



# PREFIRE & ICE

PRESS KIT | NET 1 JUNE 2024

Rocket Lab USA, Inc.  
[rocketlabusa.com](http://rocketlabusa.com)

  
ROCKETLAB

# LAUNCH INFORMATION

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## MISSION

Rocket Lab will launch the second of two back-to-back Electron launches for NASA's PREFIRE mission from Rocket Lab Launch Complex 1, New Zealand.

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## LAUNCH SITE

Launch Complex 1 – Pad B  
Mahia, New Zealand.

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## LAUNCH WINDOW

Time Zone	Window Opens
UTC	03:00
NZST	15:00
EDT	23:00 (day prior)
PDT	20:00 (day prior)

Back up opportunities are available throughout May and into June should the launch date need to be updated for any reason.

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## ORBIT

# 525km



## SATELLITES

# 1

PREFIRE-2

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## INCLINATION

# 97.5

Degrees

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## CUSTOMER

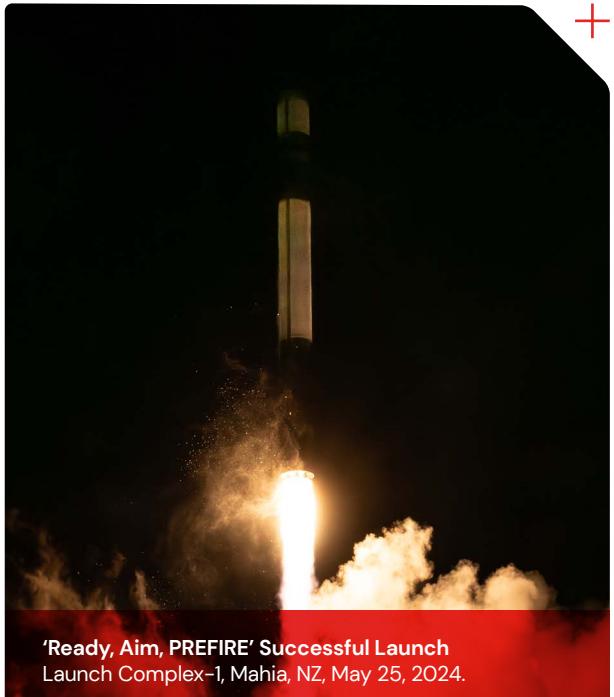
# NASA

A large black and white photograph of a Rocket Lab Electron rocket launching. The rocket is oriented vertically, with its fairing open at the top. The word "ELECTRON" is printed vertically along the side of the fairing. A trail of fire and smoke is visible at the base of the rocket, indicating it is in flight. The background is dark, suggesting it is nighttime or the rocket is launching from a dark site.

# MISSION OVERVIEW

About 'PREFIRE and Ice'

'PREFIRE and Ice' is the second of two launches on Electron to deploy NASA's PREFIRE (Polar Radiant Energy in the Far-InfraRed Experiment) mission.



'Ready, Aim, PREFIRE' Successful Launch  
Launch Complex-1, Mahia, NZ, May 25, 2024.

This launch of the second CubeSat for PREFIRE follows the successful deployment of the first CubeSat by Electron on May 25th, 2024.

The second satellite will be deployed to the same 525km circular Earth orbit on a similar but different trajectory to the first satellite, so that both will crisscross each other every few hours near the poles. It's along these orbital paths that PREFIRE will measure the heat lost to space from Earth's polar regions in the form of infrared radiation. The data will help to improve climate and ice models, and provide better predictions of how the planet's sea level and weather are likely to change in the future.

Each satellite is fit with specially-shaped mirrors and detectors for splitting and measuring infrared light, and will make its readings using a device called a thermocouple, similar to sensors found in household thermostats. PREFIRE will supply scientists with new data on a range of climate variables, including atmospheric temperature, surface properties, water vapor, and clouds.

# PREFIRE MISSION

Going to the ends of the Earth to combat climate change



## Two small satellites, one important climate change mission.

NASA's PREFIRE mission, short for Polar Radiant Energy in the Far-InfraRed Experiment, is tasked with measuring heat loss from both the Arctic and Antarctica, in an aim to help researchers better understand Earth's energy budget.



How does that relate to climate change? It all comes down to how much of the Sun's energy Earth retains. Ideally, the amount of heat the planet receives should be balanced by the amount that radiates out. The difference between incoming and outgoing energy determines Earth's temperature and shapes our climate.

The Arctic and Antarctic help to regulate Earth's climate by radiating a lot of the heat initially absorbed at the tropics back into space. But for regions like the Arctic, about 60% of that heat escapes to space in the form of far-infrared wavelengths that haven't been systematically measured.

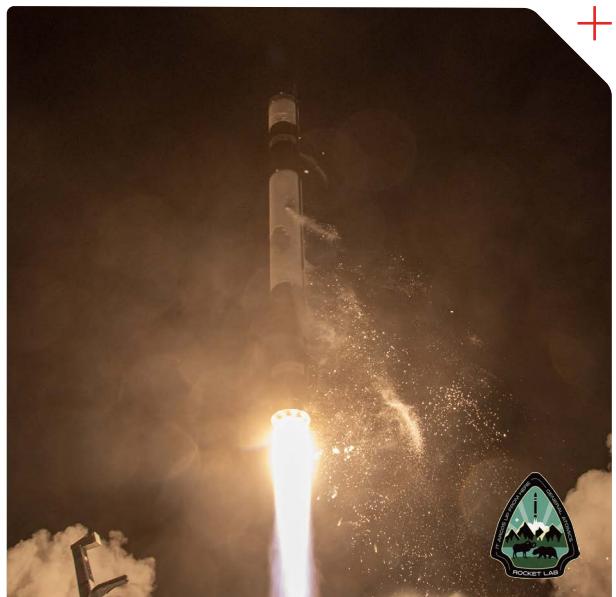
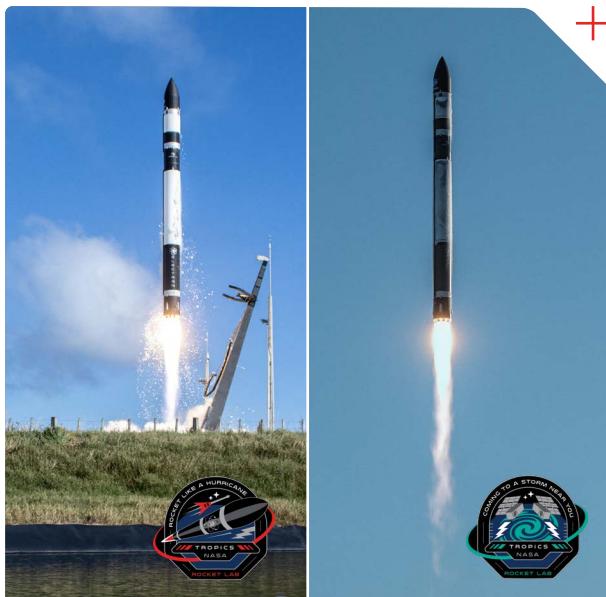
Changes at Earth's poles can influence global weather patterns and affect sea level rise.

The climate data collected by PREFIRE will help to provide a more accurate read of the future of some of Earth's coldest, most remote regions -- and in turn, the future of our planet.

# FIGHTING CLIMATE CHANGE FROM SPACE

## Other Rocket Lab missions

Just because satellites might be small, doesn't mean they can't support big science. We're proud to have launched numerous missions on Electron focused on weather and climate change – ranging from storm tracking and weather monitoring.



### TROPICS

- **Customer:** NASA
- **Mission Objective:** Data collection from global sensors monitoring Earth's physical and biological environment, including weather and climate.
- **Launches:** Rocket Like A Hurricane, Coming To A Storm Near You. Launched May 2023.

NASA's TROPICS constellation monitors the formation and evolution of tropical cyclones, including hurricanes, and provides rapidly updating observations of storm intensity. This data will help scientists better understand the processes that effect these high-impact storms, ultimately leading to improved modelling and prediction. Rocket Lab launched the constellation across two separate missions on Electron in May 2023.

This observing system offers an unprecedented combination of horizontal and temporal resolution to measure environmental and innercore conditions for tropical cyclones on a nearly global scale and is a profound leap forward in the temporal resolution of several key parameters needed for detailed study of high-impact meteorological events.

### ARGOS

- **Customer:** General Atomics, NOAA, US Space Force's Space Systems Command
- **Mission Objective:** Monitor the formation and evolution of tropical cyclones and hurricanes.
- **Launch:** It Argos Up From Here. Launched October 2022.

The Argos-4 payload is part of the international Argos program that collects data from thousands of sensors and transmitters located around the world. Argos data is collected and distributed for use in numerous applications, and helps provide a better understanding of Earth's physical and biological environment, including its weather and climate, biodiversity and ecosystems, as well as assist with maritime security, offshore pollution, and humanitarian assistance. Information gathered via the Argos system also enables industries to comply with environmental protection regulations. Argos has most famously been used to track wildlife, particularly marine mammals and sea turtles since the 1980s. There are currently 22,000 active transmitters around the world that the Argos system is monitoring, with almost 7,800 tracking wildlife.



## MATS

- + **Customer:** Swedish National Space Agency
- + **Launch:** Catch Me If You Can. Launched November, 2022.

Electron launched a science research satellite by space systems provider OHB Sweden for the Swedish National Space Agency (SNSA) in November, 2022. The payload, called MATS for 'Mesospheric Airglow/Aerosol Tomography and Spectroscopy', was the basis for the SNSA's science mission to investigate atmospheric waves and better understand how the upper layer of Earth's atmosphere interacts with wind and weather patterns closer to the ground.



## PLANET

- + **Customer:** Planet Labs
- + **Mission Objective:** As the leading provider of daily data and insights about Earth, Planet helps organizations harness change for action with a multidimensional view of our changing planet.
- + **Launches:** multiple Electron missions since 2018.

Planet designs, builds, and launches small Earth-imaging satellites that image Earth's landmass daily to help researchers, students, businesses, and authorities discover patterns, detect early signals of change, and make timely, informed decisions. Rocket Lab has launched multiple Planet smallsats across three Electron missions since launches began in 2017. SNSA's science mission to investigate atmospheric waves and better understand how the upper layer of Earth's atmosphere interacts with wind and weather patterns closer to the ground.



## CARE WEATHER

- + **Customer:** Care Weather
- + **Launch:** They Go Up So Fast. Launched March, 2021.

The Veery Hatchling mission was a test of Care Weather's vertically-integrated satellite power, computing, and avionics systems in a 1U CubeSat. It paved the way for Care Weather's future constellation of scatterometric radar weather satellites capable of producing hourly maps of global wind speed and direction over the surface of the ocean. Veery Hatchling was the first step in Care Weather's mission to save lives and livelihoods by better forecasting Earth's extreme weather.

Here are examples of how Planet's satellites are helping to make Earth a better place.



### Helping To Monitor The Melting Arctic

Geologists from Arizona State University conduct research on Axel Heiberg Island in the Canadian High Arctic where, high above the Arctic Circle, weather conditions can change dramatically with little notice.

With the aid of Planet data, not only can the team monitor the island's Planet satellite imagery of glaciers on Axel Heiberg Island weather conditions from afar and make better decisions about how to spend time and resources, the images from Planet's satellites also inform their research into melting permafrost.

With the effects of climate change causing the ground beneath Arctic communities to melt and shift at a rapid rate, Planet's data and the work of the Arizona State University's research is helping scientists to recognize the melting and devise strategies to help these communities avoid any loss of lives from impending hazards like landslides, sinkholes, and severe flooding.



### Saving The World's Coral Reefs

Coral reefs are under attack. As oceans warm while the climate changes, coral bleaching that has significantly degraded these important ecosystems has been found to have occurred in 93 of the 109 countries where coral reefs are found. At that alarming rate, more than 90 percent of coral reefs are at risk of dying by 2050 if nothing is done about warming temperatures. Planet provides data and imagery to map the world's shallow-water coral reefs and monitor them for change.

# LAUNCH SITE OVERVIEW

## Rocket Lab Launch Complex-1

Mahia, New Zealand



'PREFIRE and Ice' will lift off from Launch Complex 1 on New Zealand's Mahia Peninsula.

An FAA-licensed spaceport, Launch Complex 1 can provide up to 120 launch opportunities every year. From the site it is possible to reach orbital inclinations from sun-synchronous through to 30 degrees, enabling a wide spectrum of inclinations to service the majority of the satellite industry's missions to low Earth orbit.



Located within Launch Complex 1 are Rocket Lab's private range control facilities, two 100K satellite cleanrooms, a launch vehicle assembly facility which can process multiple Electrons at once, and administrative offices.

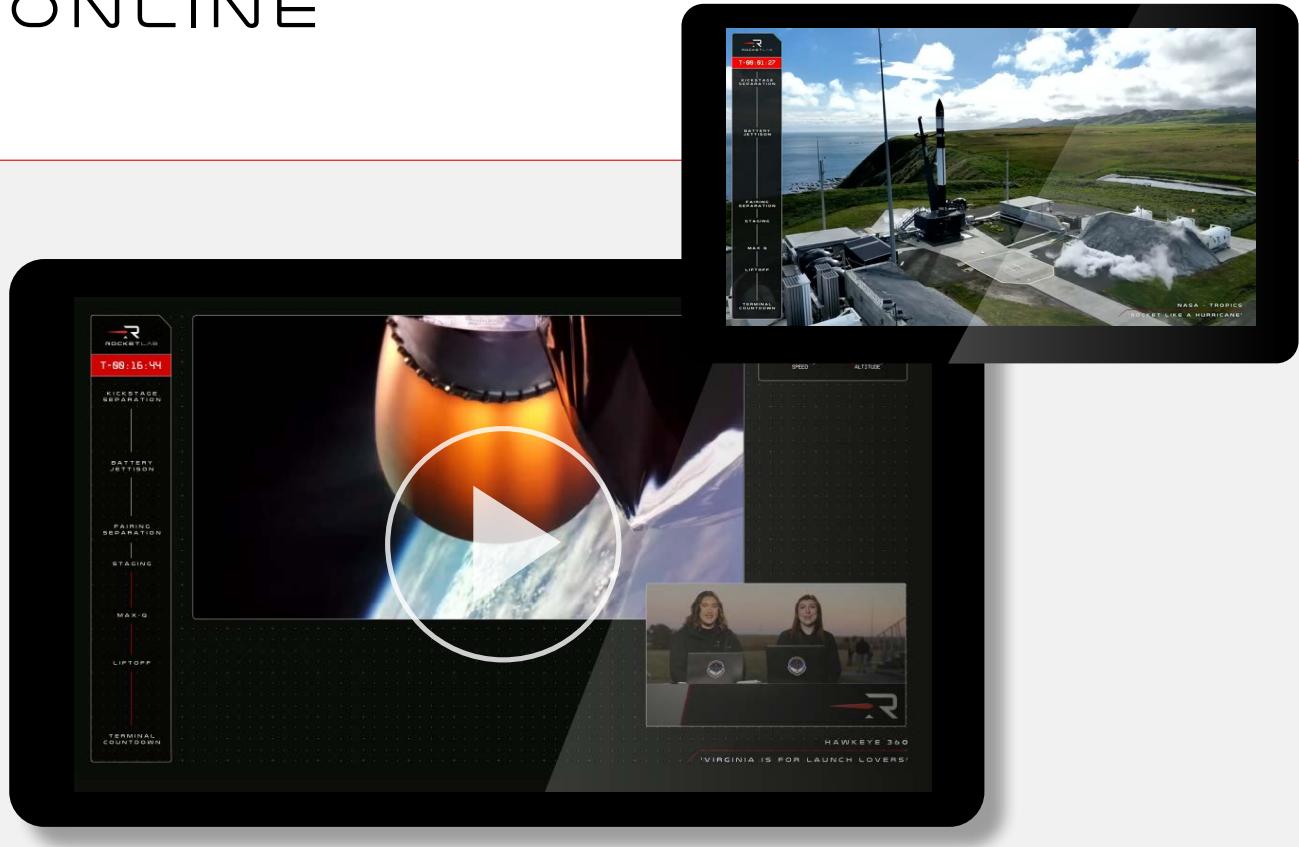
Operating a private orbital launch site alongside its own range and mission control centres allows Rocket Lab to reduce the overhead costs per mission, resulting in a cost-effective launch service for satellite operators.

In addition to Launch Complex 1, Rocket Lab operates an additional launch site, Launch Complex 2, at the Mid-Atlantic Regional Spaceport within NASA's Wallops Flight Facility on Virginia's Eastern Shore. Launch Complex 2 can support up to 12 missions per year.

By operating two launch complexes in two hemispheres, Rocket Lab provides customers with flexible, responsive launch opportunities.



# VIEWING A LAUNCH ONLINE



## LIVE STREAM

The live stream is viewable at:

[rocketlabusa.com/  
live-stream](http://rocketlabusa.com/live-stream)

## UPDATES

For information on launch day visit:

[rocketlabusa.com/next-mission](http://rocketlabusa.com/next-mission)

## LAUNCH FOOTAGE & IMAGES

Images and footage of "PREFIRE and Ice" launch will be available shortly after a successful mission at:

[www.flickr.com/photos/rocketlab](http://www.flickr.com/photos/rocketlab)

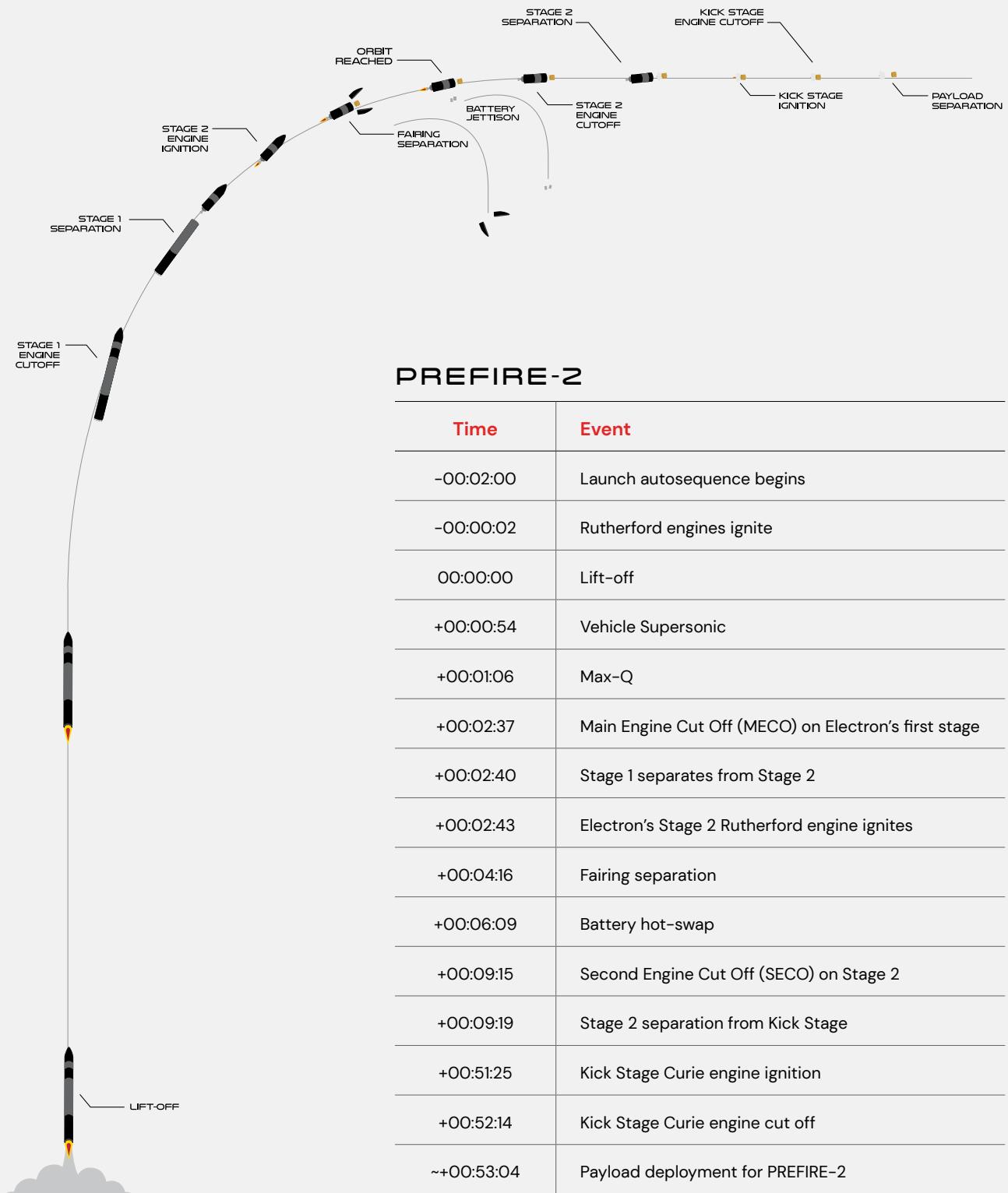


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# TIMELINE OF LAUNCH EVENTS



# ELECTRON LAUNCH VEHICLE

## OVERALL

### LENGTH

18m

### DIAMETER (MAX)

1.2m

### STAGES

2 + Kick Stage

### VEHICLE MASS (LIFT-OFF)

13,000kg

### MATERIAL/STRUCTURE

Carbon Fiber Composite/Monocoque

### PROPELLANT

LOX/Kerosene

## PAYOUT

### NOMINAL PAYLOAD

320kg / 440lbm To 500km

### FAIRING DIAMETER

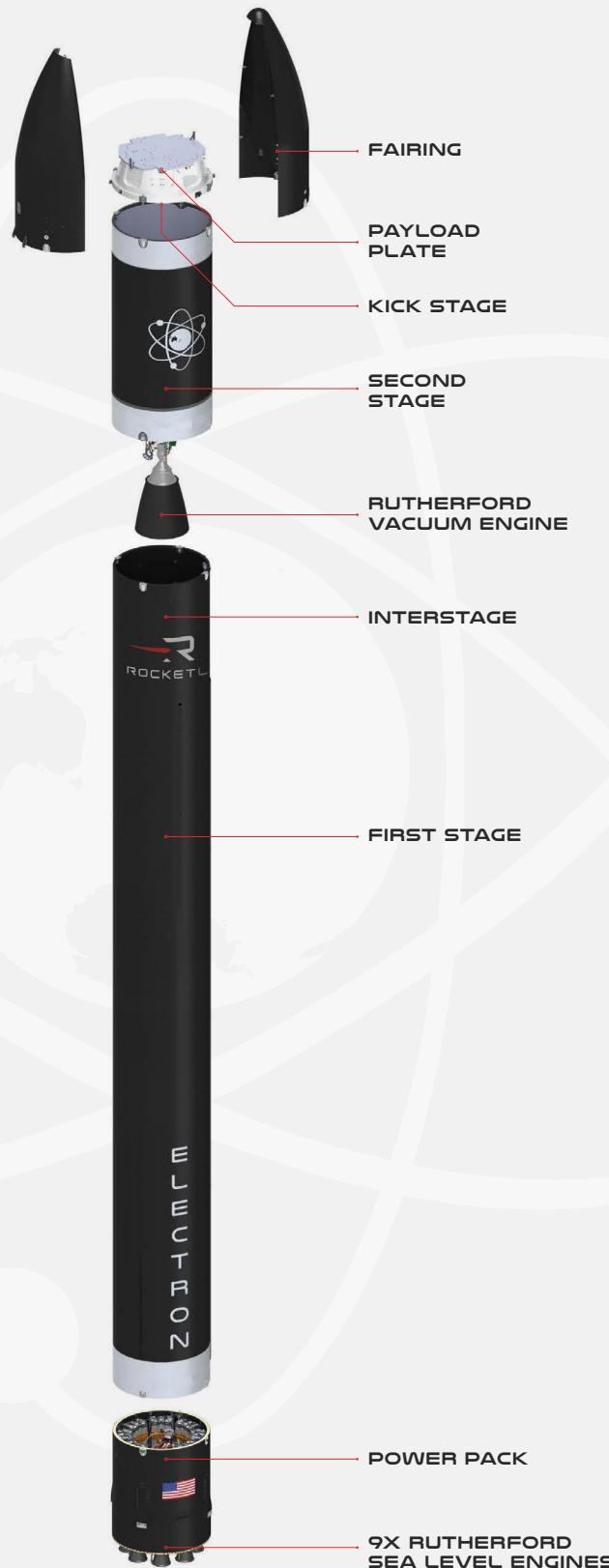
1.2m

### FAIRING HEIGHT

2.5m

### FAIRING SEP SYSTEM

Pneumatic Unlocking, Springs



## STAGE 2

### PROPULSION

1x Rutherford Vacuum Engine

### THRUST

5800 LBF Vacuum

### ISP

343 Sec

## INTERSTAGE

### SEPARATION SYSTEM

Pneumatic Pusher

## STAGE 1

### PROPULSION

9x Rutherford Sea Level Engines

### THRUST

5600 LBF Sea Level (Per Engine)

### ISP

311 Sec

## CONTACT US

- 🌐 [rocketlabusa.com](http://rocketlabusa.com)
- ✉️ [media@rocketlabusa.com](mailto:media@rocketlabusa.com)

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