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August 11, 2008

***College's Walter "Vernon" Kramer Serves as Consultant for 4Frontiers Corporation; Discussing Mining Minerals on Mars as Part of Hour-long Program About the History of Iron on Aug. 14***

Remember *Total Recall*, the 1990 Arnold Schwarzenegger movie that took you to a colonized Mars, better known as the Red Planet? What seemed more like science fiction nearly 20 years ago may be closer to reality than you think.

Del Mar College geology instructor Walter "Vernon" Kramer serves as the senior geologist and mining engineering consultant for the Florida-based 4Frontiers Corporation, an emerging space commerce company focused on the settlement of Mars. The company recognizes the economic potential resulting from convergence of four current and upcoming space frontiers—Earth orbit, the Moon, Mars and Asteroids. 4Frontiers' development activities include technologies required for orbital tourism, long-duration human habitation in space and extra-terrestrial resource recovery.

"My job is to locate sources of minerals on Mars and find a method to mine these minerals and deliver them to the 'Mars community' for further processing," Kramer says of his role with 4Frontiers and the company's plans to colonize the Red Planet within the next 50 years as technology evolves. "By using satellite images and Mars landers information, along with my past experience with mining companies, I have come up with methods to extract these valuable minerals close to the proposed community on Mars."

**Kramer will discuss 4Frontiers, his role with the company and their plan to mine minerals, specifically iron, on the Red Planet during The History Channel's MODERN MARVELS hour-long episode on the history of iron.** The daily program celebrates ingenuity, invention and imagination brought to life on a grand scale and tells the fascinating stories of the doers, dreamers and sometime-schemers who have created everyday items, technological breakthroughs and man-made wonders.

**The "History of Iron" will tentatively first air this Thursday night, Aug. 14, at 8 p.m. Central Daylight Time. Repeats of the program are scheduled for Friday, Aug. 15, at midnight and Saturday, Aug. 23, at 3 p.m. (Central Daylight Time). Viewers can catch Kramer in Act 5 of the program, Mining in the Sky. Time Warner Cable broadcasts The History Channel on channel 78 while Grande Communications airs the program on channel 70.**

The online link to check program listings for MODERN MARVELS is available at [www.history.com/minisites/modernmarvels/](http://www.history.com/minisites/modernmarvels/).

Producers flew Kramer to Minnesota to stand in an iron mine pit to film his portion of the

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MODERN MARVELS segment. "The difference between how iron is mined here on Earth and what we can do once we colonize Mars is like night and day," he says.

"Materials such as iron are available on the Mars surface and relatively easy to access at any time," Kramer says. "Mars has an atmosphere and 38 percent of Earth's gravity, so current Earth material recovery methods can be modified to function on Mars. For iron and steel, it's easier to use Earth based processes [on Mars] while on the moon and asteroids, new processes must be developed.

He notes that hematite iron ore in the form of spherules, or blueberries, and iron meteorites that contain nickel, which is useful for stainless steel, cover a large surface area in the Meridiana Planum of Mars where the Mars Rover "Opportunity" is now located. "The spherules, which are about the size of a pencil eraser, can be scooped up along with sand and some rocks with a 'Mars modified' front end load as compared to the drilling, blasting, excavation and ore crushing process used on Earth," Kramer says.

Why is a company like 4Frontiers focused on colonizing Mars, along with the Moon and asteroids?

"Some metals may become scarce on Earth over the next decades," Kramer says. "As an example, experts with Yale University predict a shortage of copper by 2030. 4Frontiers believes it's generally more attractive to send materials from Mars and asteroids to destinations on the moon and in the Earth orbit, assuming there's access to space and that related technological development continues to improve."

To learn more about 4Frontiers and their endeavor to colonize Mars, the Moon and asteroids, go to [www.4frontierscorp.com/](http://www.4frontierscorp.com/).

In the meantime, don't miss Kramer on The History Channel.

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