Q+A with Dr. Adam London, Astra Founder and CTO

We caught up with Dr. Adam London, Astra Founder and CTO, ahead of the upcoming launch window for LV0006, Astra's third generation rocket, which begins on August 27, 2021. Keep reading to learn about our upgrades since the last launch and Astra's current goals as a company.

So, you're about to launch LV0006 (also known as Rocket 3.3), Astra's third generation rocket. What have you learned since the last launch, and how is this launch different?
The main goals for the launch of LV0006 are to demonstrate that we can deliver a test payload to an appropriate orbit, and gather data on the performance of the system in flight. With our last orbital launch attempt, everything worked quite well. We demonstrated we built a system capable of reaching orbit. But we didn't quite get to that flight's target orbit. We quickly realized what was going on and could have launched again sooner with minor changes. But, each flight is precious, and we wouldn't learn as much as we could if we just fixed the issue. Given how well the rest of the system performed, we decided to complete the remaining planned upgrades, which resulted in Rocket 3.3 aka LV00006, the next version of our launch system. We're excited to test and demonstrate its capability (and learn from it) in this coming launch!

Let's talk about the milestones you've hit so far. This company has only been around for just under five years. What have you managed to accomplish since then?
It has been fast. I think objectively, we are the fastest company from founding to demonstrating a rocket capable of getting to orbit, having done so in four years. Part of that is that we are trying to do something a little bit different. We didn't try to make and solve all the problems on the first go. We built a complete launch system for our first rocket, which we had ready about a year after we started. That allowed us to deploy the whole system and fly the first stage of an orbital-class rocket as quickly as possible. We met our minimum requirements and the learnings allowed us to make some improvements, and we flew Rocket 2, which was better at the end of 2018. In those first two years we realized we were building a rocket that wasn't quite large enough, so we took all our learnings and built Rocket 3. Rocket 3 is a bigger rocket with an improved ground segment, and was built in a little over a year. We entered it in the DARPA challenge and flew two times last year. This year we've made some more upgrades based on the learnings from those flights, which we expect to increase performance and improve the system reliability.

Space is becoming an increasingly crowded industry. How does Astra distinguish itself from other companies in this arena?
The biggest differentiator in my mind is that our main priority is scale. Scale is the way in which you ultimately make a rocket system cost effective. Rockets are typically artisanal, crafted objects. You make one at a time, and they're very complicated. But when you really get into it, they don't need to be that complicated, particularly when you're not flying people or critical national assets, and they don't absolutely, positively have to work 100% of the time.

In many ways, the engineering that goes into a car is more than what goes into a rocket. But they're able to make cars for tens of thousands of dollars. A Cessna airplane is also more complicated than a rocket. But it's built in a factory, and they can make a few hundred of them a year for a few hundred thousand dollars each. You don't find any rockets today that are that affordable. Astra was put together to figure out how you bridge that gap: how you make lots of rockets, so people can leverage easier and faster access to space to do great and interesting things.

Astra's mission is to improve life on Earth. How does a space company do that?
To us, improving Earth means enabling humanity to use this very valuable real estate right above the surface of the planet to make life on Earth better. Our job is to make that as easy as possible. There are two main groups of applications to enable: observing, and connecting the planet. Observing the planet means understanding and identifying changes on Earth, as our customers Planet and Spire, as well as many others, are doing by providing data that allows people to learn about the earth and make better decisions. We can track deforestation, and where people are planting new forests. We can have a better understanding of what's happening in fishing areas, and observe illegal fishing. One of our upcoming

missions with NASA next year is for the TROPICS Mission. We'll help launch 6 satellites that will orbit around the areas of latitude where hurricanes start. They will be on station for an entire hurricane season, and give us much more frequent data about how hurricanes evolve.

Connecting the planet means supporting the many companies that are working to bring communications from space to systems and locations that are not easily covered by conventional terrestrial systems. These kinds of systems range from small systems focused on low-data-rate connectivity of many devices to the large megaconstellations working to provide broadband to the entire earth. There are just a tremendous number of things that we can do in space.

What's your end goal?
Our next objective is monthly, then weekly, and finally daily space delivery. It's a little nuts. But if you have a satellite in orbit and it fails, you need to put another one back there quickly. Or if you want to launch a constellation of thousands of satellites, you don't want to wait six months between launches. Our idea is by launching a few satellites nearly every day to precisely where they are needed, you can have a constellation deployed in a year or two, rather than five years.

Will you be nervous on launch day?
Whenever you make any changes to a system, you're introducing the risk that you are wrong. The thing you change could be your undoing. We've done a lot of testing and risk analysis. But our collective experience is that one should be very humble with rockets.

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Tune in for the live stream of LV0006 with NASASpaceflight during our launch window, which starts as early as August 27, 2021. More details here.

Photo: LV0006 during static testing in August 2021.

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