



## Blue Origin's Historic Breakthrough

While Elon Musk's and SpaceX's path-breaking and highly public advances in the fledgling field of private space launches are well known to the American public, another tech billionaire with space aspirations, Amazon's Jeff Bezos, has quietly been working on his own private space enterprise, Blue Origin. Known primarily for its secrecy, Blue Origin has been unobtrusively developing its own rocket technology. SpaceX has achieved an impressive string of firsts, including the first private company to put a spacecraft into orbit and the first to reach the International Space Station.



SpaceX has also made impressive progress toward its goal of developing reusable rocket stages, which would greatly reduce the cost of spaceflight. In a series of tests using its "Grasshopper" vehicle, SpaceX demonstrated the ability to launch a rocket thousands of feet in the air and then return it safely to its launch pad. However, when SpaceX began trying to return stages of real orbital rockets to earth and land them on floating platforms offshore, it met with a series of near misses, with incoming rockets toppling over upon touchdown or coming down too hard to avoid breaking apart on impact.

Yesterday, Bezos' Blue Origin beat SpaceX at its own game, becoming the first ever to launch a rocket to space and return its first stage safely to the ground. At its launch site in west Texas, Blue Origin's stocky two-stage suborbital rocket lifted off and soared sixty miles into space, successfully deploying its capsule, which parachuted safely back to earth. The rocket itself then plummeted earthward, and Blue Origin's Bezos explained what happened next, in a congratulatory public statement accompanying a video of the event:

Our unique ring fin shifted the center of pressure aft to help control reentry and descent; eight large drag brakes deployed and reduced the vehicle's terminal speed to 387 mph; hydraulically actuated fins steered the vehicle through 119-mph high-altitude crosswinds to a location precisely aligned with and 5,000 feet above the landing pad; then the highly-throttleable BE-3 engine reignited to slow the booster as the landing gear deployed and the vehicle descended the last 100 feet at 4.4 mph to touchdown on the pad.

Video of this momentous technological breakthrough may be seen [here](#).

It is impossible to overstate the potential significance of Blue Origin's achievement. Reusable rocket technology will reduce the cost of going to space by a huge factor. Up until now, space travel has been prohibitively expensive because, as Elon Musk has pointed out, it involves the equivalent of throwing away and replacing a passenger jet after every flight. While Blue Origin's feat involved a suborbital rocket rather than a more-difficult orbital rocket, the achievement is still an enormous leap forward in the push to make space travel affordable and available to the masses.

Elon Musk, ever the good sportsman, sent a prompt congratulations to Blue Origin. SpaceX itself is



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planning its first launch next month since one of its Falcon 9 rockets broke apart after launch last June. That mishap was one of a series of recent high-profile failures to afflict the private space-travel sector, failures that included the crash of Virgin Galactic's SpaceShip Two and the death of one of its pilots, and Orbital ATK's Antares rocket failure, both in October 2014. Blue Origin's technological triumph is a much-needed dose of good news for private space-travel enthusiasts, and should re-energize all of the players.

None of this is to say that affordable space travel for the everyman is close at hand. Even private space travel is likely to remain the province of the well-heeled for years to come. But Blue Origin and Jeff Bezos have now shone light on the path forward.

*September 15 photo of Jeff Bezos unveiling Blue Origin rocket: AP Images*



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