

The Next Mother Lode: Mars

By [Mark Baard](#) | [Also](#) by this reporter
02:00 AM Sep, 06, 2005

Space entrepreneurs eyeing Mars as a hub of some future solar system economy launched a startup on Tuesday to mine the red planet for building materials.

The new company, [4Frontiers](#), plans to mine Mars for building materials and energy sources, and export the planet's mineral wealth to forthcoming space stations on the moon and elsewhere.

The company also wants to build the first permanent human settlement on Mars, using strictly Martian materials, as early as 2025.

The idea is to make Mars a center for needs of the solar system economy, said Bruce Mackenzie, co-founder of 4Frontiers and the company's vice president and outreach director.

"Mars happens to be a good place for these crucial minerals," said Mackenzie. "You have them all in one spot."

"Carbon, nitrogen and hydrogen are all scarce on the moon, but readily available on Mars," said Joseph Palaia, 4Frontiers' other co-founder and vice president of operations and research and development. And while oxygen is available in both locations, "it is easier to extract on Mars," he said.

4Frontiers (the four being the Earth, moon, Mars and the [main asteroid belt](#)) will be ready in 2025 with the tools that space explorers will need to colonize the solar system, said Bruno Marino, a consultant to the company.

"What makes this group so unique is that it is all about getting on the surface of Mars and making the settlement," said Marino. "We are ready to set up shop as soon as we can get on the surface."

Marino was director of science and research at [Biosphere 2](#), an enclosed ecosystem built to model extraterrestrial settlements. The experimental facility, in Arizona, is now on the block.

Biosphere 2 provided much of the inspiration and "lessons learned" for facilities planned for a future Mars settlement, said Marino.

4Frontiers' settlement plan faces some challenges, however, namely the harsh Martian environment, with its nasty chemicals and radiation, said Molly Macauley, a senior

fellow specializing in space policy at [Resources for the Future](#), a Washington, D.C., institute concerned with environmental and energy issues.

Macauley said she would not support any government funding for the startup.

"But if it flies on its own through private financing," said Macauley, "it sounds great."

4Frontiers' business plan is based on research done by the [Mars Foundation](#), a group that has been working on ways to fund and build a Martian settlement with local materials.

In fact, the two groups have close ties. Mackenzie also co-founded the Mars Foundation and was executive director of the Mars Society and a board member of the National Space Society.

It will be many years before 4Frontiers is mining Mars and doling out mineral rights to Martian prospectors. So the company has several moneymaking schemes for the near term.

One plan is to build a full-scale version of the planned Mars settlement and charge visitors to tour the "Mars Settlement Research and Outreach Center." 4Frontiers hopes to have a site selected for the center by the end of this year, said company co-founder and CEO Mark Homnick.

"We've narrowed the search to New Mexico, Central Florida or Colorado," he said.

In addition, the company plans to develop technologies with immediate market value, according its business plan. The group will sell any technology it develops to companies operating on Earth, as well as those participating in NASA's [Earth, Moon, Mars and Beyond](#) space exploration program. (4Frontiers also hopes to consult to these organizations.) The company has already applied to patent a technology for making plastics on Mars using Martian materials.

4Frontiers will also be hiring soon, said Homnick.

"We're not shooting blanks," said Homnick. "We need to staff up. Our message to recent college graduates is, 'You can go with a large corporation, give up some of your freedom and most of your dreams. Or, if you have freedom in your heart, courage to face the unknown and discipline to deliver, contact us.'"