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## Builders in a Strange Land

By [Mark Beard](#) | [Also](#) by this reporter

02:00 AM Jun. 18, 2004 PT

If you have the heart of a homesteader and can endure a seven-month journey inside a container the size of a minivan, perhaps you will be among the first settlers of one of humanity's next frontiers: Mars.

You may even find a comfy home -- made with locally produced red brick, metal and fiberglass -- waiting for you on the red planet, thanks to scientists and engineers, many of them from [MIT](#), who are looking into the challenges of building homes on Mars.

But Martian settlers will not want to live stuffed inside small, sterile-looking modular outposts for very long periods, said Mark Homnick, co-founder of the recently formed group at MIT, the [Mars Homestead Project](#).

Interplanetary colonists should be able to bring, or reconstruct, much of what they left behind on Earth soon after they land on Mars, said Homnick, a retired engineer who designed wafer-fabrication facilities for Intel.

"We don't just want to drop them down on Mars with only enough supplies to survive," said Homnick. "We want them to be able to have a good life."

A good life, according to the Mars Homestead Project, means having sufficient space for colonists to tend to gardens, seek out peace and quiet in libraries and greenhouses, and tinker with their all-terrain vehicles inside their own garages.

The Mars Homestead Project aims to design such homes and other spaces for daily living with raw materials found on Mars' surface and in the planet's atmosphere.

Robots and humans will construct the buildings, which will have to accommodate dozens, perhaps hundreds, of colonists, and support emerging commerce on the planet, said Homnick.

Like the European settlers who came to America's shores in the 15th century, Martian settlers in the 21st century and beyond may have to build their homes using the materials they find at their destination, primarily for economic reasons.

Moving large amounts of building materials across space in cargo vessels will be costly and potentially risky, said Bruce Mackenzie, also a co-founder of the Mars Homestead Project, and a regular speaker at meetings of organizations such as the [Mars Society](#), which wants to colonize Mars.

It may be possible to make bricks, fiberglass and plastic from materials found on the planet's surface and in its atmosphere, said Mackenzie.

Settlers, for example, could use CO<sub>2</sub> in the Martian atmosphere to help produce the ingredients necessary to make plastic, Mackenzie said.

Maintaining pressure within Martian homes will be paramount. Materials such as brick and stone will have to be lined or sealed with plastic or fiberglass, and sufficiently reinforced with soil or other materials to prevent the buildings from exploding, said Mackenzie.

The homes will have airlocks throughout to shield inhabitants from areas that have lost pressure.

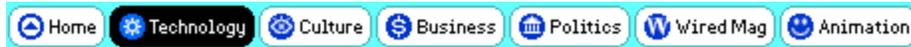
Such homes could be built into hillsides, perhaps. One photograph at the Mars Homestead Project website shows an English home resembling Bilbo Baggins' burrow as described in J.R.R. Tolkien's novel, *The Hobbit*.

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Many people, including space artist [Pat Rawlings](#), have explored the idea of building human habitats inside lava tubes, which are thought to exist beneath the surfaces of Mars and Earth's moon.

Lava tubes could shield colonists from the dangerous radiation levels on the surfaces of Earth's moon and Mars. (Some [proposals](#), such as one made recently by President Bush, call for explorers to establish a colony on the moon before heading to Mars.)

But humans on Earth typically choose to live outside of caves, and near sources of sunlight and water -- something they will also want to do on Mars, said Homnick.

That is why Martian architecture will likely be dominated by domed and rounded structures. Mars' atmospheric pressure is a fraction of that found on Earth. Round or cylindrical shapes will distribute pressure from inside a Martian structure along its surface, said Mackenzie.

In fact, Mackenzie expects the first Mars colonies to be cylinders, much like the habitat at the Mars Society's [Flashline Mars Arctic Research Station](#), or FMARS, on Devon Island in Canada.

"They will look a lot like little sausages," said Mackenzie.

In fact, Kurt Micheels, the architect of FMARS, is working on a new Martian habitat based on his Devon Island creation. Visitors to [ExploreMarsNow.org](#) can tour a sausage-like building designed by Micheels (a landing vehicle modified to have a greenhouse and a carport on either side), which features living, sleeping and eating areas, complete with lighting and some furnishings.

Mars Homestead Project co-founder Mackenzie expects the first Martian settlers to live in habitats similar to that proposed by Micheels, as they help set up the systems needed to create more permanent structures.

The greenhouse and carport will be places settlers may bring their laptops to escape the confines of the landing vehicle, and its other inhabitants, said Micheels.

Still, even inside Mars' permanent brick homes, which will have all of the amenities of their Terran counterparts, the presence of airlocks and a menacing environment outside makes cabin fever seem almost inevitable for many colonists.

"That's why," said Mars Homestead Project co-founder Homnick, "we have added a psychiatrist to the project team, to evaluate those issues."



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