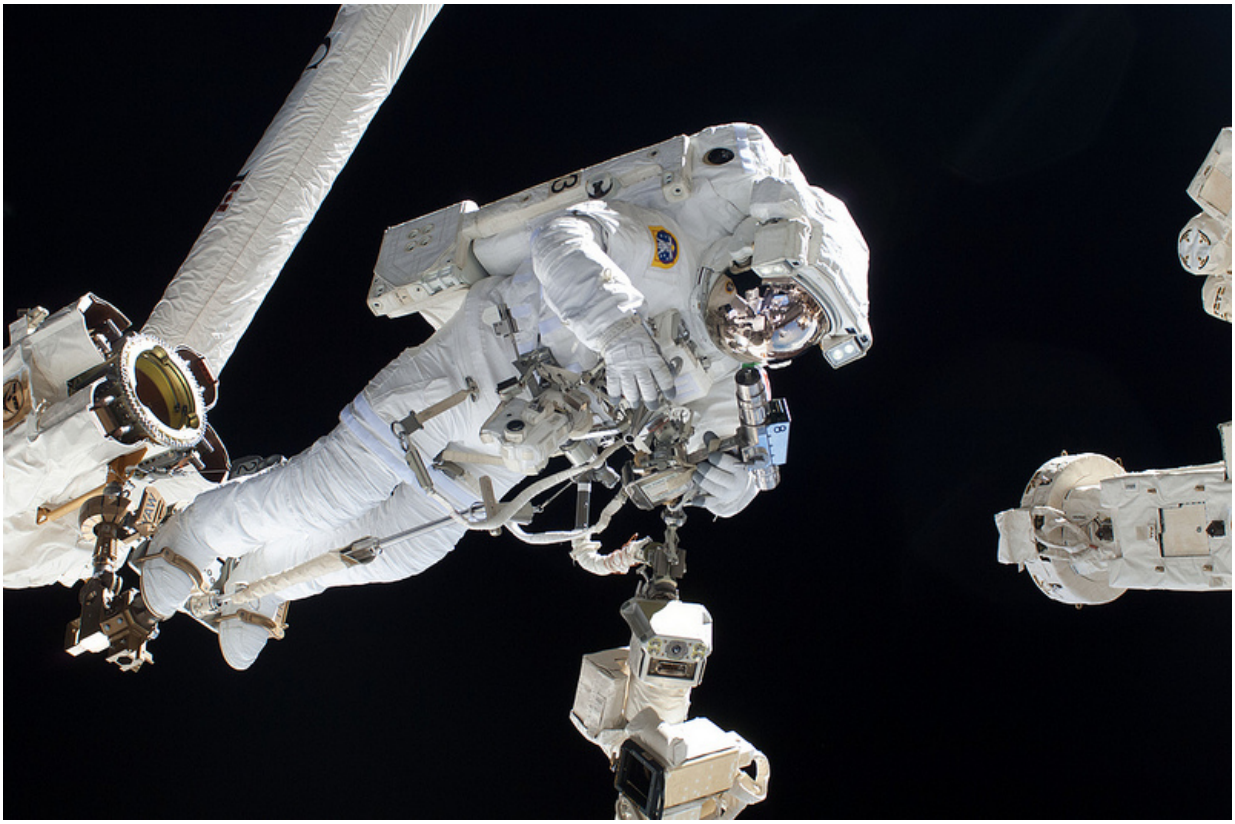

Astronauts are also in danger of being exposed to radiation in space from a variety of sources including solar storms by astronauts can protect themselves by donning water suits. Credit: NASA Johnson

Imagine being the first human to walk on Mars—for today's youngsters such ambitions could really materialise as humankind steps closer to the next cosmic frontier.

But before humans even get to Mars astronauts must first face the journey to the Red Planet.

Human beings were designed by nature to walk on the surface of a planet and space travel is accompanied by prolonged weightlessness, radiation exposure, and the stress of long journeys in confined spaces which creates a number of health issues for astronauts.

But Dr Graham Mann of Murdoch University's School of Engineering and Information Technology and the Mars Society Australia says these problems could be overcome.

Prolonged weightlessness leads to calcium loss from bones and atrophy of muscle tone and strength, but major research efforts are underway to tackle these problems.

Earthbound exercise machines use gravity, like lifting weights or running, to build strength and fitness but in space where you're weightless these machines require a rethink in order to be effective.

Weights in space gyms are replaced by adjustable springs or hydraulic devices that provide the same kind of resistance.

"An example of a very simple exercise kit would be a strip of that very thin, strong rubber that you can buy in sports shops—you just wrap it around feet or grab it with your hands and work away," Dr Mann says.

An astronaut using a weigh machine on the International Space Station.

But you can't exercise all the time, so Dr Mann suggests using special elastic clothing, invented by the Russians a few years ago, to continue bone and muscle toning while the astronaut goes about their daily routine.

"By arranging uniforms with special elastic straps connecting, say, your

legs with your upper torso, it is possible to apply a constant artificial tension across the body," Dr Mann says.

Astronauts are also in danger of being exposed to radiation in space from a variety of sources, including solar storms but they can protect themselves by donning their space suits.

If exposed to radiation an astronaut's bone marrow would be damaged thereby reducing the body's supply of white blood cells and platelets.

But there are already drugs to encourage the bone marrow to increase its supply of these vital elements.

The psychological problems of living in space are a bit overstated, Dr Mann says.

"The astronauts would be kept busy, would have plenty of support, and would not be alone, plus they'd be excited about what awaited them on landing," he says.

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