

# BIRDS OF A FEATHER PRESS KIT JANUARY 2020

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LAUNCHING ON ELECTRON VEHICLE  
ELEVEN: **'BIRDS OF A FEATHER'**





# ROCKET LAB PRESS KIT

## 'BIRDS OF A FEATHER' 2020

### LAUNCH INFORMATION

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#### LAUNCH WINDOW

31 JANUARY – 13 FEBRUARY 2020 NZDT  
(31 JANUARY – 12 FEBRUARY 2019 UTC)

#### LAUNCH SITE

LAUNCH COMPLEX 1  
MAHIA PENINSULA, NZ

**Launch timing:** First launch opportunity no-earlier than 00:00 UTC (13:00 NZDT).

**Full launch window:** 00:00 - 04:00 UTC / 13:00 - 17:00 NZDT.

Watch the live launch webcast: [www.rocketlabusa.com/live-stream](http://www.rocketlabusa.com/live-stream).

For information on launch day visit [www.rocketlabusa.com/next-mission/](http://www.rocketlabusa.com/next-mission/) and follow Rocket Lab on Twitter [@RocketLab](https://twitter.com/RocketLab).



● LIFT OFF OF THE RUNNING OUT OF FINGERS MISSION | December 2019

### MISSION OVERVIEW

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Birds Of A Feather is a dedicated mission for the National Reconnaissance Office (NRO).

Headquartered in Chantilly, Virginia, the National Reconnaissance Office (NRO) develops and operates unique and innovative intelligence satellites to meet national security needs.

The NRO competitively awarded the contract under the Rapid Acquisition of a Small Rocket (RASR) contract vehicle, which allows the NRO to explore new launch opportunities that can provide a streamlined, commercial approach for getting small satellites into space.



● NRO'S NROL-151 MISSION PATCH



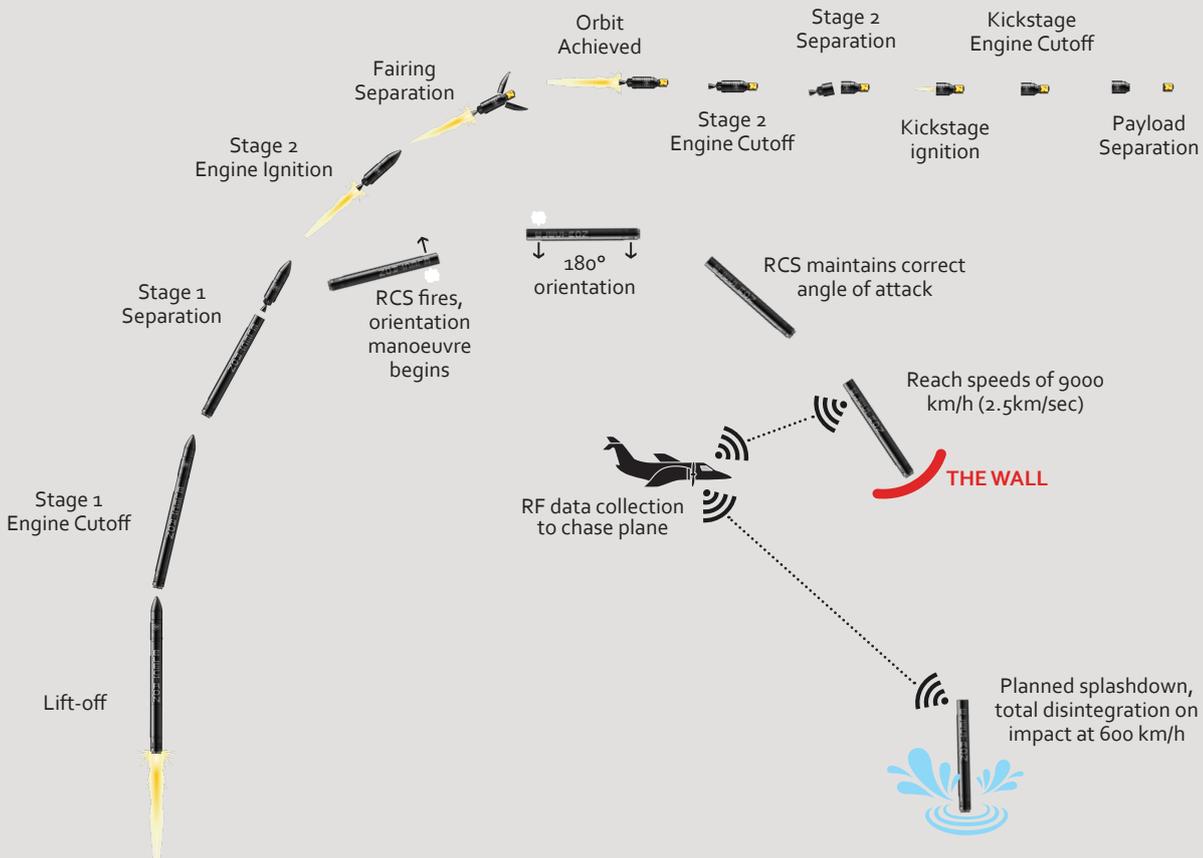
● ROCKET LAB'S BIRDS OF A FEATHER MISSION PATCH

For more than six decades, the NRO has answered the hardest national security-related questions with bold, innovative technology, and NROL-151 stands firm in this tradition. The NROL-151 mission logo is a light-hearted way to wish NROL-151 good fortune and launch on its mission.

# TIMELINE OF EVENTS

HOURS:MINUTES:SECONDS FROM LIFT-OFF

	EVENT
-06:00:00	Road to the launch site closed
-04:00:00	Electron lifted to vertical position and filled with fuel
-02:30:00	Launch pad personnel exit area in preparation for launch
-02:00:00	Electron filled with liquid oxygen (LOx)
-02:00:00	Safety zones are activated for designated marine space
-00:30:00	Safety zones are activated for designated airspace
-00:18:00	The Launch Director conducts a go/no-go poll of launch operators to confirm Electron is ready for launch
-00:02:00	Autosequence commences and Electron's on-board computers initiate the launch sequence
-00:00:02	Ignition of the nine Rutherford engines powering Electron's first stage
00:00:00	Lift-off
+00:02:37	Main Engine Cut Off (MECO) on the vehicle's first stage
+00:02:41	Stage 1 of Electron separates
+00:02:44	The vacuum Rutherford engine on Stage 2 ignites
+00:03:02	Stage 1 RCS orientation manoeuvre begins
+00:03:16	The Electron's fairing separates
+00:04:45	Stage 1 reaches apogee
+00:06:18	Battery hot-swap is performed
+00:06:30	Stage 1 orientation manoeuvre complete, Electron positioned at correct angle of attack for descent
+00:07:35	Stage 1 hits The Wall
+00:08:57	Electron reaches orbit
+00:09:05	Stage 2 separation from Kick Stage
+00:09:07	Stage 1 splashdown, total disintegration on impact
~+00:50:00	The Curie engine on the Kick Stage ignites for a final burn ahead of payload deployment







# REUSABLE ROCKETS

## LAUNCH FAST, LAUNCH OFTEN

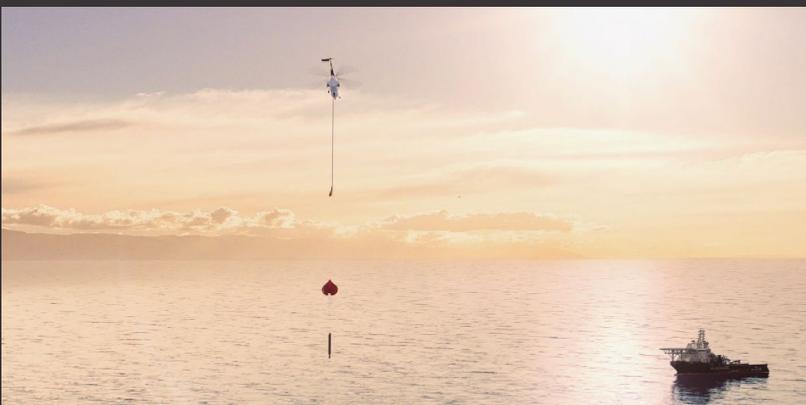
Rocket Lab's work to make Electron a reusable rocket continues at pace in 2020.

For this mission, we'll once again be attempting a guided re-entry of Electron's first stage through Earth's atmosphere – a successful manoeuvre we achieved during our most recent mission, *Running Out Of Fingers*, in December 2019.

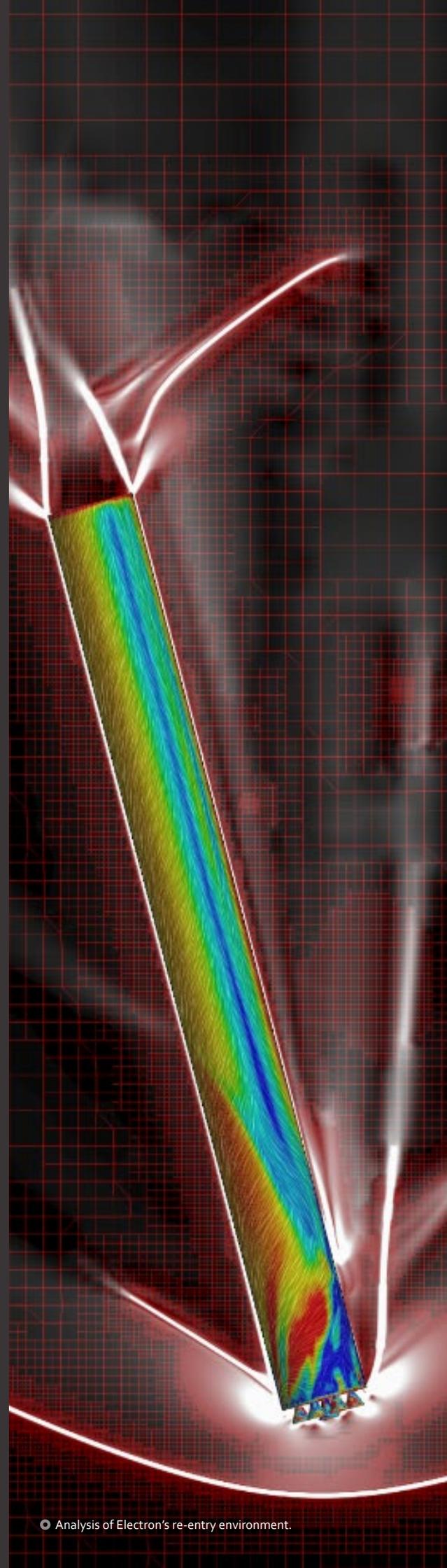
A reaction control system on the booster will orient the first stage 180-degrees during its atmospheric re-entry, to better enable it to survive incredible heat and pressure during its descent.

For this mission, a camera on stage 1 will attempt to document the re-entry view. This view will be available during the launch webcast, however a telemetry drop-out is expected at approx. 30km altitude, resulting in an anticipated loss of video.

Other aspects designed to support recovery efforts on this mission include updated guidance and navigation systems, including S-band telemetry and onboard flight computer systems, to gather and transmit data throughout the first stage's descent.



● Renders of Rocket Lab's stage 1 reuse and re-fly plan



● Analysis of Electron's re-entry environment.

# LAUNCH SITES



## LAUNCH COMPLEX 1

Birds Of A Feather will lift off from Rocket Lab Launch Complex 1 on New Zealand's Mahia Peninsula. Launch Complex 1 is the world's only private orbital launch range and close to 50 small satellites have been launched from the site since Rocket Lab began launching to orbit in January 2018.

Launch Complex 1 is licensed to launch every 72 hours and can accommodate up to 120 flights per year. With orbital inclinations from sun-synchronous through to 39 degrees within reach, and responsive launch capability on hand, Launch Complex 1 offers small satellites unprecedented access to space.

Initially opened in 2016 with a single pad and vehicle hangar, Launch Complex 1 has grown to include extensive range control operations and vehicle integration facilities equipped to process two Electron vehicles simultaneously. The site is also home to two 100K class cleanrooms for payload processing on site, each with dedicated and private customer facilities.

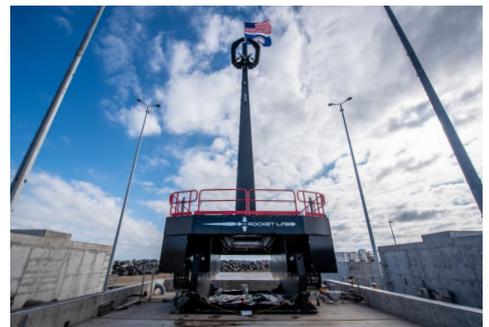
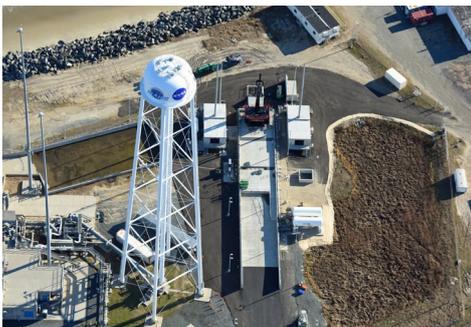
Construction is underway on a second launch pad at Launch Complex 1 to support rapid turnaround between launches. The pad, due for completion in late 2020, will be Rocket Lab's third pad following the completion of Launch Complex 2 in December 2019.



## LAUNCH COMPLEX 2

Located on Wallops Island, Virginia, Rocket Lab's Launch Complex 2 represents a new responsive launch capability for the United States on home soil. Tailored specifically for U.S. government small satellite missions, Launch Complex 2 can support up to 12 missions per year.

With more than 130 launch opportunities available across all three launch pads in both hemispheres, Rocket Lab customers enjoy incredible control over launch schedule and orbital requirements.





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