

**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 March 15, 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 March 14, 2022, the closing price of our Class A common stock was \$3.51 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 March 15, 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): March 14, 2022**

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

**Delaware**  
(State or Other Jurisdiction  
of Incorporation)

**001-39426**  
(Commission  
File Number)

**85-1270303**  
(IRS Employer  
Identification No.)

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

**94501**  
(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. ☐

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**Item 8.01 Other Events.**

On March 14, 2022, we conducted a launch attempt for Spaceflight, Inc. under our multi-launch contract on our launch vehicle LV0009. We terminated that launch attempt due to weather conditions and rescheduled the launch for March 15, 2022 at 9:22 a.m. pacific time. On March 15, 2022, we conducted an orbital launch of LV0009 and confirmed our first delivery of customer payloads into Earth orbit.

Both our launch attempt and the launch and deployment of the payload were livestreamed through NASA Spaceflight. The video of these livestreams is available on our Twitter account (@astra), our LinkedIn account (linkedin/company/astraspace) and our website at [www.astraspace.com](http://www.astraspace.com). We have also furnished the transcript of the video from the launch attempt on March 14, 2022, 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. Once available, we will furnish the transcript of the livestream of our commercial orbital launch from March 15, 2022.

When we use the phrase “commercial orbital launch,” we mean a launch conducted under an FAA commercial launch license.

On March 15, 2022, we issued a press release announcing Chris Kemp, Founder, Chairman and CEO, will participate in a fireside chat at BofA securities’ STAARS Summit Conference on Sunday March 20, 2022. A copy of our press release is included in this current report on Form 8-K as Exhibit 99.2.

**Item 9.01 Financial Statements and Exhibits.****(d) Exhibits**

<u>Exhibit No.</u>	<u>Description</u>
99.1	Transcript of livestream video for launch attempt on March 14, 2022
99.2	Press release issued by Astra Space, Inc. on March 15, 2022
104	Cover Page Interactive Data File (embedded with the Inline XBRL document)

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## 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: March 15, 2022

Astra Space, Inc.

By: /s/ Kelyn Brannon

Name: Kelyn Brannon

Title: Chief Financial Officer

**Astra Space (SCRUB)****March 14, 2022****Corporate Speakers:**

- Thomas Burghardt; NASAAspaceflight.com; News Director
- Carolina Grossman; Astra Space; Director of Product Management
- Amisha Prakash; Astra Space; Senior Manager, Mission Operations and Customer Experience
- Wally Lang; Spaceflight Inc.; Mission Manager
- Amanda Durk Frye; Astra Space; Production Manager, Rocket First Stage
- Chris Hofmann; Astra Space; Manager of Launch Operations

**PRESENTATION**

(Presentation)

Thomas Burghardt: Good morning and welcome everybody. You are looking at a live view of launch vehicle 0009 out on the launch pad in Kodiak Island, Alaska. The Astra teams are just about t-minus 42 minutes away from conducting a launch attempt with the goal of launching multiple payloads for Spaceflight Incorporated. We are coming to you live today from Astra's headquarters in Alameda, California. my name is Thomas Burghardt, news director for NASAAspaceflight, and I'm joined once again by Carolina Grossman director of product management at Astra. Carolina, how are you doing today?

Carolina Grossman: Good. Ready for a launch attempt, Thomas.

Thomas Burghardt: Me too, it's a great day for a launch, thank you all for tuning in today. Astra and NASAAspaceflight are once again partnering to bring you this live coverage. So thank you to Astra for helping make this happen. Also over the course of today's broadcast, as usual, we'll be taking a bunch of questions over the course of the countdown and the launch.

So if you have a question about today's mission or the launch please tag us at NASAAspaceflight in chat, we'll be reading through those and pulling as many of them as we can and trying to answer them. Let's start off with a quick status update on today's launch attempt. We see the rocket out on the pad and the clock under 42 minutes to go.

So Carolina, where are the teams working on now and what's the status of today's launch attempt?

Carolina Grossman: Sure. The team is moving through the countdown steps smoothly and not tracking any technical issues at this time. As you can see from that frosty white middle third of the rocket, propellant has been loaded onto the vehicle, we are closely monitoring the weather this morning in particular triggered lightning, so we will keep you posted as we hear any updates but we are keeping a close eye on the weather and no other issues this morning.

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Thomas Burghardt: Should weather choose to or kind of come up to be a problem at any event or any technical issues come up, they do have a little bit of a launch window to work with today, can you tell us a little bit about what the constraints are today?

Carolina Grossman: That's right, we do have a 27-minute launch window this morning which extends to 9:49 a.m. Pacific Time, 16:49 UTC. It's a short window this morning based on our mission which has a specific local time of the descending node or LTDN and that specifies our short 27 minute launch window this morning.

Thomas Burghardt: And the payloads being deployed into that orbit there's a few of them for all managed by Spaceflight Incorporated, the launch services manager multiple payloads, including customers Portland State Aerospace Society and near space launch going to a sun synchronous orbit, that orbit is inclined 97.5 degrees so this is more or less a polar orbit hence the launch from Kodiak, Alaska.

And also going to an altitude of about 525 kilometers and this is actually the first launch of Astra with Spaceflight Incorporated part of a multi-launch agreement. Right, Carolina?

Carolina Grossman: That's right you can see Spaceflight Astra 1 is our mission name, it's our first launch with Spaceflight, a premier launch services provider and we are very excited to be working with Spaceflight on this mission and future missions.

Thomas Burghardt: The Spaceflight team joined the Astra team here at the headquarters in California to take a look at the payload deployment testing and things like that and we actually have a quick video to show about the Spaceflight and Astra partnership.

(Begin Presentation)

Amisha Prakash: One thing that Astra and Spaceflight have in common is that we're trying to get multiple different types of satellites into space that will benefit the Earth.

Wally Lang: so their core business and the mission of Spaceflight is really to open up access to space to areas that were previously underserved or have sort of unique needs.

Amisha Prakash: Spaceflight has a unique ability of aggregating various satellites into a single launch and Astra has the ability to take multiple different types of satellites that have multiple different requirements and catering to each of those requirements to get those satellites into space.

Wally Lang: I think Astra and Spaceflight can work together very well in the future and our customers all want the same thing right? Which is customizability and an increased cadence. So Astra's goals to scale up and to offer higher capability is something that we at Spaceflight will also value as Astra and Spaceflight work together and build this bond, we can increase efficiency in our sort of processes so that it becomes a bit more of a well-oiled machine.

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Amisha Prakash: Our future launches with Spaceflight will give us that ability to work with even more different types of satellites and provide different functions to help improve life on earth

(End Presentation)

Thomas Burghardt: And I'm now joined by Amanda Durk Frye, senior manager for First Stage Production at Astra.

Amanda, thank you so much for joining us today.

Amanda Durk Frye: Thank you.

Thomas Burghardt: So got a couple questions for you, I want to talk about your role here at Astra, as the production manager, what are your responsibilities here at Astra?

Amanda Durk Frye: So just like any role here at Astra, it's certainly very multifaceted but I do like to break it down into three main areas and that is the people, the build, and the factory itself. So being a manager here at Astra I'm first and foremost a people leader and so a lot of time is spent just connecting with the individuals working on development goals making sure that they're challenged in a right way that really energizes them, that's really going to be the way that we are successful in our mission is to make sure that we really have empowered team members who are building and working on our rockets.

And then there's the vehicle build. So the First Stage Production team currently has around 20 team members who weld, drill, rivet, integrate and test, take the vehicle from engineering drawing to reality and as a production manager, it's not only my under — my responsibility to understand the overall build materials but also what design changes are coming through from engineering and figuring out how those changes are going to make their way onto all the vehicles that are currently on the production line since at any given time we might have multiple vehicles on our line.

And with that comes such an important need to document everything that we're doing. So working extensively with our quality and manufacturing engineering teams to make sure all the photos are taken of everything that we're doing that our notes are really extensive, that way we can take a snapshot in time of what work has been performed on the vehicle so we can go back later and assess kind of where we were with the build process.

And then lastly it's also the coordination of all of those efforts, we have really tight build schedules and really tight launch operations that we have to make sure the vehicle is ready for.

And then also the factory is that last responsibility. So here at Astra, we actually treat our factory as a product so with the production managers as one of the main customers for that product, and so a lot of time is spent with working with the product managers to make sure we really well documented like what's going well with our processes or where are the gaps like where do we have room for opportunity in order to really make our production process a lot more efficient?

Thomas Burhardt: And when you're talking about First Stage Production, what does that entail? We're looking at a view of the rocket here, how much of that falls under your jurisdiction basically?

Amanda Durk Frye: Right so actually everything that you see visually on the rocket is the First Stage if you once you load the upper stage onto the vehicle then it becomes the rocket assembly so I can step through the various components so from aft end to forward end which for those not familiar with that terminology, the aft end would be the bottom of the screen, forward end is the top of the screen.

So the aft end, we have our five main first stage engines and surrounding those are thermal protection just to make sure all the engine controllers are protected during the high heat environment during the initial ignition. Moving up we have the fuel and liquid oxygen tanks and so the fuel is obviously closest to the engine bay with the liquid oxygen tank sitting just above it, that's where we have the nice frosty look from the cryogenic fluid in there.

At either end of the tanks, we have valves sensors just to make sure everything is well regulated and monitored during flight and then those are also connected by a raceway that goes down the length of the vehicle and in there are primary harnesses as well as plumbing lines.

Moving forward to the aft end, there's also the interstage that's the conical white section that has the Astra star and the flag on it, so that's where a lot of our avionics are housed and it's also the primary means of holding on to the upper stage during flight.

And then once main engine cutoff happens and after the fairing separation the interstage is what releases the upper stage and then lastly, at the forward end those are the two fairings and so my team has two main sub-teams underneath it the integration and the structures team so the structures team is led by Kirsten Saunders and so her team basically takes a lot of raw materials and from either the machine shop or from outside vendors and they'll form all of the metallic structures that you see.

So they'll form the fuel and liquid oxygen tanks, they do the primary structures for the interstage as well as the fairings. And then [Aaron Burnham] is the leader on the integration team and so his team actually takes the different components from the other production teams here at Astra so he'll grab the engine bay from the engine team, the upper stage and all the avionics components and he'll actually integrate the overall first stage assembly and then he'll integrate the upper stage with the vehicle as well do all of the final checkouts and to make sure that the vehicle is going to operate as expected during flight.



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We'll also load up the vehicle onto the Strongback which is that large metallic structure that you see up to the left and then we'll load all of that into a box and send it on its way so.

So essentially the first stage is a lot of what you see here so it's a pretty wide, pretty broad area of involvement on the production floor here and is essentially the vehicle that gets the upper stage high enough to take over the flight and deliver customer payload to orbit.

Thomas Burghardt: All right. And then producing that stage here at Astra, how does that differ from the way other Spaceflight companies or other launch providers handle their production ?

Amanda Durk Frye: Sure, so you know here at Astra we're working to really change the way rockets are thought of across the industry. Our main engineering focus for vehicle production is not really on chasing the next big design that's going to disrupt the industry but really looking at iterative innovations that really enable mass production of these rockets at volume in order to lower the cost and make space as accessible as possible for everyone.

So it really comes down to design materials and processes so for design, it's fundamentally important to design for manufacturing and part of that is to include the manufacturing and production team as early in the process as possible. So my build technicians are encouraged to provide feedback to the engineering team of like they are building on the floor and if something can be done a little bit better or if a part can be refined a little bit they'll provide that feedback to the engineering team that'll be incorporated into the design. Particularly on those production processes that really enable us to scale to production levels that are unprecedented in the industry.

In materials, so we're not working with exotic materials that are difficult to come by or take a long time to manufacture over 95 percent of our bill of materials contains non-single source, easy to manufacture materials that are equally as easy to use and form on the factory floor, and that said two the processes are that third item, and so we're really using tried and true forming and joining processes that are standard in the aerospace, marine, or even automotive industries.

So it's about really optimization about how we utilize our engineering and manufacturing resources and looking at simple scales.

The production process is about taking a sophisticated design and really breaking it down into smaller more manageable build operations that are reliable and repeatable, and really comes down to hiring the right talent also to really own those key production areas.

Thomas Burghardt: And for that that key talent that's such a crucial part of your team, what kind of backgrounds and skill sets are you looking for when you expand your team?

Amanda Durk Frye: Sure that's an excellent question since we are constantly hiring here at Astra. This past year we held several really successful hiring events and upcoming in 2022 will definitely be holding more of those events where we hire build technicians engineering development technicians and even red team members, it's actually a fairly common development path for our technicians to cycle onto red team since they're the ones who have a lot of the experience working with the vehicle here on the production floor that can easily be translated to the launch site.

Thomas Burghardt: Right.

Amanda Durk Frye: And so above all else when I'm hiring really looking for a great cultural fit into our organization our team works really hard here but they also take really good care of each other.

And we truly appreciate a wide variety of technical skills really anyone who has automotive experience or the marine industry or even aircraft mechanics have the right skill set to be able to build our rockets. The structures team, any metal forming, welding, riveting are really strong qualities that we look for in our technicians and for the integration team a little more sophisticated there definitely on a good understanding of plumbing lines and like safety of pressurization around equipment and a basic familiarity with instrumentation, electrical harnesses, and just general comfort navigating software systems in order to do the checkouts' really good.

And for any technician or manufacturing engineer that I'm interviewing one of the things that I'm always looking for is somebody who got involved in the process at their prior role and really stepped outside of their comfort zone.

So I really loved seeing persons who tackled large projects that they felt initially wholly underprepared for and asked the right questions or found the right persons to really help guide them through the process and to be successful, and if they weren't successful, what did they learn from it and how do they how do they adjust their processes moving forward?

Really just looking for someone who's just as passionate about building rockets as we are here. I love that just minutes after the LV0007 launch, one of my technicians texted me and he was just blown away by the magnitude of what we achieved and his part in it.

He thanked me for hiring him and so that's really that's the passion that I love to see on our team here.

Thomas Burghardt: That's awesome. I do actually have one more question for you and it's because I think you have another story to show, the team tells me that there was an interesting moment recently around the birth of your baby girl?

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Amanda Durk Frye: Yes, yes, so I guess to back up a little bit I did find out that I was expecting the day before I started at Astra.

Thomas Burghardt: Okay.

Amanda Durk Frye: And so I was joining a very, very fast-paced startup since this was before we went public last year so I was judging through those really slow first months of pregnancy while facing this type of environment which is a challenge in of itself.

Fast forward a few months and we were working we were a few days away from shipping LV0007 and I was with my team on the production floor finishing up the aft end of the rocket when my water broke and it was six weeks early too so totally unexpected but it was fantastic to see my team jump into action, I felt like all of them were ready to like drive me to the hospital right then and there.

Thankfully it didn't come to that but it was my little one was born a few days later, it's very exciting time on the production floor here,

Thomas Burghardt: There you go.

Amanda Durk Frye: There she is, that's little AJ wearing her little astronaut onesie but yes, we just like to joke that since she was my little sidekick during the build of LV0006 and LV0007 that she was just too excited to join the world and so it was really great that we she wasn't supposed to be out yet but we were able to watch the launch as a family.

Thomas Burghardt: That's very cool. Amanda, thank you so much for joining me today and answering the questions love to talk more to you about this kind of stuff, it's very cool.

Amanda Durk Frye: Yes.

Thomas Burghardt: Again if you are watching and you have questions about today's launch, we're starting to get those in and we're going to start going through those again, tag us at NASASpaceflight if in the meantime we're going to go back to our pad views and listen into the countdown net for some activity currently at t-minus 27 minutes and counting. Stay tuned.

<b>QUESTIONS AND ANSWERS</b>
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Thomas Burghardt: And welcome back to our coverage. Again, t-minus 25 minutes and counting, and we're keeping an eye on weather so a lot of these questions coming in have to do with that. So let's start here. Jonah asked what are the chances of violation today? Astra is known for multi-hour launch windows, today only a 27-minute launch window, so but is Astra still capable of having an extended hold or something if they're waiting for a weather criteria?

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Carolina Grossman: Sure. So we do have a very short launch window today. I'm, the chances of the triggered lightning causing a violation are relatively high this morning. So we are keeping a close eye on that. We would only be able to hold or recycle within our launch window this morning which again is very short due to the mission requirements for the local time of the descending node or LTDN.

So we're keeping an eye on that, I've seen a lot of questions as well around rain and other factors, our team takes into account the weather, many different weather factors but rain is not something that particularly impacts the rocket on the ground although it does make work a little tougher for our red team, our team of field engineers who is up in Kodiak and we are great — very grateful for them working in those conditions to help keep our launch site set up on time and safe.

Thomas Burghardt: You mentioned triggered lightning as the main criteria that everyone is looking at on these camera views, we're seeing some rain come in and out is that a factor for today's launch?

Carolina Grossman: We're not tracking any other issues this morning aside from that triggered lightning concern, so the rain that you may see starting and stopping is not an issue.

Thomas Burghardt: Got you. And a question from Tim here, how does Astra monitor these different weather conditions, are there weather balloons sounding rockets or satellite data stuff like that?

Carolina Grossman: Right, we do use a number of sources of weather data but the most real-time source of data that we get is from weather balloons that are deployed at predetermined points throughout our countdown. Our team receives the input from those weather balloons and we are able to adjust the trajectory in real time and use the most up-to-the-minute information about whether to ensure that LV0009 has a safe trip to orbit.

Thomas Burghardt: All right. Again keep the questions coming and we will keep you updated on the status of the weather criteria as the countdown continues. You can see the clock is still ticking, that is towards the opening of the window at 9:22 a.m. Pacific Time and we'll just stay tuned to see if how weather cooperates or doesn't cooperate during today's launch attempt.

But to keep the questions coming, we do have a question, how has Astra been able to overcome the recent launch failure? Of course LV0008 not reaching orbit successfully. We talked a lot or I actually talked a lot about the investigation and the results from that, can you tell us a little bit about what has been changed to prepare for this mission?

Carolina Grossman: Right, so first of all, I'll plug our blog, if you visit [astra.com](https://astra.com) you can read a really, really excellent post by Andrew Griggs, our senior director of mission management who talked about the failure investigation process as well as what we what we learned after the flight of LV0008, and there were two issues.

One was that the payload fairing didn't separate fully after or right around the time of upper stage ignition and that was due to an error in an engineering drawing that caused the separation mechanisms which there are five on that fairing to deploy in the incorrect order. and the other issue is a software problem that resulted in the upper stage engine being unable to use its thrust vector control system which was ultimately due to a an issue with packet lost.

So both of these issues our team was able to work very thoroughly to identify on the fairing harness, we were able to fix that incorrect engineering harness drawing and incorporate that change throughout our system and we also implemented a new end-of-the-line signal test to help us mitigate this issue prior to launch.

And then on the software side, we made several updates to make our system more resilient to packet loss and other similar failure modes but this is again part of our approach of iteration testing eliminating failures as we find them and we've overall made our system much more robust, these are part of our core values here at Astra and part of our culture and we're very grateful for all of the hard work done by our engineering teams as well as by the FAA for working with us through the investigation process.

Thomas Burghardt: It is definitely notable how quickly it has been turned around from that failure to returning to flight definitely something that is not normal in the aerospace industry to be honest.

Keeping the questions coming, got some questions about the Astra rocket, which combustion cycle is used on the Rocket 3 engine? Well there's two different types of engines so you want to run through them both?

Carolina Grossman: Sure, that's right, we have two engines on LV0009, we have the five first stage engines known as the Delphin engines are electric pump fed engines, each of the our first stage engines produces 6500 pounds of thrust and there we have a great exploded view of the Astra rocket.

The upper stage engine is known internally as the ether engine, is a pressure fed engine there's only one of them on the upper stage producing 740 pounds of thrust and both engines use liquid oxygen or LOX and RPX which is essentially kind of a mineral spirit a highly refined form of kerosene, we use the same propellants for both engines.

Thomas Burghardt: And keeping the questions coming, let's see is there onboard video or do you have a good data relay coverage for this launch?

I believe we should expect some onboard camera views and there you have it, this view is on the first stage of the rocket looking up towards the upper stage and the payloads mounted on top and then we've got a view on the upper stage looking back down towards the first stage so you can just see the outline of the second stage engine bell there and the top of the interstate section, so hoping those views will stay online as well during the course of today's launch.

Also if we weren't sitting on a pad encompassed by condensing air around a very cold rocket you would see the outside of the rocket looking down the side there once the rocket is actually in flight, that view will probably become a little bit more clear, but that should be a great view as well. And again that depends on you know how healthy the radio signals during the launch is sometimes they can cut out here and there but we will hope that those camera views stay with us because they are definitely very cool views.

Speaking of camera views, we have a question here in chat that we are obligated to answer every single stream. What are the two black towers for at the launch pad?

Carolina Grossman: Well those are the lightning protection systems, so those are lightning rods, lightning towers to prevent any lightning strikes on the ground from striking the rocket while it is on the pad and of course we are still keeping an eye on that triggered lightning which happens once the rocket is in flight and could potentially pose a risk to the rocket successfully completing the mission, so we are keeping an eye on that triggered lightning.

Thomas Burghardt: We talked a little bit earlier about the launch window obviously weather being the big factor today listening into the countdown at all the steps are going as planned actually even slightly ahead of schedule, so nothing concerning on the technical side of things right now.

The launch window for today we mentioned earlier was 27 minutes it turns out that the COLA window or a collision on launch avoidance window at the very end of the window has been cleared, so we're back up to a 29 minute launch window so just a quick update there, 29 minute launch window which extends to 16:51 UTC or 9:51 a.m. Pacific Time for those watching at home.

To keep the questions coming we got a question from Ty's Adventures that asks how fast can Astra launch? The Astra is kind of built around a quick deployment and launch kind of model, right?

Carolina Grossman: Yes, that's right. So we are very proud of the ability to launch quickly learn quickly and iterate so we launched just a little over a month ago was the LV0008 mission and now we are back here on the pad with LV0009, a different launch site in Kodiak, so we are able to show that we are able to launch about once a month at this at this point and part of what makes our system so unique and flexible is that much of what you see here on your screen actually fits inside standard sized shipping containers.

So the rocket fits in a standard 45 foot shipping container, the strong back, that black sort of ladder-like structure you can see retracted back from the vehicle fits as well and all of our ground support equipment does fit in standard shipping and logistics options which allows us to very, very quickly set up respond to issues and be ready to fly again as we've demonstrated following the LV0008 mission.

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Thomas Burghardt: I also have a question here from Jonah talking about the payloads on today's flight asking since today's payload will not be separated from the fairing, how many of those systems resulting from lv8 be tested on this vehicle? To be clear first and foremost, only one of the payloads on today's mission is not being deployed, there is the s4 crossover payload from near space launch that is a hosted payload that'll stay on the upper stage and operate from there for a couple weeks, but the other payloads on board today's mission will be deployed like normal satellites including the Portland State Aerospace Society's ORSAT Zero payload in addition to other non-disclosed payloads at this time.

So but resulting from that I mean any systems that are different or are not going to be tested on today's flight because of that hosted payload?

Carolina Grossman: That system, the hosted payload is entirely self-powered so we expect everything to proceed as normal, we've completed our standard battery of tests on these vehicle — and we've just received her a notice that we are holding the clock at T minus 15 minutes for weather.

Thomas Burghardt: Like we mentioned earlier triggered lightning criteria has been being watched over the course of today's countdown, the window extends 29 minutes so a little bit of a window to work with the countdown could lead to a TZR as late as 9:51 a.m. Pacific Time and we'll stay tuned on updates as the teams look at their weather data and determine if a launch attempt is viable today, but again in a hold at just about t-minus 15 minutes due to weather, we'll keep you updated as more info comes in.

Meanwhile we can keep taking some questions while we wait for further updates, a question from Jade Trains asked where is the payload going today?

Carolina Grossman: That is a wonderful question so our payloads are going to a sun synchronous orbit, we're going to an inclination of 97.5 degrees and 525 kilometer altitude for the Spaceflight Astra 1 mission today.

Thomas Burghardt: And that kind of mission profile dictates the launch that you're going to right because this is one of two launch sites that Astra currently has active and Kodiak lends itself to those high inclination, those polar orbits.

Carolina Grossman: Yes, that's exactly right so one of the great advantages of working with Kodiak and launching out of Kodiak is the easy access to those polar and sun synchronous orbits so I want to just take a moment to shout out to our partners, the Alaska Aerospace Corporation, the Pacific Spaceport Complex Alaska and everyone in Kodiak that has welcomed us and been wonderful to work with over the last several years of Astra's launches.

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Thomas Burghardt: Another question about the payload. Timothy just asked what type of satellite is on this rocket?

Carolina Grossman: Sure. We have we have a few payloads but we will talk about and highlight two of them, one is the Near Space Launch S4 crossover which is actually not being deployed, it will stay on the upper stage, it's a technology demonstration mission for a type of payload host platform and what this mission or this payload will test supporting future payloads and has a lot of environmental instruments to help characterize radiation and plasma density.

As we mentioned, it is self-powered and operates completely independently of the Astra system and it will remain permanently attached starting from when the system turns on after second stage engine cut off or SSECO and the other the other payload we'll highlight is the Portland State Aerospace Societies ORSAT Zero which is a fully open source Cubesat satellite system which was built from scratch by students at Portland State University, it is slated to be Oregon's first satellite and it's a 1U Cubesat that provides flight heritage for a modular expandable open source and education friendly ORSAT bus and paving the way for a future 2U Cubesat with a global climate science and STEM outreach mission.

So those are two of the payloads on board today that we are very excited to highlight, and again this is our first mission with Spaceflight, the launch services provider, we are very excited to be working with them on this Spaceflight Astra 1 mission.

Thomas Burghardt: And looking forward to future missions as well, part of a multi-launch agreement between Spaceflight and Astra, Spaceflight a very prevalent commercial mission manager for many different launch vehicles now including Astra's Rocket 3.

I do have a fun question here from Musical Wools, we'll ask will there be pie if today's launch succeeds? It is Pi Day so.

Carolina Grossman: It is Pi Day, I certainly hope so it is it is an early morning that the teams have spent here preparing for today's launch attempt and so I can hope that we will celebrate with pie.

Thomas Burghardt: Sounds good to me. Again, if you are just joining us we are at T minus 15 minutes and holding due to weather criteria the teams are looking at weather data and determining if there could be an attempt today, the launch window extends until 9:51 a.m. Pacific Time or 16:51 UTC so we have a little bit of time for the teams to work this issue. No technical issues being worked. The vehicle is in great shape.

Other questions here, Samara asking about what we can see on the screen right now, why does it look like the rocket is smoking? It's not smoke rather than like vapor, right?



Carolina Grossman: Yes, that's right, so what you can see sort of those long plumes of what appear to be smoke are just vent lines off our system and the rocket itself appears to kind of be almost smoking in that frosty white area that is liquid oxygen that is our liquid oxygen tank which due to the moisture in the atmosphere has some condensation and appears to be smoking, it's kind of similar to you know if you pull ice cream out of the freezer on a warm day, you can kind of see that that ice cream container look like it has some smoke coming off it, that's exactly what you're seeing happen right now is just this very, very cold substance here that is letting off steam.

Thomas Burghardt: And we can actually use that as an indicator of where the different fuel tanks are because the liquid oxygen is of course very cold so that part of the tank is where that frost is forming, but at the bottom of the rocket, you can see just the bare metal skin without that frost building up and that's because the kerosene fuel, the RPX that's being used is at ambient temperature right? That's not chilled any more than ambient temperature and so it doesn't generate that frost.

Carolina Grossman: Yes, exactly, so the liquid oxygen tank is that upper part of the first stage kind of the middle third of the overall integrated vehicle and then we — you have the fuel tank beneath that which is why you can see that aluminum.

Thomas Burghardt: Another question here from Brandon who asked as a shareholder, can I request to view a launch at the Cape?

Carolina Grossman: There are actually plenty of great launch viewing locations from the Cape, I think Thomas, you're the expert there.

Thomas Burghardt: I know.

Carolina Grossman: For some great launch viewing spots you can share.

Thomas Burghardt: Well the Launch Complex 46 which hosted Astra's most recent launch from the Cape and there are more Cape Canaveral launches coming for Astra. The best part for that is the Port Canaveral area if you want to go to Jetty Park that's the 10 out of 10 my recommendation, you can also go pretty much anywhere in Port Canaveral you'll be pretty close to that launch pad or the beach that's just south of that the jetty beach because the launch pad that Astra uses is actually the very southern tip of Cape Canaveral and you get a great view from there. So stay tuned for future launch by Astra down there because honestly it's probably one of the best view launch pad views you can get because of that pad at the southern tip.

So stay tuned for future launches and definitely some great viewing locations.

Tudor asking about the fairing issue encountered on the previous flight and asking how has that problem been addressed for today.

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Carolina Grossman: Right, so if you're just joining us we have a great blog post up on our website that details what we discovered during our investigation as well as what we've done to mitigate it but for those of you who are just joining us now, the fairing issue was the fairing did not did not separate nominally during the LV0008 flight due to an error in an engineering drawing that caused the separation mechanism to fire in the incorrect order of the fairing.

So what we've done about that issue is we fixed the drawing of course, we implemented the fix on the hardware that we have already built and we added a new test that we have completed for LV0009 that will allow us to identify this type of failure in the future prior to launch. So we can report that that issue has been resolved and mitigated for the future.

Thomas Burghardt: Seeing some questions in chat about some of the merch that Astra has you can see we got the hoodie on right now and we do have a question where can folks watching at home maybe get involved with some Astra merchandise?

Carolina Grossman: Well, we're very happy to share that we have opened the Astra Shop. The Astra Shop is now live at [shop.Astra.com](https://shop.Astra.com) and we are also especially excited to share that for the next two weeks we will be donating 100% of the profits to charities offering humanitarian services in Ukraine right now, so visit [shop.astra.com](https://shop.astra.com) and you can see what we have available.

We have a pretty small selection right now like we always like to do we like to learn and iterate. So (multiple speakers). Yes so we'll learn the kind of products that all of you folks who have been supporting Astra and watching at home are interested in purchasing and we'll expand our selection from there and again 100% of the profits for the next two weeks will go to humanitarian efforts in Ukraine including the Red Cross, World Central Kitchen and UNICEF.

Thomas Burghardt: That's very cool that you're doing that and a big thank you to Astra for their support of that endeavor and I go, yes, go check out the Astra shop, it's pretty cool. We get that question every stream and now we finally have that answer for it which is pretty cool.

Carolina Grossman: Very exciting, thank you so much to our team here at Astra that made that possible so we are looking forward to sharing our Astra merch with the world now.

Thomas Burghardt: Do have a question there's a couple people in chat asking about that tank structure that we talked about earlier with the liquid oxygen on top and the RPX kerosene on the bottom, is there a reason for that particular order?

Carolina Grossman: Well we can I think that's just how this the system was designed.

Thomas Burghardt: Maybe we'll get back to you on that we'll have to wait and see, but that is you can just see it very visually, some rockets it's harder to see because the both the fuel and the oxidizer are both chilled so you can't actually tell which tank is which but on the Astra rocket, it's nice and visible.

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Carolina Grossman: Yes and we do again use the same propellants on both stages which is another way we keep our design really, really simple to help scale our system and operations.

Thomas Burghardt: Again if you are just joining us the clock is still holding at t-minus 15 minutes we're standing by to hear word about the weather criteria for today whether it has caused the hold no technical issues being worked but the triggered lightning criteria has been a concern for today's countdown.

Let's go ahead and listen in and take a view at the launch pad views while we wait for more information on that. Again we'll share that as soon as we have it.

So if you are just joining us, we are still holding a t-minus 15 minutes due to a weather criteria, you notice that the countdown is pretty quiet, the teams are still waiting for some weather data to confirm whether or not the launch attempt can proceed for today against the launch — the launch window extends until 9:51 a.m. Pacific Time or 16:51 UTC, and that means that we should get a decision one way or another within the next 15 minutes or so.

So we're going to keep you updated on that and as soon as they have that data and make that decision, we'll of course, share that with you.

But we do have some more questions coming in and one is pertaining to the weather situation actually asking what is the triggered lightning criteria that the teams are looking into today?

Carolina Grossman: Yes that's a great question so triggered lightning is a phenomenon where as the rocket moves through the atmosphere and you know encounters electrically charged fields in the atmosphere it can act as a giant lightning rod and can cause lightning to strike the vehicle and potentially damage it and risk the mission, so unfortunately it's not something that we have a lot of control over just like the rest of the weather, but it is a pretty unique phenomenon and that's what we are keeping track of today.

Thomas Burghardt: Of course if you're a regular NASASpaceflight viewer and you listen really closely to the intro reel, the SCE to AUX call out from Apollo 12, I believe, I hope I got that mission right, oh god my Apollo history isn't the best but that was actually a lightning strike that occurred during launch and caused all sorts of electrical issues so those weather criteria are developed over years and years of launch experience and apply to all the rockets that are launched from various launch ranges around the world.

So again the teams are looking into that triggered lightning criteria and will let us know as soon as they make a decision one way or the other, still holding and hoping out for a launch attempt today.

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If things do end up not going that way today and we need to target a new launch attempt, when is the next launch window, Carolina?

Carolina Grossman: So we do have another launch window tomorrow at the same time so that is 16:22 to 16:51 UTC or 9:22 to 9:51 am Pacific Time so we do have another launch opportunity at the same time tomorrow, it is still that same shortened window due to the requirements of this mission, the payloads heading to an orbit with a specific local time of the descending node or LTDN which is dictating our short launch window for this vehicle.

Thomas Burghardt: Looking at this launch pad we've got the beautiful shore of the ocean and some mountains in the background, is this the same pad up in Kodiak, Alaska that launched the LV0006 mission?

Carolina Grossman: That's right, we have had many launches out of this pad in Kodiak Alaska including the LV0006, 0007 missions and many other prior Astra missions and hopefully more to come as we really appreciate our partnership with the Pacific Spaceport Complex Alaska, the Alaska Aerospace Corporation and everyone up in Kodiak that we so enjoy working with, so thank you to the team at Kodiak for their partnership with Astra.

Thomas Burghardt: Yes, we talked a lot about in previous coverage when national was flying the test flights out of Kodiak that the relatively not as busy launch range and the sort of remoteness of the launch area makes it really good for test flights, but now that you're moving into operational missions there are actual payloads on board this flight, it's still very useful because it has really good access to those polar high inclination orbits the sun synchronous orbit that today's mission is going to so expect it to remain a normal part of the rotation for Astra missions?

Carolina Grossman: Exactly, one of the big advantages of launching from Kodiak is the orbital inclinations that we have access to, it looks like we have a view there of the trajectory for today's mission and the keep out zone which I believe is those blue areas one very close to the pad and one further away as well as the rocket trajectory should fall right down the middle between those two red lines right there, so that is the path that that LV0009 will take out over the Pacific Ocean towards orbit.

Thomas Burghardt: And talking about the mission profile and the payloads on board, SV asked what is the mission profile for today's flight?

Carolina Grossman: Sure so we are heading to a target orbit of a 97.5 degree inclination and an altitude of 525 kilometers for the LV0009 flight, the Spaceflight Astra 1 mission, it's our first mission with Spaceflight as a launch services provider we're very exciting to be working with today.

Thomas Burghardt: And the payloads on board there are three different customers for Spaceflight Incorporated on today's flight, one of which will not be deployed the near space launch s4 crossover payload that we talked a little bit about earlier a hosted payload on the upper stage of the rocket, there is also a Cubesat for the Portland State Aerospace Society ORSAT Zero is one of the payloads that will be deployed from today's mission or assuming today if the weather cooperates, again, if you're just joining us still waiting on some weather data and in under 10 minutes, we'll have a decision one way or the other whether the countdown can proceed looking at the triggered lightning criteria that's affecting the countdown right now.

Might have some new viewers to the Astra program, Astra still a pretty new launch provider in the industry and this is a pretty small rocket, it's a dedicated rocket for small satellites. So Mateo is asking how tall is this rocket?

Carolina Grossman: Yes, that's a great question so the rocket you're seeing here is 43 feet long from tip to tail with a diameter of 52 inches and that that 43 feet is significant because that means that our fully integrated vehicle can fit inside a 45 foot shipping container, making our system very, very flexible and portable.

Thomas Burghardt: And another question regarding Astra's launch systems? Does the rocket have a name other than LV0009, so there's a couple names we've thrown out there LV0009, there's Rocket 3, Rocket 3.3, what are all those different naming conventions talking about?

Carolina Grossman: Sure. So LV0009 stands for launch vehicle 0009, that's the tail number of the vehicle like the tail number of an aircraft or the VIN number of your car, it's this specific version or this specific mo vehicle of the overall model which is rocket 3.3 and so rocket 3.3 means that it was an iteration of our rocket 3 series, so that is kind of [like similar to] like a software release you know if you have your iPhone you might have IOS you know version 15.1 or 15.3, and that's a similar approach that that we take because it's so important to us to iterate make changes and learn just as we've done between the LV0008 and 0009 missions.

So those are some of the naming conventions that that we use so LV0009 is an Astra rocket 3.3.

Thomas Burghardt: Yes, so basically there are multiple rocket 3.3 that's a model number that can be built many times again but there is only ever going to be one LV0009. Right?

Carolina Grossman: Exactly.

Thomas Burghardt: Yes, I got you. Have a cool question, Chat, we showed the trajectory a little bit earlier and it shows that the flight is not flying east, is that unusual? It is unusual for some missions a lot of missions do tend to fly east from their respective launch sites because that helps you take advantage of the spin of the earth, it actually makes it easier to reach orbit, however for this particular mission that would not be helpful because these payloads are going to a sun synchronous orbit, they are intended to go to orbits that orbit kind of over the poles, it's a 97 and a half degree inclination which means that the angle between the orbit and the equator is 97.5 degrees.

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And in order to do that obviously you can't fly east because then you won't be flying over the poles you'll be flying over the middle of the planet.

That's also why when launching from Kodiak Alaska which is up closer to the poles it's actually better for these kind of missions. You have all that room south of the launch site to fly south towards a polar orbit and also you have less spin from the Earth start with your basically starting velocity at your launch site which means it's easier to reach those orbits.

Earlier, the LV0008 mission was targeting a more mid-inclination orbit which is why they launched from Cape Canaveral, Florida which is closer to the equator and has all the ocean east of the launch site so you can launch in that direction, so it totally depends on the mission, it's a case-by-case basis and the sun synchronous orbits are also a very common orbit for especially small satellites to launch into.

So it's not that uncommon, it all depends on the mission.

Samara has a question, how many stages are there on the Astra rocket 3 vehicle?

Carolina Grossman: So this is a two-stage vehicle, we have the first stage which is powered by five first stage engines that are electric pump fed engines with 6,500 pounds of thrust and the second stage has a single pressure fed engine which produces 740 pounds of thrust we have that lovely expanded view of the system so starting from the left you can see those engines in the engine bay, then we have those first stage cylindrical tanks, we have the cone-shaped interstage and then we have the upper stage which kind of has two spherical tanks kind of looks like a sideways snowman and that upper stage engine and finally the two halves of the of the fairing. And that is that is LV0009 that you are seeing on the launch pad today.

Thomas Burghardt: And timothy has a question what will happen to the payload that is not being deployed today once the launch happens? How will it eventually be destroyed?

Carolina Grossman: Great question so we expect that payload that is the Near Space Launch S4 crossover which will remain permanently attached to the Astra second stage, it will transmission will begin right after a second stage engine cutoff or SECO and it will operate until its demise which is expected a few weeks after launch so it will remain attached to the upper stage and operate for several weeks.

Thomas Burghardt: And that's all about just natural orbital decay in low earth orbit it'll naturally decay in a few weeks time.

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Carolina Grossman: That's right the orbit of the upper stage will naturally decay I'm not certain if the payload's life span is less than that or will continue to operate until the upper stage naturally deorbits.

Thomas Burghardt: Got you. Again if you have questions about today's launch please feel free to keep them coming in chat with tagging us at NASASpaceflight, still in a hold at t-minus 15 minutes right now, the teams are waiting for some final data in about three minutes here we're expecting a decision one way or the other because again at 15 minutes in to go in the countdown the window extend until 9:51 a.m. Pacific Time, 16:51 UTC, it is coming up on the deadline to make a decision one way or the other should it be a no-go, there is a backup launch opportunity tomorrow, but we're standing by for official word on today's attempt still holding out hope that the team will be able to make a go towards the end of today's window. But we'll keep you updated as soon as we have more information.

Chris Hofmann: This is Astra flight on countdown, Astra is scrubbing for the day due to triggered lightning not improving for the rest of the launch window.

Thomas Burghardt: And as you just heard the flight director for today's flight, Chris Hofmann has called a scrub for today due to the triggered lighting criteria not cooperating for today's window, ran out of time unfortunately, there is another backup launch opportunity tomorrow same time the window opens at 9:22 a.m. Pacific Time 16:22 UTC from Kodiak, Alaska hoping that LV0009 can get off the pad tomorrow.

I hope you'll come back and join us for that coverage, Carolina, thank you so much for joining me today.

Carolina Grossman: Thank you, Thomas, hopefully we'll get it off tomorrow.

Thomas Burghardt: Hopefully I hope you'll come back for that, stay tuned for future space news coverage here on NASASpaceflight. Thank you all so much for watching. Hope to see you tomorrow.



### **Astra CEO to Participate in BofA Securities STAARS Summit Conference**

ALAMEDA, California – March 15, 2022 – Astra Space, Inc. (“Astra”) (Nasdaq: ASTR), today announced that Chris Kemp, Founder, Chairman and CEO, will participate in a fireside chat at BofA Securities’ STAARS Summit Conference on Sunday, March 20, 2022.

- Fireside chat hosted by BofA Securities Analyst Ron Epstein on Sunday, March 20, 2022 at 8:30 p.m. (ET) / 5:30 p.m. (PT).

A live webcast, as well as a replay, will be available on the Company’s investor relations website at

<https://investor.astra.com/news-and-events/events-and-presentations>.

### **About Astra Space, Inc.**

Astra’s mission is to improve life on Earth from space by creating a healthier and more connected planet. Today, Astra offers one of the lowest cost-per-launch dedicated orbital launch service of any operational launch provider in the world. Astra delivered its first commercial payload into Earth orbit in 2021, making it the fastest company in history to reach this milestone, just five years after it was founded in 2016. Astra (NASDAQ: ASTR) was the first space launch company to be publicly traded on Nasdaq. Visit [astra.com](http://astra.com) to learn more about Astra.

### **Safe Harbor Statement**

*Certain statements made in this press release are “forward-looking statements”. Forward-looking statements may be identified by the use of words such as “anticipate”, “believe”, “expect”, “estimate”, “plan”, “outlook”, and “project” and other similar expressions that predict or indicate future events or trends or that are not statements of historical matters. These forward-looking statements reflect the current analysis of existing information and are subject to various risks and uncertainties. As a result, caution must be exercised in relying on forward-looking statements.*

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