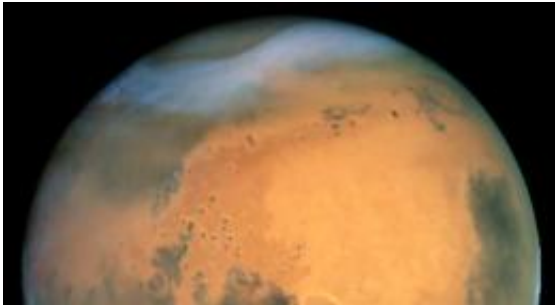


Professors urge one-way Martian colonization missions

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Mars, as seen by the Hubble Space Telescope. Image credit: NASA

For the chance to watch the sun rise over Olympus Mons, or maybe take a stroll across the vast plains of the Vastitas Borealis, would you sign on for a one-way flight to Mars?

It's a question that gives pause to even Dirk Schulze-Makuch, a Washington State University associate professor, who, with colleague Paul Davies, a physicist and [cosmologist](#) from Arizona State University, argues for precisely such a one-way manned mission to Mars in an article published this month in the "Journal of Cosmology."

In the article, "To Boldly Go: A One-Way Human Mission to Mars," the authors write that while technically feasible, a manned mission to Mars and back is unlikely to lift off anytime soon – largely because it is a hugely expensive proposition, both in terms of financial resources and

political will. And because the greatest portion of the expense is tied up in safely returning the crew and spacecraft to earth, they reason that a manned one-way mission would not only cut the costs by several fold, but also mark the beginning of long-term human colonization of the planet.

Mars is by far the most promising for sustained colonization and development, the authors conclude, because it is similar in many respects to Earth and, crucially, possesses a moderate surface gravity, an atmosphere, abundant water and carbon dioxide, together with a range of essential minerals. It is the Earth's second closest planetary neighbor (after Venus) and a trip to Mars takes about six months using the most favorable launch option and current chemical rocket technology.

"We envision that Mars exploration would begin and proceed for a long time on the basis of outbound journeys only," said Schulze-Makuch. "One approach could be to send four astronauts initially, two on each of two space craft, each with a lander and sufficient supplies, to stake a single outpost on Mars. A one-way human mission to Mars would be the first step in establishing a permanent human presence on the planet."

While acknowledging that the mission would necessarily be crewed by volunteers, Schulze-Makuch and Davies stress that they aren't suggesting that astronauts simply be abandoned on the Red Planet for the sake of science. Unlike the Apollo moon missions, they propose a series of missions over time, sufficient to support long-term colonization.

"It would really be little different from the first white settlers of the North American continent, who left Europe with little expectation of return," Davies said of the proposed one-way Martian mission.

"Explorers such as Columbus, Frobisher, Scott and Amundsen, while not embarking on their voyages with the intention of staying at their destination, nevertheless took huge personal risks to explore new lands,

in the knowledge that there was a significant likelihood that they would perish in the attempt."

The authors propose the astronauts would be re-supplied on a periodic basis from Earth with basic necessities, but otherwise would be expected to become increasingly proficient at harvesting and utilizing resources available on Mars. Eventually they envision that outpost would reach self-sufficiency, and then it could serve as a hub for a greatly expanded colonization program.

The proposed project would begin with the selection of an appropriate site for the colony, preferentially associated with a cave or some other natural shelter, as well as other nearby resources, such as water, minerals and nutrients.

"Mars has natural and quite large lava caves, and some of them are located at a low elevation in close proximity to the former northern ocean, which means that they could harbor ice deposits inside similar to many ice-containing caves on Earth," said Schulze-Makuch. "Ice caves would go a long way to solving the needs of a settlement for water and oxygen. Mars has no ozone shield and no magnetospheric shielding, and ice caves would also provide shelter from ionizing and ultraviolet radiation."

The article suggests that, in addition to offering humanity a "lifeboat" in the event of a mega-catastrophe on Earth, a Mars colony would provide a platform for further scientific research. Astrobiologists agree that there is a fair probability that Mars hosts, or once hosted, microbial life, perhaps deep beneath the surface and Davies and Schulze-Makuch suggest a scientific facility on Mars might therefore be a unique opportunity to study an alien life form and a second evolutionary record.

"Mars also conceals a wealth of geological and astronomical data that is

almost impossible to access from Earth using robotic probes," the authors write. "A permanent human presence on Mars would open the way to comparative planetology on a scale unimagined by any former generation... A Mars base would offer a springboard for human/robotic exploration of the outer solar system and the asteroid belt. And establishing a permanent multicultural and multinational human presence on another world would have major beneficial political and social implications for Earth, and serve as a strong unifying and uplifting theme for all humanity."

Although they believe the strategy of colonizing Mars with one-way missions brings the goal of colonizing another planet technologically and financially within our reach, Schulze-Makuch and Davies acknowledge that such a project would require not only major international cooperation, but a return to the exploration spirit and risk-taking ethos of the great period of the Earth's exploration.

They write that when they raise the idea of a one-way [Mars](#) colonization mission among their scientific colleagues, a number express an interest in making the trip.

"Informal surveys conducted after lectures and conference presentations on our proposal, have repeatedly shown that many people are willing to volunteer for a one-way mission, both for reasons of scientific curiosity and in a spirit of adventure and human destiny," they write.

And yes, Schulze-Makuch offered that he too would be prepared to "boldly go" on a one-way mission to the Red Planet. But he hedges just a bit, holding out the single caveat that he would want the launch to wait until his young children have all grown into adults.

More information: The complete article from the 2010 Volume 12 issue of the *Journal of Cosmology* is available online at

journalofcosmology.com/Mars108.html

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