PROSPECTUS SUPPLEMENT NO. 29
(to Prospectus dated August 12, 2021)

Filed Pursuant to Rule (424)(b)(3)
Registration No. 333-257930

ASTRA SPACE, INC.

Primary Offering Of
15,333,303 Shares of Class A Common Stock

Secondary Offering of
189,026,575 Shares of Class A Common Stock

This prospectus supplement amends and supplements the prospectus dated August 12, 2021 (as supplemented or amended from time to time, the "Prospectus"), which forms a part of our Registration Statement on Form S-1 (No. 333-257930). This prospectus supplement is being filed to update and supplement the information in the Prospectus with the information contained in our Current Report on Form 8-K, filed with the Securities and Exchange Commission on February 14, 2022 (the "Current Report"). Accordingly, we have attached the Current Report to this prospectus supplement.

The Prospectus and this prospectus supplement also relate to the offer and sale, from time to time, by the selling securityholders named in this prospectus (the "Selling Securityholders"), or any of their permitted transferees, of (i) up to an aggregate of 20,000,000 shares of our Class A common stock that were issued to certain investors (collectively, the "PIPE Investors") in a private placement in connection with the closing of the Business Combination (as defined herein); (ii) 7,500,000 shares of Class A common stock issued to the Sponsor prior to Holicity's initial public offering and registered for sale by the Selling Securityholders; (iii) up to an aggregate of 92,277,793 shares of Class A common stock that were issued to certain affiliates of Astra (collectively, the "Astra Affiliates") pursuant to the Business Combination Agreement (as defined herein); (iv) up to an aggregate 56,239,188 shares of Class A common stock issuable upon conversion (on a one-for-one basis) of shares of our Class B common stock, par value $0.0001 per share ("Class B Common Stock") held by certain Selling Securityholders and (v) up to an aggregate of 7,676,261 shares of our Class A common stock issued in connection with our acquisition of Apollo Fusion, Inc. ("Apollo Fusion"), which closed on July 1, 2021 comprised of (x) 2,558,744 shares of our Class A common stock (the "Initial Apollo Shares") issued to certain of the Selling Securityholders on July 1, 2021, in connection with our merger with Apollo Fusion, Inc. ("Apollo Fusion") and (y) 5,117,517 additional shares of our Class A common stock (the "Additional Apollo Shares") which may be issued to certain of the Selling Securityholders assuming (a) the achievement of all remaining performance milestones set forth in the Apollo Fusion Merger Agreement (as defined herein), (b) we elect to pay all future milestone consideration in shares of our Class A common stock as required by the terms the Apollo Fusion Merger Agreement, and (c) the per share price used to calculate the number of shares of our Class A common stock to be issued is $11.7243, which is the same per share price used to calculate the number of Initial Shares issued to the Selling Securityholders. The Additional Shares have not been earned and are not currently outstanding. The actual number of Additional Shares issued to the selling stockholders could be materially greater or less than 5,117,517 shares of Class A common stock depending whether and to what extent the future performance milestones are met and/or the actual average closing price of our Class A common stock at the time such milestones are achieved. The Prospectus and this prospectus supplement also cover any additional securities that may become issuable by reason of share splits, share dividends or other similar transactions.

Our Class A common stock is listed on Nasdaq under the symbol "ASTR". On February 11, 2022, the closing price of our Class A common stock was $3.32 per share.

This prospectus supplement updates and supplements the information in the Prospectus and is not complete without, and may not be delivered or utilized except in combination with, the Prospectus, including any amendments or supplements thereto. This prospectus supplement should be read in conjunction with the Prospectus and if there is any inconsistency between the information in the Prospectus and this prospectus supplement, you should rely on the information in this prospectus supplement.

Investing in our securities involves risks that are described in the *"Risk Factors"* section beginning on page 15 of the Prospectus.

Neither the SEC nor any state securities commission has approved or disapproved of the securities to be issued under the Prospectus or determined if the Prospectus or this prospectus supplement is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is February 14, 2022.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): February 10, 2022

Astra Space, Inc.
(Exact name of Registrant as Specified in Its Charter)

Delaware	**001-39426**	**85-1270303**
(State or Other Jurisdiction of Incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

1900 Skyhawk Street **Alameda, California**	**94501**
(Address of Principal Executive Offices)	**(Zip Code)**

Registrant's Telephone Number, Including Area Code: (866) 278-7217

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Class A common stock, par value $0.0001 per share	**ASTR**	**NASDAQ Global Select Market**

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§ 230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§ 240.12b-2 of this chapter).

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 8.01 Other Events.

On February 10, 2022, Astra Space, Inc. ("Astra") conducted a launch for National Aeronautics Space Administration ("NASA"). The launch was livestreamed through NASA Spaceflight. The video of the livestream is available on Astra's Twitter account (@astra), its LinkedIn account (linkedin/company/astraspace) and its website at www.astraspace.com. Astra has also furnished the transcript of the video from this launch as Exhibit 99.1. This exhibit shall not be deemed filed for purposes of the Securities Exchange Act of 1934, as amended (the "Exchange Act") or incorporated by reference in any filing under the Securities Act of 1933, as amended, or Exchange Act, except as shall be expressly set forth by specific reference in such a filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
99.1	Transcript of livestream video for launch on February 10, 2022
104	Cover Page Interactive Data File (embedded with the Inline XBRL document)

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Date: February 14, 2022

Astra Space, Inc.

By: /s/ Kelyn Brannon
Name: Kelyn Brannon
Title: Chief Financial Officer

Exhibit 99.1

Astra Space Launch 2022

Thursday, 10th February 2022

Thomas Burghardt: Hello, and welcome everybody. You are looking live at Launch Vehicle 0008 on the pad in Cape Canaveral Florida at Space Launch Complex 46. Astra is just under 60 minutes away from conducting a launch for NASA to deploy four CubeSat payloads into low earth orbit on the NASA ELaNa 41 Mission. This is the third launch attempt for Astra and Astra's first mission from Cape Canaveral. We are coming to you live today both from Cape Canaveral Florida and Astra's headquarters in Alameda, California.

My name is Thomas Burghardt. I'm the News Director for NASASpaceflight. And I'm joined by Carolina Grossman, Director of Product Management at Astra. Carolina, thank you for joining me once again today.

Carolina Grossman: Thanks for having me again, Thomas.

Thomas Burghardt: Always a pleasure. We will be bringing you this live coverage of today's mission as we have previously. Astra and NASASpaceflight are once again partnering to bring this broadcast to you, so thank you to Astra for partnering with us to make that happen.

And also, as usual, we will be taking your questions throughout the course of the broadcast. So if you have a question about today's mission, please tag us with @NASASpaceflight in the chat. We're going to be bringing those in through Michael's nifty software and we'll be asking as many of those as we can throughout the course of the broadcast.

Right now we're at T minus 57 minutes and counting, so Carolina let's start off with a status update. What are the teams working on as we proceed towards liftoff?

Carolina Grossman: Sure, Thomas. As you can see that middle third of the rocket is a nice frosty white as propellant load is ongoing onto the vehicle, and all things are looking nominal. And you can see it's also a beautiful day in Cape Canaveral. We are not tracking any weather issues at this time. So we are going to proceed through our countdown with a T-zero time in 56 minutes and 30 seconds.

Thomas Burghardt: The 40—Space Launch Delta 45 and the 45th weather squadron predicted a greater than 90% chance of favorable weather today. And as you can see on your screen, that has definitely played out crystal clear skies hoping for some amazing visuals from today's launch. Liftoff is also on track for the opening of today's window, which is 15.00 Eastern Time, which is again just about 56 minutes from now.

And this mission is the first from Cape Canaveral for Astra. It's launching from Space Launch Complex 46, which is on the Cape Canaveral Space Force Station. Onboard this rocket are also the first satellites which Astra aims to deploy after a successful orbital launch. Those four payloads are part of NASA's ELaNa program, the Educational Launch of Nanosatellites Program. The mission is designated ELaNa 41, also designated the VCLS Demo 2 mission for the Venture Class Launch Services Program, which aims to provide dedicated launch services for small satellites like these CubeSats.

Three of the CubeSats are provided by different universities, the University of Alabama, Tuscaloosa, New Mexico State University, as well as California Berkeley. And then the fourth payload is direct from the NASA Johnson Space Center, all three u-sized CubeSats on board. And those are the payloads on board Astra's first mission to deploy payloads into orbit, like I said.

And as Carolina mentioned, no weather or technical issues right now. The countdown is proceeding. Over the course of the broadcast, we'll also keep you updated how that countdown is proceeding with any updates as needed.

This mission does build off of the first successful orbital launch from Astra, which was the LV0007 test flight out of Kodiak Island, Alaska, and let's take a look at a quick recap which shows how Astra got to today.

Speaker: Ten, nine, eight, seven, six, five, four [inaudible]. Aether confirms good startup.

Speaker: SECO.

Speaker: And Astra's LV007 has successfully reached the orbit. There is a new orbital rocket.

Thomas Burghardt: And we are now going to welcome a special guest to today's live coverage, Hemant Chaurasia, is a Vice President of Product Management at Astra. Hemant, thank you so much for joining the live broadcast today.

Hemant Chaurasia: Thanks so much, Thomas. It's great to be here.

Thomas Burghardt: So I want to talk to you a little bit about what you do at Astra and how you contribute to the team? So your role is Vice President of Product Management at Astra. What are your responsibilities in that role?

Hemant Chaurasia: Yeah, a great question. So I'm part of the product management team at Astra. And you've met Carolina Grossman, one of the stars of our team. Overall, the product management team is really all about answering the question of what is the right thing for Astra to build next, and that's based on understanding what the market is deeply understanding what our customers need and understanding what we can build.

You can imagine that that's a very cross-functional activity. But fundamentally it's about charting that course forward and creating a few different things. One would be our North Star vision for the products that we're building and the roadmap of releases that in step-by-step get us there towards that North Star vision.

Thomas Burghardt: You mentioned this being sort of a cross kind of capability where you have to work with other people. Do you work closely with the engineering and operations teams when you're developing these new products?

Hemant Chaurasia: Yeah, absolutely. Engineering and operations are two very, very critical elements of the company to engage with in answering these questions, but also so many others you know. I think of program management, think of production, sales, mission management, finance, regulatory, spaceports, so many. There's a long list of internal and external stakeholders that every one of them has an important piece of the puzzle in understanding what is the right thing to build next that makes the most progress towards our vision for Astra.

Thomas Burghardt: Well, when aiming to grow your teams in order to pursue that Astra or kind of overall – overarching goal as a company, what kind of skill sets and backgrounds are you looking for to join the product management team to achieve those goals?

Hemant Chaurasia: Yeah, great question. And we're actually hiring very aggressively right now, looking to dramatically grow the product management team this year and as we expand the scope of what we're building at Astra. So your question is a good one. I think there are a few key skills that we really look for. I would highlight four.

The first one is customer obsession. We're really looking for people who are obsessed with understanding who the customers are and what their problems are and how we can help solve those problems. And then bring those insights to the rest of the team as part of our product development process.

Second thing I would highlight is it's important to have combination of technical fluency and business thinking. So product managers in this process, as you can tell, are really a bridge between the business side of Astra and the technical side of Astra. And so it's important to be able to work and speak equally well with both.

Third one is ability to learn fast. You can see on the pad today, our launch system, our most celebrated product at Astra, is really the first of its kind. There are no other container-shippable rockets. And what we're doing is a first in so many different ways. So everybody in the product team really has to be able to learn fast about new technologies, new markets, new types of businesses.

And then the last thing I would say is ability to bring people together, ability to convene, to influence, to really align a broad cross-functional team around a vision for the product, a thing we're trying to do in the world and then to ship that, to work together to bring that into reality. And so these four key skills are intrinsics we look for and we have great people in our team right now.

In terms of backgrounds, I would say that product managers in aerospace are a bit of a rare breed. It's not really a traditional role. So there isn't any cookie cutter formula for background. Certainly, people who have had product management experience at other companies that build mixed hardware and software products, they will have had an opportunity to build many of these intrinsic skills we're talking about. So that's a great background.

But also it doesn't have to be that, and also it doesn't have to be any particular industry. At Astra today, we already have a very diverse range of backgrounds. At Astra, people have come from automotive, from big tech, from aerospace, from all sorts of different industries, and we hugely value that. It's really an important part of the magic at Astra about building something that's fundamentally different as a new future for the space industry.

Thomas Burghardt: And so that team which comes from all of those different diverse backgrounds and experiences is all about coming into Astra to achieve Astra's kind of – or aim towards Astra's long-term goal of improving life on earth and from space. How does today's mission, the LV0008 mission, and your work in the product management team work towards achieving that goal?

Hemant Chaurasia: Yeah, great question. And I love this question. It can never be asked too many times. I think big picture a really important step in improving life on earth from space is to develop the scientific understanding and the scalable technologies that we'll need to build something really useful in space, the next generation of space-based services. That's really what I see as the theme of today's mission in a few different ways. And the four satellites that we're launching today from three awesome university teams and NASA's Johnson Space Center.

The way I look at it, the four satellites we're launching today advance two broad goals. The first one is to help scale up our use of space, and the second is to do that more sustainably. So on the first theme, this scaling up, the first one I'll highlight is the R5-S1 mission from NASA Johnson Space Center.

They're really demonstrating a faster and cheaper way to build CubeSats and simultaneously testing out new ways to get better data on how satellites are operating on orbit. This is very useful diagnostic information for scaling things up.

The second payload that fits in this sort of theme of scaling up is the QubeSat mission, with a Q, from the University of California Berkeley. They're testing out a new kind of quantum gyroscope. A gyroscope is a critical element of every satellite on orbit that helps the satellite understand where it's pointed and where it is. And making these – this quantum gyroscope is one potential path to smaller, lighter and cheaper gyroscopes. It's another way to scale things up in space.

Overall, these two give us new ways to make cheaper and more scale to satellites. On that second theme though, on sustainability, I would say that the first one, the BAMA-1 mission from the University of Alabama, Tuscaloosa, will test a new drag sail, which is a bit like – you can think of it like a parachute in space.

Now to really improve life on earth from space, we need to be able to safely operate thousands of satellites in low earth orbit. And an important part of that is to be able to very reliably bring satellites down when they've either failed or otherwise reached the end of their life. A drag sail is one promising solution to that problem, part of the suite of solutions. And the BAMA-1 mission is taking a really important next step in the development of this technology.

The final payload I'll highlight is the INCA Mission from the New Mexico State University Las Cruces. They're using a neutron spectrometer to take a new kind of measurement of space weather to better understand space weather and predict it. Now maybe many people in our audience don't think about space weather every day. What this really is, is to recognize that our sun is a dynamic and powerful force that's constantly emitting a stream of high-energy particles towards the earth. And that bombardment of the earth creates a space version of weather that satellites need to fly through and operate in.

It turns out that it's really important for satellites to account for this and for us to understand what they need to be designed for in terms of space weather. Just this week, for example, in the news, we saw a large number of satellites lost on orbit purely due to the impact of space weather. So what the INCA mission is doing is really on an important topic to understand and better predict space weather.

I'd say as sort of a backdrop to all of this, there's something here for Astra, which is the launch today is Astra's next step in expanding access to space. Why do we care about that? Well, this is exciting for us because easier access to space means more great student teams and researchers, to flight testing new technologies on orbit. It means more entrepreneurs building valuable space services on orbit and it means more governments and institution building systems that benefit everybody in the world from space.

And I think from my own days as a student at MIT, I've seen firsthand how awesome the innovations can be driven by a team of students and researchers at a university lab. And – but historically, it hasn't been very easy to get those things into space to flight test them.

And so it's – that's why for me it's such a huge honor today to be watching us give an opportunity to fly payloads in space from these great student and researcher teams. And so I'm very excited to see them fly and to see Astra take its next step in expanding access to space.

Thomas Burghardt: Absolutely. Hemant, thank you so much for joining us. I've loved hearing all that insight into both today's mission and your role in the product management team. So thank you so much for taking some questions with us and hanging out.

Hemant Chaurasia: Thanks so much, Thomas.

Thomas Burghardt: All right, let's go ahead and listen into activity on the countdown net as the countdown proceeds at T minus 43 minutes and counting.

Speaker: Okay. First step, 105, Tango in AV1 managed polling. Please toggle do both ground and guidance polling mode.

Speaker: Toggling do both ground and guidance polling.

Speaker: And Tango, I'd like you to re-enable pump battery charging by going into machine pump battery two, manage pump batteries in setting mode three reset machine.

Speaker: Toggling three reset machine.

Speaker: And then mode one, charge pump batteries.

Speaker: Toggling one, charge pump batteries.

Thomas Burghardt: So we're just listening on some countdown steps being proceeded. Again, everything on track right now. We're at just under 42 minutes and counting for today's launch, again, targeted for 15.00 Eastern Time. Like we said, we want to take some questions from chat over the course of today's broadcast. So again, if you've got questions, tag us with @NASASpaceflight and we're going to be bringing a couple of those in. And we got a few of them here now.

Keith is asking about the last launch that Astra conducted, the LV0007 mission. What was the goal and achieved objectives of that mission, Carolina?

Carolina Grossman: Yes, so the LV0007 launch in November, we saw the video of it just a few minutes ago, if you joined us at the beginning of the broadcast. That was our attempt to reach orbit. We have constantly been working towards that milestone.

And LV0007 successfully reached orbit with a test payload on board. And so that test payload on board LV0007 was not deployed. So today's mission LV0008 represents a few firsts. One of them being that this is the first Astra mission with payloads that we will deploy into space, as you just heard a lot about these exciting CubeSats and the scientific investigations that they will conduct.

And it's also our first launch out of Cape Canaveral. So it's a couple of historic firsts for Astra with today's launch and we're very excited to see how it goes.

Thomas Burghardt: And a related question, Arda is asking if Astra can launch payloads into polar or retrograde orbits? And I believe that ties in directly with the launch site that's being used for any particular mission, right?

Carolina Grossman: Right. So if you have been following us for a while, we have launched our previous rockets out of Kodiak Alaska, the Pacific Spaceport Complex Alaska. And that location, which is a very high latitude, is great for reaching high inclination orbits, including polar and SSO.

So yes, we can reach polar orbits. And technically, those retrograde would be flying – launching against the direction of earth rotation. So there's nothing really to prevent us from doing that either. But we're focused on the objectives that our customers want to achieve and a lot of that is driven by our launch location.

So while our Kodiak launch site has been great at helping us reach high inclination orbits, this launch site in Cape Canaveral is really wonderful for reaching mid-inclination orbits, which are particularly important for things like communication and weather observation, where you can get more coverage over the middle portion of the globe.

Thomas Burghardt: Another launch site question here from Matt, could rocket three launch from a boat at sea?

Carolina Grossman: That's a very interesting question. I'll talk a little bit more about our approach to our launch infrastructure. So everything that you see in front of you here can be shipped inside a shipping container. And so, no launches at sea at this time but it does make it very easy for us to set up and deploy a launch site. And even the rocket itself is 43 feet from tip to tail, so that fits inside a 45-foot shipping container, a bit snuggly but it is one of the key differences about Astra, where we can ship everything to the launch site and really all we need when we get there is a concrete pad, an internet connection and a fence to help keep the area safe.

Thomas Burghardt: And we have another question in chat asking about, again, kind of related to launch sites. A lot of launch site questions, which is good, because first launch from Cape Canaveral. It's on topic. Does each vehicle get built slightly differently according to where it's going to end up eventually launch from?

Carolina Grossman: That's a great question. And no, that is one of the things that helps us on our path to scale and really improve life on earth by improving access to launch. So the rockets are built as identically as possible. We may make small tweaks in between because our objective is always to learn and improve our system.

However, those – at this point, those have been pretty minor, especially, given the success of the LV0007 launch back in November. So we do make the rockets identical. It doesn't matter where they are launching from. They are exactly the same. The only difference is maybe any changes in our communication systems to ensure compatibility with the specific range and any special payload adapters that we need for that specific mission, otherwise it's the same rocket regardless of where we are launching from.

Thomas Burghardt: And looking at the launch site a little more closely here, we have a question that we should have known we're going to have, although, this is an interesting interpretation of this question. What are the pylons that look like they'd attract lightning for? Well, you pretty much got halfway there.

Actually on this particular camera view on the very left hand side, you could see the bottom part of one of the lightning protection towers. And they are there, like you said, to attract lightning. It helps protect the rocket. And Space Launch Complex 46 has two big prominent lightning towers seen here as well to help protect the rocket. But of course this pad is actually built for rockets.

It's one of the smaller pads at Cape Canaveral, but still built for rockets that were traditionally bigger than rocket three. So rocket three is just barely poking up over the trees in this view. Even this pad makes Astra's rocket look small because it's dedicated to those small satellites.

Another question here. Paula asks is what makes Astra different from its competitors? What strengths do they have that other providers maybe don't have?

Carolina Grossman: That is a wonderful question. And Astra – our mission is to improve life on earth from space. And the way that we're hoping to do that is by developing the most responsive and affordable orbital launch system. So in terms of responsiveness, what we were just talking about with our ground support equipment fitting in shipping containers being easily able to set up and tear down a launch site in a matter of weeks or days, that's one of our key advantages.

And the reason that that's important as we mentioned is that a lot of the – or orbital destinations that you can reach depend on where you can launch from. So being able to be mobile and agile helps us to provide customers with access to the locations they want.

This system is also really set up by a very small team of folks on the ground and operated by a small team of mission control and support engineers in our facility, which allows us to be really nimble and it's also been really helpful during the COVID-19 pandemic, where it's allowed us to remain as safe as possible and minimize our travel.

And finally, on the affordability front, we take pride in using low-cost materials and trying to lower the cost of access to space with our vehicle. And I believe that, Thomas, you had a tour with our – of our facility with our head of production and that's been an exciting thing to learn a little bit more about how we go through the steps to make our system as affordable and low cost as possible, including staying away from fancy materials like carbon fiber and composites and using as much automation as we can across our system.

Thomas Burghardt: Yeah. Carolina you set me up for a shameless plug here. If you have not seen the rocket factory tour with Bryson Gentile, who was the head – higher up in the production side of things at Astra, who gave us NASASpaceflight a tour of the rocket factory a little while ago, it is on the NASASpaceflight channel.

I highly recommend checking that out, because it's a wonderful insight to how Astra is working to lower their cost through different means, because some companies are looking at reusable rockets and things like that as a means of cutting down price, where other companies such as Astra here, you're talking about revving up production cadence of expendable rockets and simplifying the launch preparations and simplifying the manufacturing, the different materials you choose. Those are the kind of factors you're looking at to reduce launch prices, right?

Carolina Grossman: Yes, exactly. That's right. We take a number of steps in order to make our system as cost-effective as we possibly can. And hopefully our customers can take advantage of that and get more payloads to orbit.

Thomas Burghardt: And speaking of getting those payloads to orbit, we have a question from Redacted. I don't know if that's their actual name or if I just – I'm not allowed to know the name, but we'll go with it. The question is what's today's trajectory? Is it flying direct to east or somewhere else? I believe we even have a graphic to show where the rocket will be headed. And there it is, right on queue.

Carolina Grossman: Yes, so this is the trajectory that the rocket will follow. There will be – we'll be following sort of that middle area. Those blue lines are the NOTMARs, the notices to mariners, the area that boats will keep away from and then the red area is sort of our safe area that we have cleared with the FAA.

So after the rocket clears this trajectory, we'll be flying starting to swing around towards the south again flying over Portugal, Spain, the Sahara desert, Ethiopia. So we'll be hoping for a nominal trajectory as we launch out of Cape Canaveral.

Thomas Burghardt: And if you are down here in Florida along the space coast or even along the Southeastern Coast of Georgia and things like that, assuming the weather is clear where you are, it is very clear here at Cape Canaveral, highly recommend taking a look at this launch because the weather does appear to be pretty favorable for launch viewing.

It is a different rocket than the ones that normally come out of here at Cape Canaveral. So it might look a little bit different, but rocket engines are pretty bright and hopefully you'll be able to catch a view. If you're local to Cape Canaveral, highly recommend this spot here and it's as of Stephen Maher out there in the field near Jetty Park and that is a really great viewing location, the best one for complex 46 because that launch company is actually on the southern tip of Cape Canaveral, pretty close to the Port Canaveral area. So highly recommend heading out here. 31 minutes from now this launch will hopefully be taking place and we'll put on a cool show for the space coast here in Florida.

If you are not local here to the space coast we are, of course, thank you for tuning in to the webcast. Happy to provide you with the views of the launch of this way. And we have a question from Sean, who asks – or excuse me, I'm reading the wrong thing. A different question from K2K81. I don't know what that means, but thank you for your question. Are there any cameras onboard the rocket? And if Michael gets to that cue, he's going to show one of those cameras. There we go. Carolina, what are we looking at on these views?

Carolina Grossman: Sure. So you are looking at the upper stage of LV0008. So that the sort of top right hand side of your screen that is the fairing and we will hopefully see very shortly after Main Engine Cut-off, we will have stage separation and fairing separation. And those fairings will pop open and we'll have a beautiful view of earth as the upper stage ignites to complete the final leg of the mission.

And then this is a view looking upwards at our payloads. So we'll be tracking them as they deploy after SECO or Second Engine Cut-off.

Thomas Burghardt: Love seeing those onboard views. We're hoping to keep those throughout the course of the broadcast and show those much – as much as we can. We've also got these ground cameras, of course. And with perfect visibility, hopefully we'll get some good views from them as well.

I do have a question from PlanetarySpace which is talking about the most recent upboard and scrub if you tuned in earlier, this is not the first launch attempt. Like I said, this is the third attempt for this particular mission. And last time there was that scrub due to that telemetry issue that the teams had to stand down to resolve prior to coming back today. But we saw that abort happen right at engine ignition.

So the question is, what do the teams have to kind of work through when you light a rocket engine and then scrub? Could the engine be damaged from an abort like that or other systems that have to be inspected and things?

Carolina Grossman: Sure. So first to speak a little bit about the abort that happened on Monday, our team conducted a data review after our engine's lit and we learned that the abort was due to the rocket detecting latency in our internal telemetry communication. And it was a bit longer than we typically experienced.

We determined that it was unlikely to have impacted flight, but felt that it needed further review. And after this review, the team was able to identify the probable cause and potential effects and run some simulations to determine that an impact to flight was unlikely and also test some adjustments to improve the latency of the system in preparation for our launch attempt today. So we believe we have solved that issue.

And now more directly to the question, our system is actually designed for multiple ignition events. So we complete a static fire of the vehicle. It's our last major test of the full system. Essentially, we run through our entire countdown procedure, load propellants, light the engines and run them for a few seconds and essentially do everything except actually release the rocket.

So we do design the system to be able to complete multiple ignition attempts, multiple launch attempts without damage or issue.

Thomas Burghardt: Excellent. We're actually hearing that teams are getting into final software config loads now. So let's go back in and listen to the countdown net as those steps are completed at 27 minutes and counting.

Speaker: 15 on engine alpha. Good load.

Speaker: Engine Bravo, 175 Victor 15.

Speaker: Loading config 175, Victor 15 on engine Bravo. Good load.

Speaker: Engine Charlie, 176 Victor 15.

Speaker: Loading config 176, Victor 15 on engine Charlie. Good load.

Speaker: Engine Delta 177, Victor 15.

Speaker: Loading config 177, Victor 15, engine Delta. Good load.

Speaker: Engine Echo 178, Victor 17.

Speaker: Loading config 178, Victor 17 on engine Echo. Good load.

Speaker: Aether, please provide an updated late load config, if you have one.

Speaker: Aether late load config, 183, Victor 8.

Speaker: Loading config 183, Victor 8 on Aether. Good load.

Speaker: GNC, do we have a late load config?

Speaker: Yes, Five Victor 148.

Speaker: Loading config Five Victor 148 on guidance. Good load.

Speaker: Tango and VB1 turn on/off PDBs. Please run a GNC setup. GNC call out when complete.

Speaker: Toggling GNC setup.

Thomas Burghardt: So as you just heard, teams are working on those final software loads and those are going well, T minus 25 minutes and counting, all on track so far. So we'll keep some questions coming. And the liftoff is still targeted for the opening of the window at 15.00 Eastern. There's a question from Sean for Carolina. How big is the launch window today, should any issues have to come up?

Carolina Grossman: Right. That's a great question. We have a one-hour launch window today. So our launch window extends from 12.00 Pacific to 13.00 Pacific. I am blanking on my UTC math at the moment. But we do have a 60-minute launch window. If the – if we encounter an abort or an issue, our recycle time is typically around 15 minutes once that issue is resolved. So there is a possibility that we would be able to try again in the event of an abort. But again everything looks nominal at the moment. So we are not anticipating any issues at this time.

Thomas Burghardt: If I use the time you took to answer that question to do some math in my head, I think that translates to 20.00 UTC to 21.00 UTC for those of us watching or those of you watching from across the globe, thanks for tuning in and that is our launch window for today.

I have another question here from Santosh who asked what engine does the rocket use? And I'll just expand that really quick, because I believe we have a cool view of all the different components of this rocket. Carolina, you want to run us through what makes up a rocket three from Astra?

Carolina Grossman: Sure. So on the left side of your screen, you can see the expanded view of our rocket. We'll start from the left, that is the engine bay. You can see three out of our five first stage engines, the Delphin engines. They are electric pump-fed engines, each producing a thrust of 6,500 pounds for a total of 32,500 pounds of thrust on the first stage.

The next large section is the first stage tanks. And those are filled with LOX and kerosene, liquid oxygen and kerosene, which are our propellants for both stages of the vehicle. The next section is our inner stage, which houses the large portion of the upper stage and our avionics system. Then further right, we have those two spherical tanks and the – and smaller engine with the long nozzle extension. That is our upper stage.

Again, the upper stage is filled with LOX and kerosene just like the first stage, and we have one pressure-fed Aether engine, which produces 740 pounds of thrust. And then finally you see those two split halves of the fairing. And on top, we have – of the upper stage, you can see an example of a CubeSat payload, again, today, it represents Astra's first mission deploying customer payloads into orbit. So we will be keeping an eye for that fairing separation and the payload deployment at the end of our mission.

Thomas Burghardt: Awesome. Chat, please keep the questions coming. If you've got a question, tag us with @NASASpaceflight, that'll help us see your questions and we're going to keep asking those as we get further into the countdown here. The current time is T minus 22 minutes and counting, and all systems are nominal. Let's listen in to the activity on the countdown net as the teams continue to prepare for liftoff in just under 22 minutes.

Speaker: First up, 132 GNC at this time, can you confirm that wind profiles still look acceptable for launch today?

Speaker: Confirmed.

Speaker: Takes us to final igniter checks. Per step 133, Tango, on the buttons interface, please toggle spark for 30 seconds upon completion Delphin, please provide results of spark test.

Speaker: Toggling spark now. Toggling off spark.

Speaker: Delphin, please confirm results of spark test.

Speaker: Delphin confirms good spark.

Speaker: Got it, thank you.

Thomas Burghardt: And you just heard a good spark test, so igniter tests have been completed and the countdown steps are proceeding nominally. We're under—are just about to cross T minus 19 minutes and counting. Everything going well so far. What you were listening there – to there was the mission control teams in Alameda, California, working through those countdown steps. And Carolina, can you walk us through who those team members are and their various responsibilities today?

Carolina Grossman: Sure. So we just have this graphic that has popped up with their names. We'll start from the top left today. So we have Rose Jornales, who's our flight safety – the Flight Safety Officer, is responsible for making sure that we are following our trajectory. Then Christopher Rossi is our GNC, Guidance Navigation Control or trajectory. So he's the one who is keeping an eye on our winds and making sure that we are safe to launch and follow our planned path.

Claire Gauthier is our vehicle controller who with the call sign of Tango, and she is the one who is doing the steps to load the software on the vehicle. She's the one who is the operator of our launch system. Chris May is our Command & Data Handling, or CDH, and he's responsible for monitoring and adjusting any of our state machines, which operate our system.

Hill Hudson is our Flight Activities Officer, or FAO, and he's responsible for documenting the completion of our procedure. Chris Hofmann is our Flight Director, who oversees and directs launch vehicle operations following the countdown manual, and he can call hold, recycle or abort, as required.

And then we don't have a tag for Eric Steinberg, known as Steiny, who is our IT and network point person. You may also hear as we move through the countdown the no – the go, no go poll which is coming shortly.

We have a, what we call, the engineering backroom of the responsible engineers for each of the different systems on the vehicle and our ground support equipment, who are distributed throughout our factory floor at their desks and monitoring all of their systems there.

Thomas Burghardt: In addition to those teams in Alameda, there's another group team – another team out in Cape Canaveral called – known as the Red Team. And can you tell us a little bit about who's out there for us?

Carolina Grossman: Yes, we have a very small and nimble team known as the Red Team out at Cape Canaveral. They're the ones who set up the launch site and do any work required to configure the vehicle and the ground support equipment for flight. We're very grateful for them and hope they're enjoying the beautiful Florida weather, which is much nicer than it would be in Kodiak this time of year.

We have Ryan Hirschfield, our Safety Officer. Adam Fritsch is our Red Lead. Robert Freeman, Eric Larsen, Samm Heerschap, Benjamin Whelan, Rusty Haller, our Red Team. And then we also have in addition to Steiny on our network and IT, we have Thomas Cannon as well. So all of six members of the Red Team are – we're very grateful for all of the work that they do on the ground at our launch site.

They are taking regular COVID-19 tests to protect the health and safety of everyone involved in this mission. And thank you all, huge shout out to you.

Thomas Burghardt: For sure. Right now 15.5 minutes to go. Again, everything on track so far. At the T minus 15 minute mark, there will be the entering of terminal count and that is going to be a big milestone. There'll be some other steps right after that as the teams get into that terminal count followed by a go/no-go poll just over 10 minutes to go in the countdown. So let's go ahead listen into the countdown net. We should have a water test incoming and then entering terminal count.

Speaker: This takes us into Astra terminal count. This time step 142. Tango, confirm that in AV1 managed power systems. We are in ground power system authority.

Claire Gauthier: Confirmed.

Speaker: Tango and VB1 turn on/off PDBs, please run a GNC self-test. GNC call out upon completion.

Claire Gauthier: Running GNC self-test.

Speaker: Okay.

Claire Gauthier: GNC self-test passed.

Speaker: Copy. Ask for safety confirm that FTS is still enabled and nominal in the vehicle.

Speaker: Safety can confirm.

Speaker: Tango.

Thomas Burghardt: As the teams get into terminal count here, let's take a look at the mission timeline of all the events we'll expect to see after liftoff. Carolina?

Carolina Grossman: Sure. Well before liftoff, just a few seconds before the five first stage Delphin engines will light and at T zero if all of the checks pass, we will have liftoff. The hold down mechanisms will release the vehicle and we will be at the beginning of our journey. Just a few seconds in, we'll begin our pitch over maneuver and expect to reach Max-Q at around one minute and 10 seconds, that's the point of maximum aerodynamic stress on the vehicle and a significant milestone to hit in first stage flight.

Then a few things happen in pretty quick succession. At two minutes and 50 seconds, we'll have Main Engine Cut-off or MECO, then fairing separation and stage separation right before the upper stage Aether engine ignites at three minutes and five seconds.

The Aether engine will burn for about 5.5 minutes before Second Engine Cut-off, or SECO, at eight minutes and 30 seconds. And then at eight minutes and 40 seconds, we will begin our payload deployment of our four CubeSats, which will be deployed within a few seconds of one another and we are hoping to get a good view of from our onboard cameras. And if we will – if we have completed all of those steps, we will have achieved mission success and we'll consider today a very good day.

Thomas Burghardt: All right. Let's listen back into the countdown net. We're coming up on that go/no-go polls, where Chris Hofmann will poll the rest of the team for their readiness for launch and hopefully we'll get a go condition to proceed with launch in just over 11 minutes. So let's take – let's listen in.

Claire Gauthier: Toggling off chill, toggling off load first, toggling off load upper, deactivating AUX 4 operating.

Chris Hofmann: Deactivating AUX 10V201 first fill.

Claire Gauthier: Deactivating AUX 10V201 first fill.

Chris Hofmann: AUX 10V401 fill.

Claire Gauthier: Deactivating AUX 10V401 fill.

Chris Hofmann: Deactivate AUX 10V301 upper fill.

Claire Gauthier: Deactivating AUX 10V301 upper fill.

Chris Hofmann: In fuel four operate, please toggle off first and full.

Claire Gauthier: Toggling off first. Toggling off full.

Chris Hofmann: Please deactivate fuel four operate.

Claire Gauthier: Deactivating fuel four operate.

Chris Hofmann: Deactivate fuel three supply.

Claire Gauthier: Deactivating fuel three supply.

Chris Hofmann: Fuel 1FV300 upper fill.

Claire Gauthier: Deactivating fuel 1FV300 upper fill.

Chris Hofmann: Fuel 1FV200 first fill.

Claire Gauthier: Deactivating fuel 1FV200 first fill.

Chris Hofmann: Deactivate AV1 radios.

Claire Gauthier: Deactivating AV1 radios.

Chris Hofmann: And AV1 rocket support card.

Claire Gauthier: Deactivating AV1 rocket support card.

Chris Hofmann: Please confirm zero-stop purging is still enabled.

Claire Gauthier: Confirmed.

Chris Hofmann: AV1 managed polling.

Claire Gauthier: Confirmed.

Chris Hofmann: AV1 managed power systems.

Claire Gauthier: Confirmed.

Chris Hofmann: The helium stack?

Claire Gauthier: Confirmed.

Chris Hofmann: Please activate igniter one spark test.

Claire Gauthier: Activating igniter one spark test.

Chris Hofmann: Please confirm VB1 first stage power is active.

Claire Gauthier: Confirmed.

Chris Hofmann: VB1 upper stage power.

Claire Gauthier: Confirmed.

Chris Hofmann: VB1 turn on/off PDBs.

Claire Gauthier: Confirmed.

Chris Hofmann: Water one water system.

Claire Gauthier: Confirmed.

Chris Hofmann: Tango, please activate launch machine.

Claire Gauthier: Activating launch machine.

Chris Hofmann: With launch activated, please toggle LOX topping.

Claire Gauthier: Toggling on LOX topping.

Chris Hofmann: Okay, team, this brings us to step 151, poll for tank pressurization and launch today. After this point, any system issue must be called as a three-word hold. That is a hold, hold, hold over the net. If there are no concerns for flight, call go, otherwise call no go. Red Lead?

Adam Fritsch: Red Lead is go.

Chris Hofmann: FTS?

Lucas Hundley: FTS is go.

Chris Hofmann: Delphin?

Speaker: Delphin is go.

Chris Hofmann: Aether.

Speaker: Aether is go.

Chris Hofmann: Odin.

Speaker: Odin is go.

Chris Hofmann: Inco.

Speaker: Inco is go.

Chris Hofmann: ACE?

Speaker: ACE is go.

Chris Hofmann: Launcher?

Speaker: Launcher is go.

Chris Hofmann: Orbit?

Speaker: Orbit is go.

Chris Hofmann: Booster?

Speaker: Booster is go.

Chris Hofmann: GNC?

Christoper Rossi: GNC is go.

Chris Hofmann: FAO?

Hill Hudson: FAO is go.

Chris Hofmann: CDH?

Christopher May: CDH is go.

Chris Hofmann: Tango.

Claire Gauthier: Tango is go.

Chris Hofmann: Safety?

Ryan Hirschfield: Safety is go.

Speaker: Flight is go.

Chris Hofmann: Tango and AV1 managed polling, please toggle do only ground.

Claire Gauthier: Toggling do only ground polling.

Chris Hofmann: And let me know when you’re ready to load flight engine sequences.

Claire Gauthier: Ready.

Chris Hofmann: Delphin, please provide.

Speaker: Igniter sequence is 703 Victor 3.

Claire Gauthier: Loading sequence 703, Victor 3 on igniter. Good load.

Speaker: Engine Alpha is 860, Victor 1.

Claire Gauthier: Loading sequence 860 Victor 1 on engine Alpha. Good load.

Speaker: Engine Bravo 861, Victor 1.

Claire Gauthier: Loading sequence 861, Victor 1 on engine Bravo. Good load.

Speaker: Engine Charlie, 862 Victor 1.

Claire Gauthier: Loading sequence 862, Victor 1 on engine Charlie. Good load.

Speaker: Engine Delta 863, Victor 1.

Claire Gauthier: Loading sequence 863 Victor 1 on engine Delta. Good load.

Speaker: Engine Echo 864, Victor 1.

Claire Gauthier: Loading sequence 864, Victor 1 on engine Echo. Good load.

Chris Hofmann: Aether, what can we load for you?

Speaker: Aether sequence today 842, Victor 3, please.

Claire Gauthier: Loading sequence 842, Victor 3, rinse and repeat on Aether. Good load.

Chris Hofmann: Tango and AV1 manage polling, set us back in to do both ground and guidance polling mode.

Claire Gauthier: Toggling.

Thomas Burghardt: All right. You just heard the teams have polled go for launch and are into the final steps before liftoff. Carolina, this mission is about to liftoff. What is the purpose of this mission? Once more – one more for people who are just joining us.

Carolina Grossman: If you are just joining us, Astra is looking to deploy four CubeSats on this mission, BAMA-1 from the University of Alabama, Tuscaloosa, demonstrating a drag sail module that will rapidly de-orbit the satellite; INCA, Ionospheric Neutron Content Analyzer, from New Mexico State University Las Cruces, which is a scientific investigation mission studying the neutron spectrum in low earth orbit for the first time; CubeSat from university of California Berkeley, a technology demonstration to test and characterize the effect of space condition on quantum gyroscopes using nitrogen vacancy centers in diamond; and R5S1 from NASA's Johnson Space Center Houston, demonstrating a fast and cost effective way to build successful CubeSats.

These are being launched on the ELaNa 41 mission, which is selected through NASA's CubeSat launch initiative and provided under a Venture Class Launch Services Demonstration 2 contract which provides dedicated launch capabilities for smaller launch payloads awarded by NASA's Launch Services Program. So we are very thankful to our partners at NASA for providing us the opportunity to complete this mission for our four CubeSat payloads.

Thomas Burghardt: Coming up on T minus five minutes and counting. We're going to go ahead and listen back into the teams as they work through the final minutes of this countdown. And we'll be looking forward to a liftoff again – liftoff targeted for 15.00 Eastern time, which is just under five minutes from now and everything on track so far.

Chris Hofmann: A reminder to all that any three-word hold from here on out it will be an immediate abort regardless of source.

Carolina Grossman: You can see the crew at our Astra headquarters gathering to watch the launch. I'm very jealous of Thomas who will be stepping away from his desk for a moment and hopefully watching our launch in person. Got a nice crowd of spectators over at Jetty Park as well, hoping for a nice view of LV0006 – excuse me, LV0008. Three minutes and 30 seconds.

Chris Hofmann: ROC, this is flight on countdown. Please confirm range is recording telemetry at this time.

Speaker: Confirmed.

Chris Hofmann: Control room if you require RF data in flight, be prepared to switch over your pages. MFCO flight on countdown.

Speaker: MFCO.

Chris Hofmann: MFCO, prepare to issue option when rocket IIP marker passes main MECO point and is within dispersed trajectories calling out an event.

Speaker: MFCO copies.

Carolina Grossman: Two minutes and 30 seconds until T zero of the ELaNa 41 mission.

Chris Hofmann: FTS at this time send a master enable and watchdog on AFTU. Two minutes.

Speaker: Masters enabled watchdogs.

Chris Hofmann: Copy, thank you. 90 seconds. ACE at this time start PSD recordings and downrange ground station recordings.

Speaker: In work.

Chris Hofmann: 60 seconds. Vehicle's on internal power.

Speaker: PSD recordings.

Chris Hofmann: 45, first stage coming up to liftoff pressures. Tanks are pressurized at this time. 30 seconds. 20, 15, 10, nine, eight, seven, six, five, four, three, two, zero.

Carolina Grossman: LV0008 has launched and is on its way to space. You can follow the flight milestones on the left side of your screen, as well as the velocity and altitude of the vehicle. Our next objective is Max-Q.

Should have passed through Max-Q. All systems on the vehicle are nominal and we are tracking it down range. We'll be looking for MECO or Main Engine Cut-off at T plus 2 minutes and 50 seconds. Clear skies provided a great view of LV0008 so far.

Speaker: Flight MFCO options sent.

Speaker: Copy.

Speaker: FTS confirms option detected.

Speaker: Safety can confirm.

Carolina Grossman: That call out of the option means that the system will safely be able to ignite the upper stage after power stage separation.

Speaker: MECO

Carolina Grossman: And that was MECO or Main Engine Cut-off. That was fairing separation and stage separation.

Speaker: Aether is running.

Carolina Grossman: And you can see that the upper stage Aether engine has lit.

Speaker: Opening FV200A. Opening FV300A. Opening OV202.

Carolina Grossman: And it looks like we've lost video of the upper stage and standing by for more information. Thanks for standing by. We're still waiting for more information on the LV0008 mission.

Right now you're seeing a view of our pad at Cape Canaveral, where the team is securing the area. And thank you for standing by with us. Unfortunately, we heard that an issue has been experienced during flight that prevented the delivery of our customer payloads to orbit today.

We are deeply sorry to our customers, NASA, University of Alabama, the University of New Mexico and the University of California Berkeley. More information will be provided as we complete a data review and you can follow along for updates on twitter at Astra as well as on our website, astra.com.

Thomas Burghardt: Yeah. Everyone, thank you for tuning in for today's live coverage. And thank you to Astra for partnering with NASASpaceflight and allowing us to broadcast this launch to everybody, and again, stay tuned for further edits from Astra and from NASASpaceflight. But thank you all so much for watching and stay tuned for more information. But we'll see you later. Thanks everybody.

[END OF TRANSCRIPT]