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I-Team: Nuclear reactor test in Nevada could make a Mars trip reality

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LAS VEGAS

This story may sound like the plot of a science-fiction movie.

Next year, a team of top scientists will hunker down inside a classified facility in the Nevada desert so they can experiment with a piece of advanced technology.

The test will focus on a small nuclear reactor and if it works as planned, it could be a huge step toward putting humans on Mars.

In the hit movie, "The Martian," stranded astronaut Matt Damon has one heck of a time surviving and getting around in the harsh environment of the red planet.

Scientists and engineers think that getting to Mars, and establishing a base, will require a better power system than what was shown in the film.

"Mars is in the air. We grew up with the Apollo program," said Patrick McClure, Los Alamos National Lab. "We really want to make that happen in our lifetime. We think it would be a great contribution to humanity."

Like his other far-flung team members, Los Alamos nuclear reactor scientist Patrick McClure is bubbling with enthusiasm about the end uses for the small nuclear reactor his team will test in the Nevada Desert in 2017. The reactor is named Kilopower.

The experiment is dubbed KRUSTY, and yes, it's an acronym named for the character in "The Simpsons" television show, but the goals are all too serious.

Information about the KRUSTY project

The experiment will take place in the device assembly facility, DAF, a highly secure structure deep inside the Nevada National Security Site. The KRUSTY reactor will produce up to 10 kilowatts of electricity, which may not sound like much on earth but could mean life or death out there.

"So we can use it for deep space or the martian surface, and the idea is to build that reactor for future NASA missions. We have a power source that can range in missions, whether that's to the icy moons of Jupiter and Saturn, or something like Encephalus or Titan, or to actually provide power on Mars, to make fuel, to make oxygen for a return trip," McClure said.

Small nuclear reactors could power the habitats that form a permanent base on Mars and charge up the rovers that could carry earthlings on martian expeditions.

"There's no new physics required," said Mike Houts, NASA Marshall Space Flight Center. "No giant mysteries to solve. It's very doable."

Houts is the nuclear research manager at NASA's Marshall Flight Center, one of two NASA outfits involved in the KRUSTY experiment. In addition to developing nuclear reactors as mobile power sources on the ground, he thinks the same technology could act like a turbo-charger for spacecraft bound for Mars or beyond.

"The idea behind nuclear thermo propulsion is to try and get the astronauts to Mars very quickly. That, of course, reduces their exposure to galactic cosmic radiation, exposure to microgravity, any of the other hazards associated with deep space travel," Houts said.

He adds, the booster engine might need to run only two hours to achieve enough velocity for a quick trip to Mars. The surface power systems could operate for years. The device for KRUSTY, about the size of an oatmeal box, is being built at Oakridge lab. The Nevada members of the team say hosting the experiment in Nevada is a perfect fit.

For one, there's no cost to build a new facility, and two, the Nevada test site is where nuclear rocket engines were successfully tested 50 years ago. The site is where the NERVA project still stands. President Kennedy championed the project and visited the site a year before he died.

JFK toured test site to check on classified project

"It could have happened. You could have nuclear powered rockets taking people to Mars, by now. That would be the reality of this," said Darwin Morgan, Department of Energy.

"Definitely, in the 2030s, we will have the technology and the capability to go to Mars," Houts said.

"This is exciting stuff," McClure said. "We like it."

The exact date for the experiment isn't set, but the I-Team will keep you posted.

Online story link:

http://www.lasvegasnow.com/news/i-team-nuclear-reactor-test-in-nevada-could-make-a-mars-trip-reality