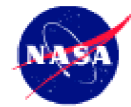





# Roses for the Red Planet



Marshall Space  
Flight Center

**What makes the Red Planet red? Right now the answer is iron oxide, but one day it could be roses say NASA scientists debating the prospects for plant life on Mars.**

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**May 8, 2001** -- It's been nearly 25 years since NASA sent biological experiments to Mars. Chris McKay, a planetary scientist at NASA's Ames Research Center and a member of the NASA Astrobiology Institute, thinks it's time to try again.

McKay helped organize a NASA [conference](#) last year on terraforming -- that is, what it might take to make Mars fit for human habitation.

In a presentation at the conference, McKay proposed an intriguing experiment.



"I'd like to see NASA send a seed to Mars and try to grow it into a plant." It would be important, he stressed, to "use the sunlight, the soil and the nutrients that are available on Mars." McKay suggested that growing a flowering plant on the Red Planet might serve both as a valuable biology experiment and as a powerful symbol of humanity's expansion beyond Earth.

**Above:** This fanciful image by artist [Duane Hilton](#) shows a rose peeking out behind the Mars rock "Yogi." Such interplanetary transplants, if they ever happen, would give new meaning to Mars's nickname, the Red Planet.

"One of the things that I'm very interested in is the notion of Mars as a home for life," he says. "If we think of life as being the main thread of the Mars exploration program, then I advocate that we should get serious about sending life to Mars."



**Left:** Can Mars be made habitable? In this [video](#), astrobiologist Chris McKay proposes an experiment to find out. (Requires [QuickTime](#) player.)

Not everyone at NASA shares McKay's immediate enthusiasm for the project, however.

John Rummel, NASA's [Planetary Protection](#) Officer, is one who has some doubts. Rummel believes that to try "to grow plants on Mars would take power and other resources" that could be put to better use. "We would need to do a lot of analysis of Mars surface material before sending a biological experiment there," he cautioned.

Rummel doesn't disagree that growing a plant on Mars could serve as a powerful symbol. He wonders, though, what the symbolic impact might be if the experiment failed. "If we

want to think of Mars as a place where Earth organisms can grow, we want to know it will work."

Rummel suggests a more pragmatic approach to finding out whether plants could grow in Martian soil: bring the soil back to Earth. "If we're going to challenge Earth organisms with Mars soil," he says, we could do it with returned samples.

Mike Meyer, NASA's Astrobiology Discipline Scientist, agrees with Rummel. He believes that it's important to take a step-by-step approach to understanding the potential for life on Mars. "If we learn enough about the soil on Mars," Meyer argues, "we can simulate Mars here. Then we'd know what we want to test. Otherwise, we'd end up saying, 'Golly, it died, now what?'"

**Right:** At NASA's Jet Propulsion Laboratory, a simulated Mars landscape, called the MarsYard, was developed to test rovers and robotic technology for future Mars exploration. [click on image to [enlarge](#)]



Meyer also makes another point. Until there is a concrete plan to send humans to Mars who will need to grow plants for food, there's no particular hurry to find out whether the plants could grow there. "We would need some reasonable commitment that we'd be sending humans to Mars before we'd do such an experiment," he argued.

McKay has heard these arguments before, but he's not swayed. "There are many logical reasons not to send a plant to Mars on a near-term mission," McKay concedes. But, he counters, "it is a bold and dramatic step that will, in my humble opinion, push the biological agenda for Mars ahead significantly."

"If we're going to send humans to Mars," he adds, "we need to begin studying [that planet's] ability to support human life." And the sooner the better.

NASA does have funding in its budget to investigate some questions relevant to possible future human exploration of Mars. The 2001 Mars Odyssey spacecraft, for example, contains an experiment to measure the amount of damaging radiation that humans traveling to Mars might face.

NASA also plans to send two "Mars Exploration Rovers" to the Red Planet in 2003. Experiments performed by the rovers will help to determine whether resources are available on Mars that will be needed to support humans living there. The European Space Agency will launch a mission in 2003 as well -- a combined orbiter/lander. Current plans are for its lander, Beagle 2, to contain biological experiments designed to search directly for evidence of life on Mars.



Future missions will perform even more experiments to investigate the possibilities and challenges of supporting a human outpost on Mars -- a daunting job made easier, perhaps, by oxygen-giving, food-producing plants. NASA's Mars-exploration roadmap contains no

plan to actually send astronauts there for the next 20 years. But one day humans explorers surely will venture to the Red Planet, and they might want to take a few leafy green companions with them.

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#### **Web Links**

[Mars Exploration Program](#) -- JPL homepage for Mars exploration, with information about past, current, and future robotic missions to the Red Planet

[The Terraforming Information Pages](#) -- on-line reference about terraforming

[The physics and biology of making Mars habitable](#) -- Web page for last year's conference on the prospects for terraforming Mars

[Meet the Experts](#) -- a video of Dr. Chris McKay discussing the human exploration of Mars

[Greening of the Red Planet](#) -- Science@NASA article: A hardy microbe from Earth might one day transform the barren ground of Mars into arable soil.

[Leafy Green Astronauts](#) -- Science@NASA article: NASA scientists are learning how to grow plants in space. Such far-out crops will eventually take their place alongside people, microbes and machines in self-contained habitats for astronauts.

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