

# Shooting for the moon -- to mine it

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Moon. Photo courtesy of NASA

Most people don't take it literally when they're told to shoot for the moon - but thinking small isn't Naveen Jain's way. The 52-year-old Internet entrepreneur is a co-founder of Moon Express Inc., one of several companies in the Google Lunar X Prize competition, in which privately funded teams will try to put robots on the moon by 2016.

Jain's plans don't end at reaching the moon's surface. MoonEx, as his company is also known, plans to make billions mining the moon for precious resources. It also hopes to let customers send messages and materials to the moon.

Jain spoke with the Los Angeles Times about the project.

Q: Why go to the moon?

A: Our interest in the moon came because we think it's a great business, not because it's a great hobby. My whole thinking really is, how do we use science and entrepreneurship to solve the big problems?

The MoonEx project came about because we started thinking: There are a tremendous amount of resources that are available on the moon, and the moon has never been explored from the perspective of an entrepreneur. Every 6 inches of moon has been mapped. But no one has combined the data together and realized (that) these resources are right here.

Q: What kinds of resources?

A: [Rare earth elements](#). Today, 80 percent of these come from [China](#), which now has a policy not to export them. That means we're held hostage. We know we can get these elements on the moon.

Q: What makes MoonEx different from moon landers of old?

A: Starting out, I knew nothing about the moon. Or space. But that is what allows us to do things that other people have not done.

The space business has always thought, you want to build the biggest possible [lander](#). My thinking was, why not build the smallest possible craft? And instead of building a rover, we're building a hover aircraft. It's going to be about 5 feet by 5 feet, and it will be self-guided.

Q: What will this cost you?

A: The idea is to develop a system and take a lander to the moon for under \$70 million. NASA had to spend billions of dollars to figure out how to do it. Now we're able to use existing technologies.

Q: By passing the torch to companies like yours, is NASA giving up?

A: NASA isn't giving up on the moon or outer space. They're simply passing this on to the private sector and saying, "Look, the science for this has been developed." Now it's up to the private sector to go out and create businesses.

Now there is a chance for the government to go out and push the envelope in space even further. They can go out and develop the technology to go to Mars, develop the technology to go to asteroids. I think the government is doing the right thing.

Q: Who owns the moon?

A: People do say, "What right do you have to go up there and do this?" But it's no different than looking at international waters, which nobody owns. You can go out there and fish, and the fish you bring in is yours. You can drill there, and the oil you bring in is yours. You still don't own the water. How is it going to be different on the moon?

Q: What are the biggest technical challenges you face?

A: There is no technical challenge. It's rocket science, but well-understood rocket science. All we're doing, really, is trying to put together technology in the most optimal way to bring the cost down.

Q: But you do have to figure out how the lander will lower itself to the surface.

A: Yes, we have to develop a last-mile solution - a last-10-feet solution. The problem is how to slow down, fire the propulsion, land in the right place and be able to move around.

Q: In addition to bringing resources back to Earth, you're sending messages and other items to the moon, right?

A: We are asking people, "What does the moon mean to you - and would you pay to send something there?"

It's the best time capsule you could ever find, because nothing gets destroyed there - even the astronauts' footprints are still there. So would you pay \$20 to send a picture of your family? Would you send the DNA of your pet? Would you send your grandfather's ashes?

We're building a platform that will allow people to do all kinds of things on the moon and control those activities over the Web. What people will do with that, you and I could only guess. We all knew people were going to do things on their iPhones. Who would have thought the No. 1 thing people were going to do is throw birds at pigs?

Q: What is your relationship with NASA?

A: We have an agreement with NASA that allows us to use NASA technology and allows us to hire NASA to do work for us. Also, NASA has matched the [Google](#) Lunar prize for \$30 million. We're one of those three companies in the running.

Our hover test facility is at NASA Ames (Research Center) in Mountain View.

Q: When do you think it might take off?

A: Right now, we're shooting for late 2013, two years from now.

Q: Will scientists use the MoonEx rover for research?

A: Absolutely! There will be scientific missions, there will be consumer missions, there will be business missions.

Q: One could imagine a day when there are various craft roving the [moon](#), busily working away. How long in the future is that?

A: My gut is it will be the next five years.

Q: Do you expect MoonEx to be profitable?

A: We wouldn't be doing it if we didn't think it could be a profitable business.

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