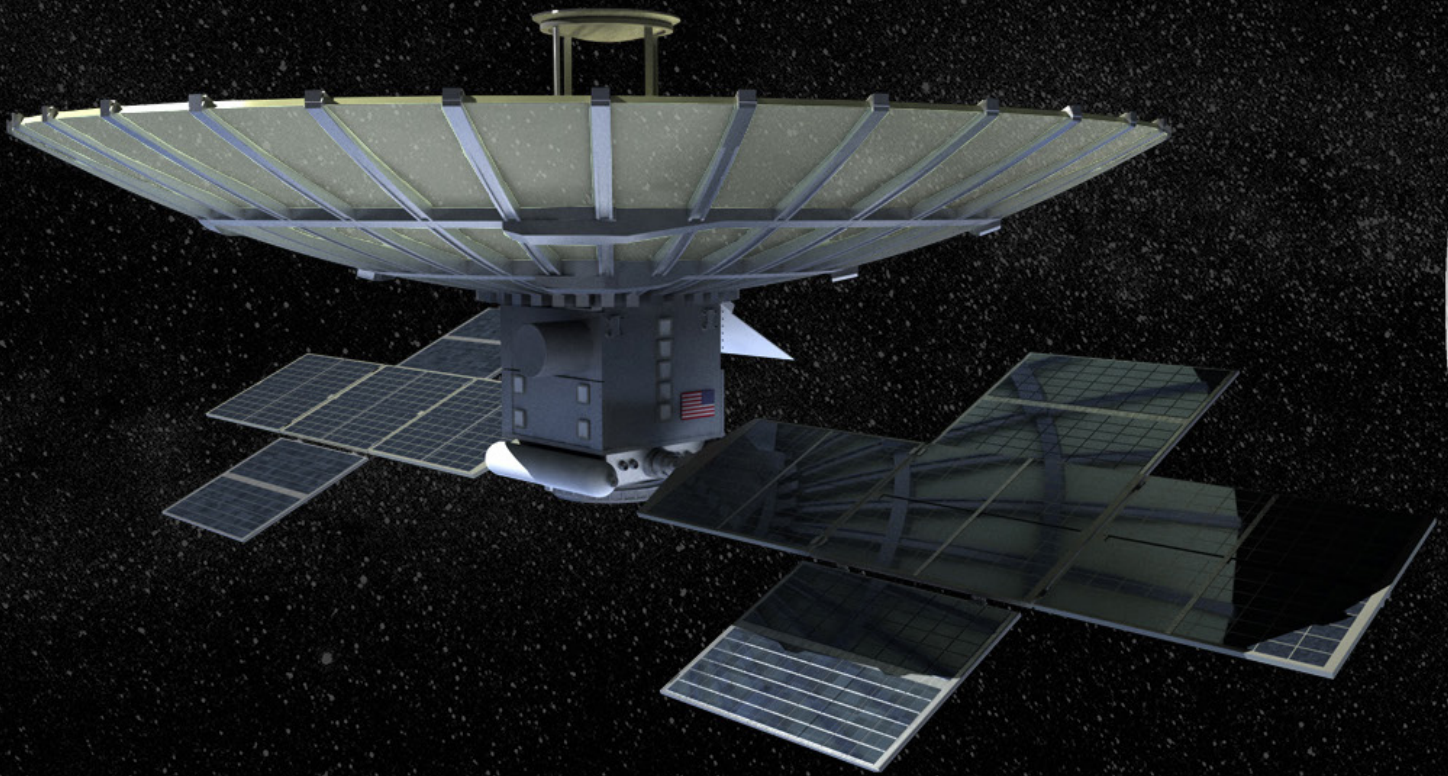


ADVANCING Commercial Space

By Bryan Corliss







A Redmond company is preparing to build a spacecraft that will travel faster than any other machine has flown.

The company's plans for growth here on Earth are almost that rapid as well.

"In terms of the stars aligning, we've got a lot of things serendipitously coming together," said Lisa Rich, Founder and COO of Xplore.

This summer, Xplore signed a lease and moved into the Redmond, Washington business park campus, a 22,000-square-foot building where Rich says they will assemble, integrate and test space vehicles.

The building was formerly home to a now-defunct space company and it had everything Xplore needs to do the work. She said. "There are clean rooms that are fully vented — mechanical rooms, electrical fabrication and optical rooms — it's enormous, and immaculate."

If Xplore outgrows our big building there are adjacent buildings, so we could potentially expand our campus and take over this entire space someday.”

Xplore is working on two very different space vehicles as it pursues a goal to make space a service industry.

The first is Xplore’s Xcraft, which will be the first spacecraft to be built at the Redmond site.

Just keep truckin’ on

The Xcraft is a small ESPA-class satellite. (If you’re not familiar, ESPA stands for External Secondary Payload Adaptor.

In lay terms, the Xcraft is like a delivery truck for satellites, Rich says.

The Xcraft is a next-generation spacecraft designed to carry large volume of instruments. It can carry high-capability instruments such as a large synthetic aperture radar (SAR), or carry cubesats, satellites as small as 10 cm x 10 cm x 10 cm (1U) that can be stacked to create satellites comparable in size to gallon or half-gallon milk cartons. Cubesats are cheap – a basic one can be outfitted for \$50,000 or less – which makes them popular with universities: students at the University of Washington in 2019 built, launched and controlled a satellite they dubbed HuskySat-1.

The problem for those small businesses and universities isn’t building the cubesats, Rich said. The problem is getting them to orbit. “Their goal is not to design the truck – it’s getting a tech demo and gaining flight heritage.”

So Xplore will offer these smaller customers a service.



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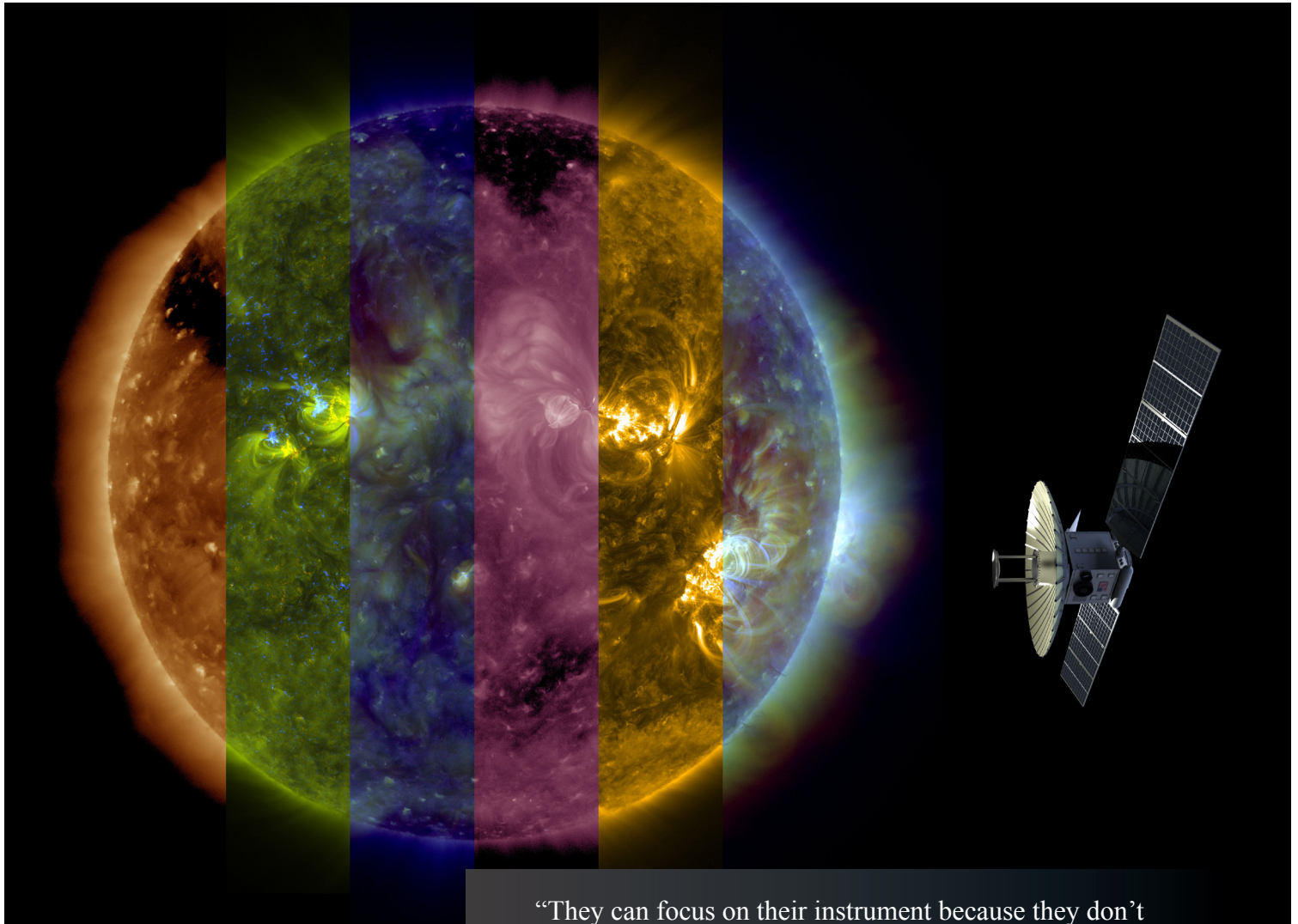


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“They can focus on their instrument because they don’t have to build a truck, integrate their payload, or design the mission and launch,” Rich said. “We’re powering their instruments and bringing their data back.”

Their cubesats can fly inside and be deployed from an Xcraft, which is about the size of a small refrigerator that fits snugly on a SpaceX Falcon 9 or similar rocket. It will be capable of carrying multiple cubesats and other instruments, up to 70 kg of payload or 50U. Beyond this, its ESPA-class design allows the company to serve higher-capability customers who require them to power, navigate and task instruments for communication relay or remote sensing applications.

The cost for the customer is low – instead of paying for the whole launch, they’re just paying for their fractional share of the payload.

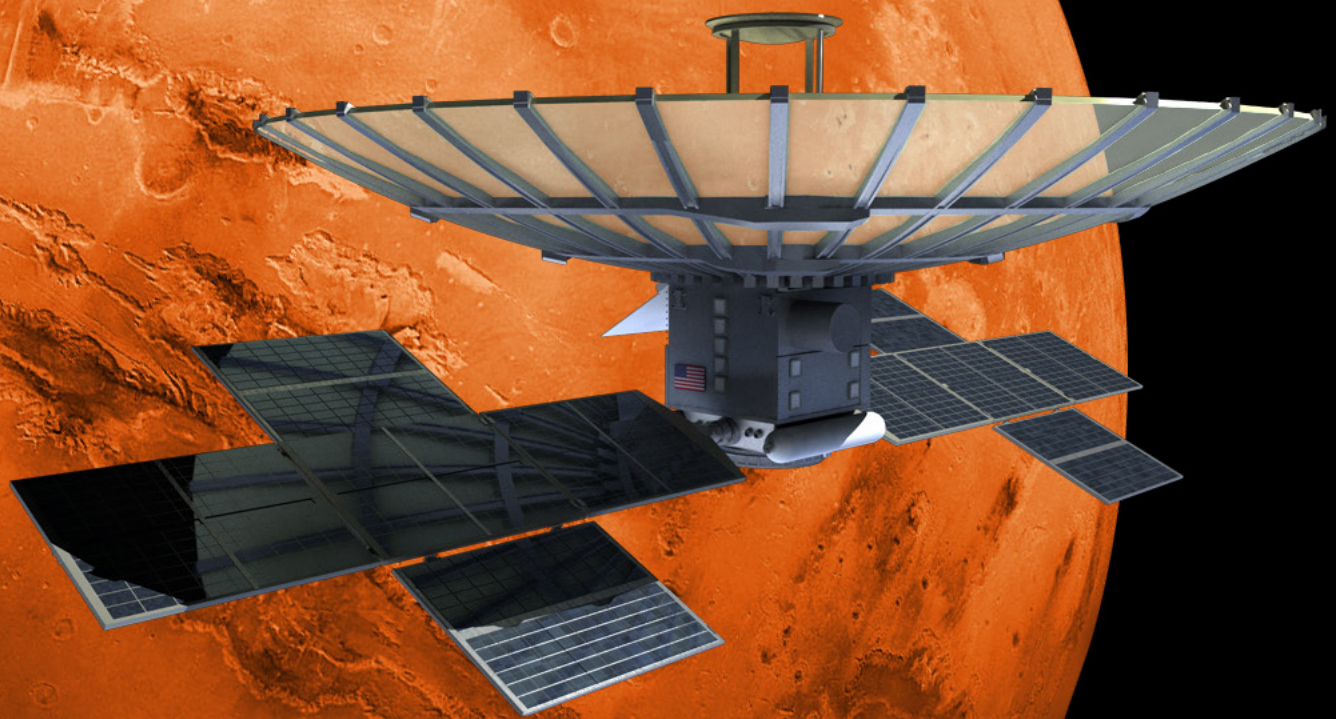
It’s a growing business. Xplore has won contracts with agencies like NASA, the National Oceanographic and Atmospheric Administration (NOAA) and the U.S. Air Force. Now it wants to capture more.

“Space companies are building more instruments, and they want to test more things,” she said. “There’s a lot of work to be done.”

Come sail away

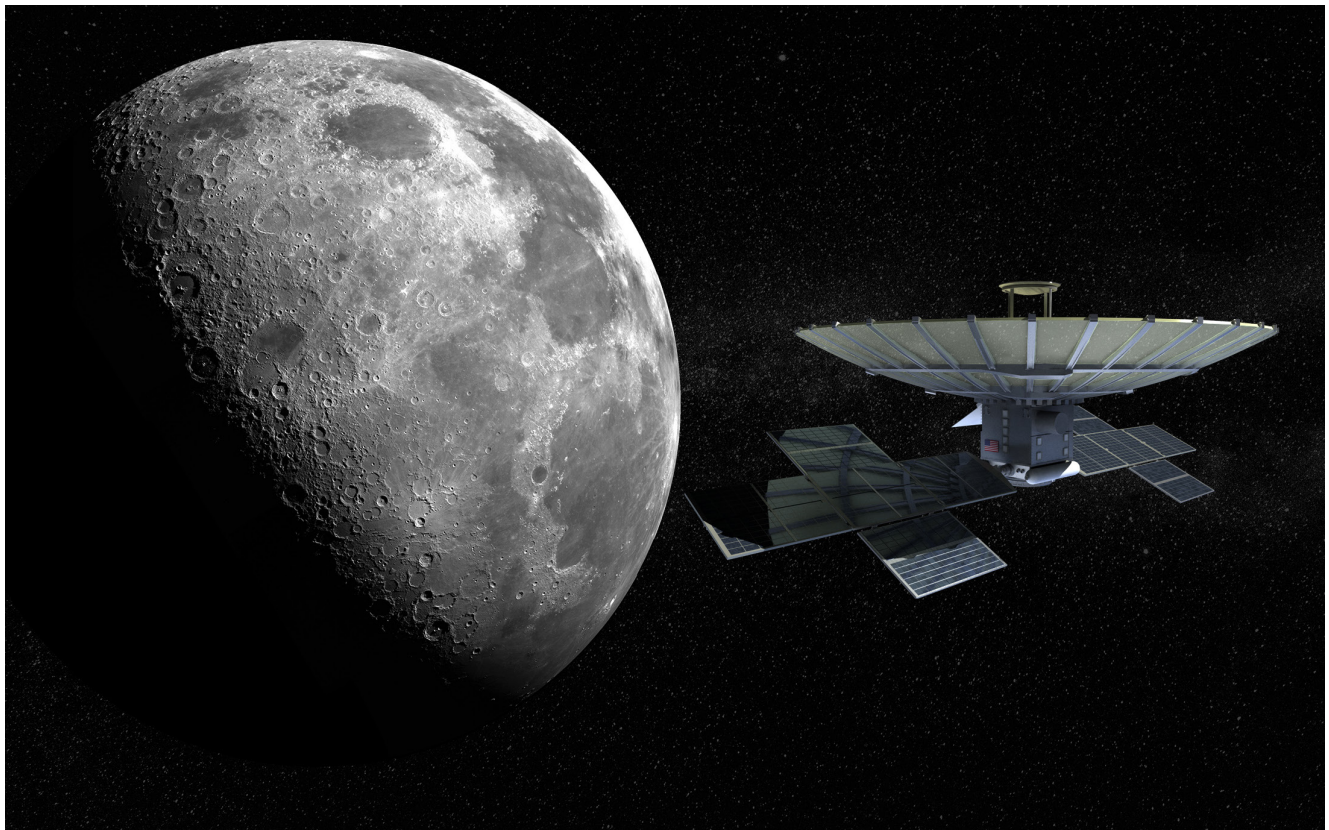
Science fiction fans grew up reading about light sails: spacecraft towed behind thin sheets of material that capture photons emitted by a star.

Truth has caught up with fiction. In 2010, the Japanese Aerospace Exploration Agency (JAXA) launched the first demonstration satellite powered by a light sail, called IKAROS.



It successfully transited the distance to Venus in about six months, and JAXA ground controllers were able to wake it up from hibernation and download its data four times over the next five years.

Then in 2019, the non-profit Planetary Society successfully launched LightSail2, which is towing a three-unit cubesat in Earth orbit. It is expected to fall out of orbit sometime this fall or winter, and burn up in the atmosphere.



Today, Xplore has teamed with NASA, the Jet Propulsion Laboratory and The Aerospace Corporation to build a next-generation light sail. Xplore calls it the LightCraft.

Instead of having just one sail capturing photons flying out from the Sun, the LightCraft will have six that can be adjusted to best capture the energy. “It’s very much like the masted sailing ships that the ancient mariners used,” Rich said.

As planned, LightCraft missions will start with a satellite launch into Earth orbit. The sails will deploy, and then the LightCraft will head toward the Sun, coming inside the orbit of Mercury before swinging around to fully capture the massive pressure from the solar radiation at its source.

From there, it will head out into the Solar System at a speed fast enough to get to Jupiter within a year.

Xplore already is building prototypes for the LightCraft, which is part of the reason it needed the big space in Redmond.

The bluest skies you’ve ever seen

Rich and her co-founders began Xplore four years ago. They located the company in suburban Seattle to take advantage of its rapidly developing Space 2.0 cluster.

Puget Sound has advantages for space companies that no other region has, Rich said. “It’s a hub of the space industry and the talent is here.”

First, of course, is the fact that we’ve been building flying things for more than a century. “The history of our area, starting with aerospace at Boeing, you’ve got engineers who’ve worked on aerospace and space. You’ve got that technology and understanding of how to work with these materials that will be used in space.”

Along with that is the obvious fact there’s a leading global tech hub in Puget Sound. Successful flights in space require a lot of computing power on the ground, Rich said. “Space is ultimately about the data you bring back,” she said. “You’re going to have to cache it, store it.”

Xplore and other space companies can tap into data center operations run by Microsoft and Amazon, each of which have thousands of software engineers dedicated to their cloud computing services.

In addition, Rich said, Amazon founder Jeff Bezos has had a strong impact by founding Blue Origin, which is based in Kent, Washington.

Bezos is putting about a billion dollars a year into the company, which is quietly being spent in ways that will benefit the whole industry. Rich said,

“It’s great to see they are ushering in a new era for human space travel with the New Shepard crew capsule, launching July 20th.

And speaking of investments, now is a great time to be seeking capital, Rich said, with scores of institutional investors, special purpose acquisition companies and big-money private investors all putting money into space ventures.

“The space environment right now could not be in a firmer footing,” Rich said. “We’re pretty thrilled about that. There’s never been a better time in history for funding great companies.”

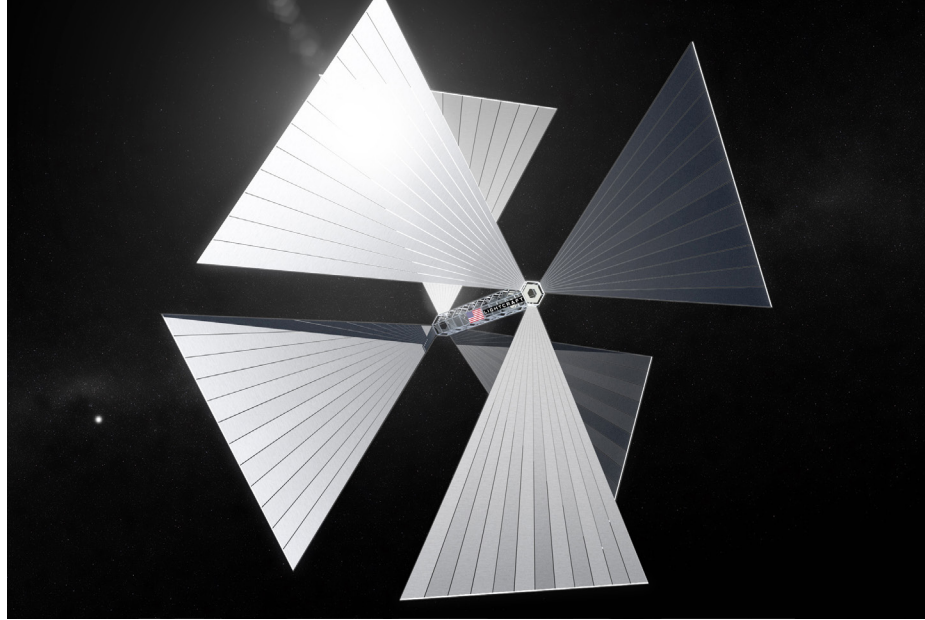
Rich should know: Before founding Xplore, she founded Hemisphere Ventures, a venture capital fund that has invested in 30 different space companies, including Axiom Space, which is taking private citizens to the space ISS on the SpaceX crew capsule later this year.

People who need people

The one big challenge Xplore faces, Rich said, is finding the right human capital to invest in.

“Our number one goal is attracting the talent that we need to be ramping up our team,” she said.

While the talent is here in the Northwest, those talented people already are employed. Rich said, “If they aren’t looking for a job they might not know about the incredible opportunities we offer to make space history.”



To address that, Xplore is making an aggressive pitch to potential key hires: We’re a small company doing big things; come join us.

“We’re attracting a team where our employees aren’t cogs in the wheel,” she said.

“We’re a more-mature early-stage company. We are founders who know what we’re doing and are providing a chance to work with an exceptional team. We have a 20-year history of running and operating successful businesses, so we are here for the long-term, and are the ones to watch.”

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