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Author: Mr. Erik Kulu  
Estonia, erikkulu@gmail.com

SMALL LAUNCHERS - 2023 INDUSTRY SURVEY AND MARKET ANALYSIS

**Abstract**

The field of small launchers is growing, but there may be some signs of a slowdown. The NewSpace Index ([www.newspace.im](http://www.newspace.im)) has been tracking small launch vehicles since 2016 and has 195 public entries, compared to 150 in the previous industry survey presented at the IAC 2021. The public directory focuses on new private rockets that were, are or will be available on the worldwide commercial launch market. A small rocket is defined as being capable of launching up to a 1500 kg payload to a 700 km SSO orbit.

The first half of this paper will provide an updated statistical overview of small launchers. The development status, payload performance, first orbital launch years, development years and delays, launch costs, geographical distribution, propellant types, reusability plans, and funding amounts will be reported where available.

The second part of the paper will discuss small launcher trends, market size, and competition. Since the previous IAC 2021 study, outcomes have been mixed and delays are still common. Rocket Lab has had positive results, with six launches in 2021 and nine in 2022, including the first from the USA in early 2023. Firefly made it to orbit on their second attempt. There have also been failures. ABL's first rocket launched in early 2023, but the first stage failed. Virgin Orbit failed to make it to orbit during their first takeoff from the UK. Astra and Virgin Orbit went public, but their stocks have not performed well. Astra discontinued Rocket-3 after another failed mission and is focusing on Rocket-4 and propulsion systems. SpaceRyde entered bankruptcy. Some startups, such as Smallspark and Launcher, the latter recently acquired by Vast, have pivoted to space tugs.

The next few years in the small launcher industry will be the most interesting, with many more first and continued launches expected, particularly in Europe, China, and the USA. However, payload readiness may pose a challenge to increasing the cadence and SpaceX's Transporter rideshare missions launching 3-4 times per year are offering strong competition together with orbital transfer vehicles. Whether there is enough market demand for numerous small launchers to achieve economic sustainability remains to be seen, but getting to orbit would at least prove the executability and technology of the companies. Nonetheless, more mergers, pivots, and bankruptcies are likely throughout 2023 and beyond.