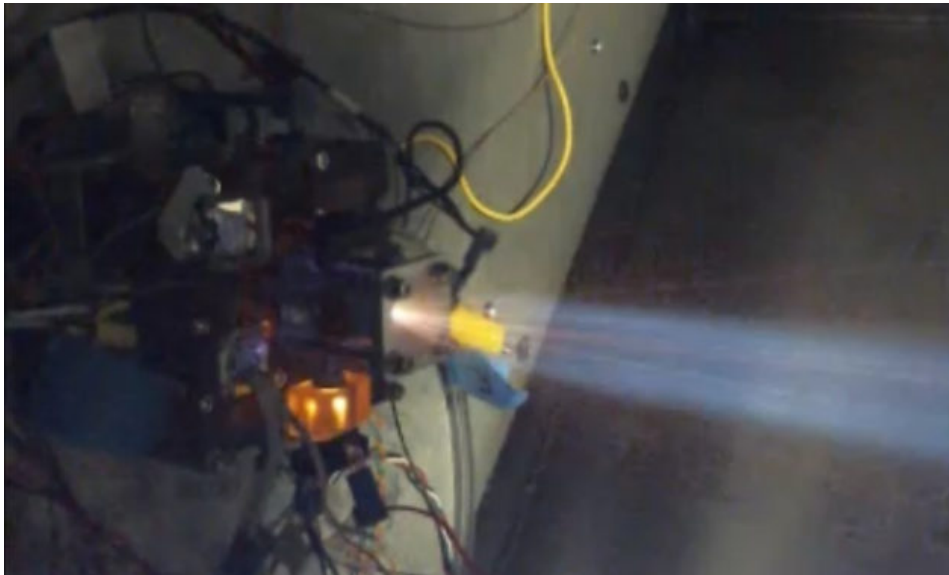


**Trending:** Gates Foundation pledges \$1.6B for vaccines; Bill Gates addresses 'bizarre' conspiracy theories (<https://www.geekwire.com/2020/gates-foundation-pledges-1-6b-vaccines-bill-gates-addresses-bizarre-conspiracy-theories/>)

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## Tethers Unlimited wins \$2.2 million in contracts for satellite mini-thruster system

BY ALAN BOYLE ([HTTPS://WWW.GEEKWIRE.COM/AUTHOR/ALANBOYLE/](https://www.geekwire.com/author/alanboyle/)) on August 2, 2016 at 10:53 am



(<https://cdn.geekwire.com/wp-content/uploads/2016/08/160802-hydros-tethers-unlimited.jpg>)

Tethers Unlimited Inc.'s Hydros thruster fires during a test. (Credit: TUI)

Tethers Unlimited Inc. (<http://www.tethers.com/>) says it's won \$2.2 million in contracts from NASA and Millennium Space Systems (<http://www.millennium-space.com/index.html>) to provide its miniaturized, water-fueled Hydros thrusters for satellite missions.

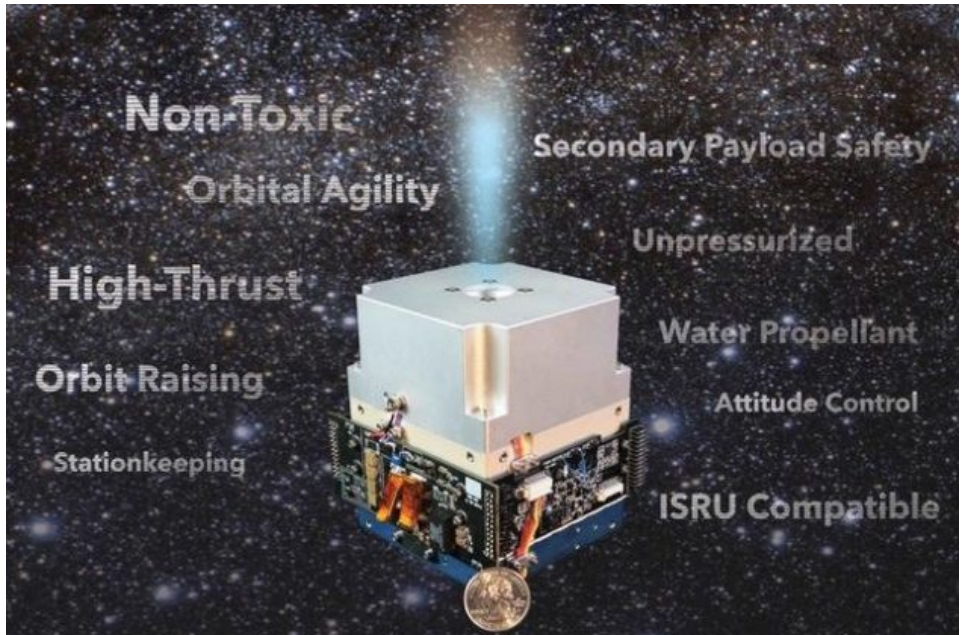
The company, based in Bothell, Wash., is developing the Hydros as a safe-to-launch propulsion system for CubeSats and other small satellites. The thrusters measure about 4 inches wide. They run on hydrogen and oxygen, which can be produced in space by splitting water molecules (H<sub>2</sub>O) using solar-powered electrolysis ([https://en.wikipedia.org/wiki/Electrolysis\\_of\\_water](https://en.wikipedia.org/wiki/Electrolysis_of_water)).

Hydrogen and oxygen gases are burned in the thrusters to propel satellites during maneuvers. The propulsion method is similar to the principle that's been used for the space shuttle main engines (<http://www.rocket.com/space-shuttle-main-engine>) and Blue Origin's BE-3 rocket engine (<https://www.blueorigin.com/interviews/2016/09/20/behind-the-scenes-at-blue-origin/>)

hydrogen-rocket-engine), but on a much smaller scale.

Tethers Unlimited says the water-electrolysis method makes it possible for tiny satellites to carry a fuel source that’s non-explosive, non-toxic and unpressurized.

“Traditionally, it has been very difficult to launch small satellites with propulsion capabilities, due to the risks that standard propellants such as hydrazine pose to the launch vehicle’s primary payload,” Rob Hoyt, Tethers Unlimited’s CEO and chief scientist, explained in a news release. “Hydros will enable highly maneuverable satellites to launch as secondary payloads without posing a significant risk to primary payloads.”



(<https://cdn.geekwire.com/wp-content/uploads/2016/08/160802-hydros-thruster-graphic.jpg>)

A graphic shows the Hydros thruster, with a penny included for size comparison. (Credit: TUI)

Tethers Unlimited said today that the contracts include a public-private partnership with NASA to deliver a Hydros propulsion system for a CubeSat mission, and an associated contract to provide three Hydros thrusters for Millennium Space Systems’ Altair-class microsattellites. Altair satellites can be used for a wide range of military and commercial applications.

“We are scheduled to deliver flight units to MSS in March of 2017,” Hoyt told GeekWire in an email. “My understanding is that the launch of MSS’s Altair satellites is July 2017, so it’s a very fast-paced program.”

Hoyt expects the mini-thrusters to extend the capability of nanosatellites, which are becoming increasingly popular in the space industry.

"In the future, when asteroid and lunar mining efforts (<https://www.geekwire.com/2015/asteroid-riches-president-obama-signs-space-resource-bill-into-law/>) begin to provide in-situ resources, the Hydros technology will enable use of the water ice available on asteroids and the moon to propel the spacecraft, equipment and resources needed for a robust in-space economy," he said.

Tethers Unlimited was founded in 1994 by Hoyt and science-fiction author Robert L. Forward to develop innovative technologies for space and defense missions. Last month, the company announced that its Firmamentum division received \$750,000 in NASA funding to build a combination 3-D printer and plastic recycler (<https://www.geekwire.com/2016/nasa-firmamentum-3-d-printer-recycler-space/>) for the International Space Station.

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## Amazon helps to close the learning gap for students (<https://blog.aboutamazon.com/community/amazon-donates-8-200-laptops-to-seattle-public-schools-families>)



(<https://blog.aboutamazon.com/community/amazon-donates-8-200-laptops-to-seattle-public-schools-families>)

### GeekWire's coverage this month is underwritten by Amazon

Amazon **is donating 8,200 laptops to Seattle Public Schools (SPS)** (<https://blog.aboutamazon.com/community/amazon-donates-8-200-laptops-to-seattle-public-schools-families>) families to help all students within the state's largest school district gain access to a device so they can continue their education at home. The donation will help close the continuous learning gap for all students during the COVID-19 pandemic.

**Read more about how Amazon is responding to COVID-19 here.** (<https://blog.aboutamazon.com/company-news/amazons-actions-to-help-employees-communities-and-customers-affected-by-covid-19>)

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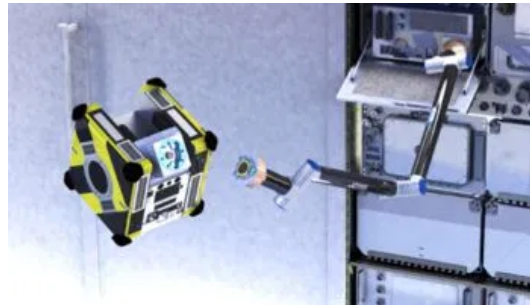


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