Rocket Report: Russia talking big boosters, fly *us* to the Moon

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Welcome to Edition 2.28 of the Rocket Report! As we get deeper into 2020, we could see as many as a half-dozen new orbital rockets debut this year, with a mixture from the United States, China, Europe, and India. It will be fun to track how many of them—big and small—actually make it to the launch pad. And how many of them are successful, of course!

As always, we welcome reader submissions, and if you don't want to miss an issue, please subscribe using the box below (the form will not appear on AMP-enabled versions of the site). Each report will include information on small-, medium-, and heavy-lift rockets as well as a quick look ahead at the next three launches on the calendar.

Vega rocket loses a launch contract. Arianespace will launch the United Arab Emirates' Falcon Eye 2 reconnaissance satellite on a Soyuz in March instead of waiting for the company's much smaller Vega rocket to return to flight, the

company told SpaceNews. Vega has been grounded since a July failure that destroyed the UAE's Falcon Eye 1 satellite, resulting in a record $415 million insurance claim.

Not due to concerns about Vega? … Stéphane Israël, CEO of Arianespace, said Airbus, the satellite's manufacturer, asked to switch from Vega to Soyuz to avoid further delays getting Falcon Eye 2 into orbit. "The customer has decided to go to this backup solution, and it's definitely linked to the capability that was offered by Soyuz to be launched earlier than Vega." Airbus spokesperson Jeremy Close confirmed the switch January 10, saying the transfer to Soyuz was about schedule, not a distrust of Vega. If y'all say so.

SpinLaunch announces $35 million more in investments. The Long Beach, California-based company said Thursday it has received an additional investment for continued development of the world's first kinetic launch system, designed to provide the lowest-cost, environmentally responsible orbital launch system to serve the rapidly growing small-satellite industry.

Accelerating the mass accelerator … Investors include Airbus Ventures, GV, KPCB, Catapult Ventures, Lauder Partners, John Doerr, and Byers Family. The funds from this investment will be used to scale the SpinLaunch team and technology, which uses a large mass accelerator to launch small satellites in virtually any weather conditions. "Later this year, we aim to change the history of space launch with the completion of our first flight-test mass accelerator at Spaceport America," Jonathan Yaney, SpinLaunch's founder, said in a news release.

The Rocket Report: An Ars newsletter

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New Shepard will launch student experiments. The American Institute of Aeronautics and Astronautics and Blue Origin are

inviting high school students to develop creative research proposals in the fields of microgravity science or space technology. The top proposal will be launched on Blue Origin's New Shepard rocket and receive a $1,000 grant to prepare and develop the experiment for flight, AIAA announced.

Inspiring the next generation … "There's no better way to learn than by doing," said Dan Dumbacher, AIAA executive director. "These students have an amazing opportunity to contribute to space research while learning how transformative aerospace can be while gaining the skills that will serve them well throughout their careers!" Just like NASA's microgravity program that gave high school students rides on its "Vomit Comet," this is a nice initiative. (submitted by Ken the Bin)

2020 could be a big year for rocket debuts. Based upon previously announced schedules, a number of small and large rockets could take their first flights in 2020, Ars reports. On the small side, Virgin Orbit's LauncherOne, Firefly's Alpha, and possibly a rocket from Astra Space could all fly this year. Internationally, too, expect lots of action. Ariane Group's Vega C rocket, India's Small Satellite Launch Vehicle, and a few players in China may all take flight.

Some bigger ones, too … First up is Starship, and we may see a suborbital (or even orbital) test of SpaceX's second-stage vehicle later this year. The company has now begun work on the third iteration of its Starship prototype (SN1) in South Texas, and this may be the Starship that ultimately launches from near Boca Chica Beach. If you're looking for a more conventionally designed big rocket, AVIO continues to say it is on track for a 2020 debut of its Ariane 6 booster from its European spaceport in French Guiana.

Orbex signs its first US customer. Launch integrator TriSept Corp. announced plans this week to purchase an Orbex Prime launch vehicle for a dedicated rideshare mission to fly from Scotland's Sutherland Spaceport in 2022. The US-based launch

vehicle integrator and mission manager is seeking to bolster its international presence.

Launching next year? … "We've been engaging with the international community to increase the number of spacecraft providers available to help fill these missions," Jason Armstrong, TriSept Launch Integration Services director, told SpaceNews. "Rideshare is becoming a prevalent portion of almost every launch." Orbex plans to conduct its first orbital launch in late 2021, followed by three or four missions in 2022, before picking up the pace in 2023. We'll be suitably impressed if the company holds to that schedule. (submitted by Ken the Bin)

Smallsat-launch startup will test at Edwards. The Air Force Research Laboratory announced January 9 that it signed an agreement with small-launch startup ABL Space Systems to jointly develop and test rocket-propulsion components for future use in launch vehicles, SpaceNews reports. The company says its RS1 rocket will lift 1,200 kilograms into low Earth orbit at a price of $12 million per launch.

What's that in Area 56? … The company is intriguing, as it was founded by several former SpaceX employees and is based out of El Segundo, California, where SpaceX had its first small factory. Lockheed Martin is an investor in the company. The Air Force said test activities will take place at Edwards Air Force Base test site 1-56. (submitted by Ken the Bin)

SpaceX has a big launch on Saturday. For the launch of its In-Flight Abort test, the company is aiming to go at the top of a four-hour launch window, which opens at 8am ET (13:00 UTC). During the test, the Falcon 9 will launch a Crew Dragon spacecraft. Then, at an altitude of about 21km, when the launch vehicle reaches a critical velocity, Dragon's

SuperDraco thrusters will ignite for several seconds to pull the capsule away from the rocket—simulating escaping from a rocket disaster. Needless to say, this is a big test for both SpaceX and NASA, which really would like to launch humans from Florida this year.

Bye, bye, Falcon … As for the Falcon 9 rocket used for this mission, its first stage has already flown three missions. It is the very first Block 5 version of the Falcon 9 rocket that SpaceX built and launched, with missions in May, August, and December 2018. It is likely to break up during Dragon's energetic escape and will not be recovered. This breakup may occur shortly after Dragon separation or upon reentry from the upper atmosphere. The second stage will be fully fueled, but since it will not be used during the flight, it will have a mass simulator instead of an actual Merlin vacuum rocket engine.

Dream Chaser on track for 2021 launch. Sierra Nevada Corporation officials said the company remains on track for the first cargo flight of its Dream Chaser spacecraft next year, Space Policy Online reports. The small, space shuttle-shaped vehicle is due to launch on an Atlas V rocket on supply missions to the International Space Station. Although the cargo mission is the first priority, the company says it has not stopped working toward a crewed version of Dream Chaser.

A real space taxi … "There's interest, not necessarily from NASA, but other customers" said Steve Lindsey, a senior vice president for the company. He expects interest to grow once the cargo version is flying. The company will offer either a "taxi model" where it supplies the crew to fly it, or a "rental car model" where the customer provides the crew. It will be up to the customer to decide.

RAND study encourages support for three domestic rockets. An independent study of the space-launch market commissioned by the US Air Force suggests the service should support three providers in the short term to ensure it has access to space over the next decade, SpaceNews reports. The study findings were briefed to Air Force leaders in July, but the report had not been publicly released before SpaceNews obtained a copy.

Four competing for two … The RAND study does not recommend that the Air Force change its decision to award national security launch contracts to just two providers later this year. But it does argue that the Air Force should find a way to keep a third supplier in the national security market as a fallback. United Launch Alliance, SpaceX, Blue Origin, and Northrop Grumman are competing for the two Phase 2 contracts. (submitted by Peterford and Ken the Bin)

Russia is still talking about heavy-lift rockets. As part of a plan to fund development of its Oryol crewed spacecraft (this is the spacecraft formerly known as Federation, which has been in various states of development for 15 years), Russia confirmed its intent to work on two heavy-lift vehicles, Sputnik News reports.

Going to need bigger grains of salt … The inaugural launch of the Angara-A5 heavy rocket is planned for 2023, with testing of the super-heavy Yenisei rocket starting in 2028. Russia is also still holding to the possibility of a crewed landing on the Moon's surface by 2030, which strikes us as highly fanciful. (submitted by Ken the Bin)

Fly me (and you) to the Moon? Yusaku Maezawa, who has purchased the first crewed voyage of SpaceX's Starship vehicle for a cislunar flight, wants a girlfriend. He's promising exotic travel. And he wants to televise it all. For a new documentary, Maezawa will search for a girlfriend to accompany him during his flight around the Moon, The Japan Times reports.

Dear Moon indeed … “As feelings of loneliness and emptiness slowly begin to surge upon me, there’s one thing that I think about: continuing to love one woman,” wrote Maezawa on a website for applicants. “I want to find a ‘life partner.’ With that future partner of mine, I want to shout our love and world peace from outer space.” The documentary on his search for romance, set to be titled *Full Moon Lovers*, will stream on AbemaTV. (submitted by tsunam)

Next three launches

Jan. 16: Ariane V |KONNECT and GSAT-30 satellites | Kourou, French Guiana | 21:05 UTC

Jan. 18: Falcon 9 | Crew Dragon In-Flight Abort test | Cape Canaveral, Fla. | 13:00 UTC

Jan. 20: Falcon 9 | Starlink 3 launch | Cape Canaveral, Fla. | 17:20 UTC

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