Funding hopes soar for space tech startups

From Satellite Imagery To Launch Vehicles: India Is Home To Over 140 Space Startups

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Bengaluru/ Hyderabad: Indian space startups are over the moon. Virtually. Many of them have been doing deep technology work for several years now, and some of them have seen notable success, but they need money and private investors have not been terribly excited. Startup founders expect that Isro's success with the moon landing could now change that.

"The Indian space exploration journey has only just embarked upon its most ambitious chapter," Awais Ahmed, CEO of Pixxel, told **TOI** on Thursday. Pixxel, a Bengaluru-based space technology company, was conceptualised by Ahmed and Kshitij Khandelwal in 2019 when they were pursuing undergraduation in BITS Pilani.

Ahmed was part of the student satellite team at BITS. He was also a founding team member and engineering lead at Hyperloop India, the team that built India's first hyperloop pod and was one of the 20 finalist teams out of 2,500 global applicants in the SpaceX Hyperloop Pod competition. It was during this competition that Ahmed and team took the hyperloop pod all the way to the SpaceX headquarters in Los Angeles. Inspired by the visit to the SpaceX factory, Ahmed decided to pursue a career in space tech.

With Khandelwal, he started building AI models **that could take in terabytes of satellite imagery and extract actionable insights from that data to help address problems in agriculture,** predicting yields and tracking the spread of certain crop pests and diseases, among other issues.

But satellite imagery of the earth that was available for analysis in most cases was dated. And Ahmed and Khandelwal found that companies were willing to pay for premium better-quality data. This has led to Pixxel's current mission — building the world's first constellation of hyperspectral imaging satellites.

'More Than Mission Accomplished'

> The Indian space exploration journey has just embarked upon its most ambitious chapter... This is more than a mission accomplished. It's the genesis of a golden era
>
> **Awais Ahmed**
> CEO, PIXXEL

- **Pixxel** is building a constellation of hyperspectral imaging satellites and an AI-powered analytics platform
- **Skyroot Aerospace** launched India's first privately built launch vehicle in 2022
- Hyderabad's **Dhruva Space** has built nanosatellites — the first privately owned and indigenously developed satellites to go into space from Indian soil
- IIT-Madras-incubated **Agnikul Cosmos** has begun integration process of its launch vehicle with its private launchpad

India today has some 140 registered space tech startups. Hyderabad-based Skyroot Aerospace is another one of those that has made significant advances. Late last year, it successfully launched India's first privately built launch vehicle, Vikram-S, into suborbital space. The single-stage rocket was launched by Isro. Twenty seconds after the launch, Vikram-S achieved a hypersonic velocity of Mach-5, which is five times the speed of sound, and hit a peak altitude of 89.5km in 155 seconds. The **6m-long rocket weighing 545kg carried three payloads** of Indian startups — Space Kidz India and N-SpaceTech — as well as an international payload of Armenian BazomQ Space Research Lab.

Another Hyderabad startup, Dhruva Space, has built nanosatellites, Thybolt-1 and Thybolt-2. These have become among the first privately owned and indigenously developed satellites to go into space from Indian soil.

Recently, IIT-Madras incubated Agnikul Cosmos, which began the integration process of its launch vehicle, Agnibaan SOrTeD (SubOrbital Technological Demonstrator), with its private launchpad located at Satish Dhawan Space Centre (SDSC) at Sriharikota.

Agnibaan SOrTeD is a single-stage launch vehicle driven by Agnikul's patented Agnilet engine — an entirely 3D-printed, single-piece, 6kN semi-cryogenic engine. Unlike traditional sounding rockets that launch from guide rails, Agnibaan SOrTeD will lift off vertically and follow a predetermined trajectory while performing a precisely orchestrated set of manoeuvers during flight. These flight **events have been configured to validate key technologies integral to the success of the its upcoming orbital flights. Agnikul plans to complete its first flight in a few weeks.**