ROCKET LAB USA 2019

STP-27RD PRESS KIT
MAY 2019

LAUNCHING ON ELECTRON VEHICLE SIX:
'THATS A FUNNY LOOKING CACTUS'

ROCKET LAB

ROCKET LAB PRESS KIT
'STP-27RD' 2019

LAUNCH INFORMATION

LAUNCH WINDOW:
04 MAY - 17 MAY, 2019 NZST
(04 MAY - 17 MAY, 2019 UTC)

DAILY LAUNCH TIMING
1800 NZST / 0600 UTC
(4 HOUR DAILY WINDOW)

Watch the live launch webcast: www.rocketlabusa.com/live-stream.

For information on launch day visit
www.rocketlabusa.com/next-mission/launch-complex-1
and follow Rocket Lab on Twitter @RocketLab.

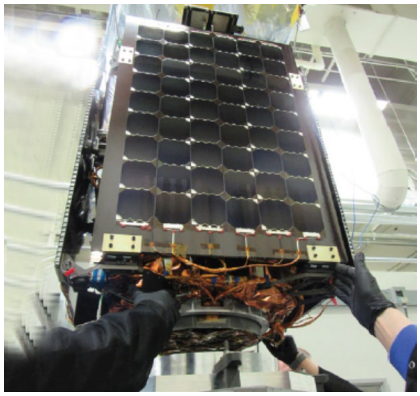
'R3D2' MISSION LIFTS OFF FROM ROCKET LAB LC-1
March 2019

STP-27RD PAYLOADS

TOTAL MISSION PAYLOAD MASS 180KG

The STP-27RD mission is Rocket Lab's fifth orbital mission and the company's second launch in 2019. The payload consists of three satellites, SPARC-1, Falcon ODE and Harbinger, that will deployed in a precise sequence.

The Space Plug and Play Architecture Research CubeSat-1 (SPARC-1) mission, sponsored by the Air Force Research Laboratory Space Vehicles Directorate (AFRL/RV), is a joint Swedish-United States experiment to explore technology developments in avionics miniaturization, software defined radio systems, and space situational awareness (SSA). The Falcon Orbital Debris Experiment (Falcon ODE), sponsored by the United States Air Force Academy, will evaluate ground-based tracking of space objects. Harbinger, a commercial small satellite built by York Space Systems and sponsored by the U.S Army, will demonstrate the ability of an experimental commercial system to meet DoD space capability requirements.



HARBINGER | March 2019

MISSION OVERVIEW

Weighing in at a total 180kg, the three satellites will lift-off on board an Electron rocket from Launch Complex 1 on New Zealand's Māhia Peninsula. They will be deployed to a circular orbit by Electron's Kick Stage, a nimble upper stage designed to insert payloads with precise accuracy before deorbiting itself and leaving no space junk behind.

ABOUT STP

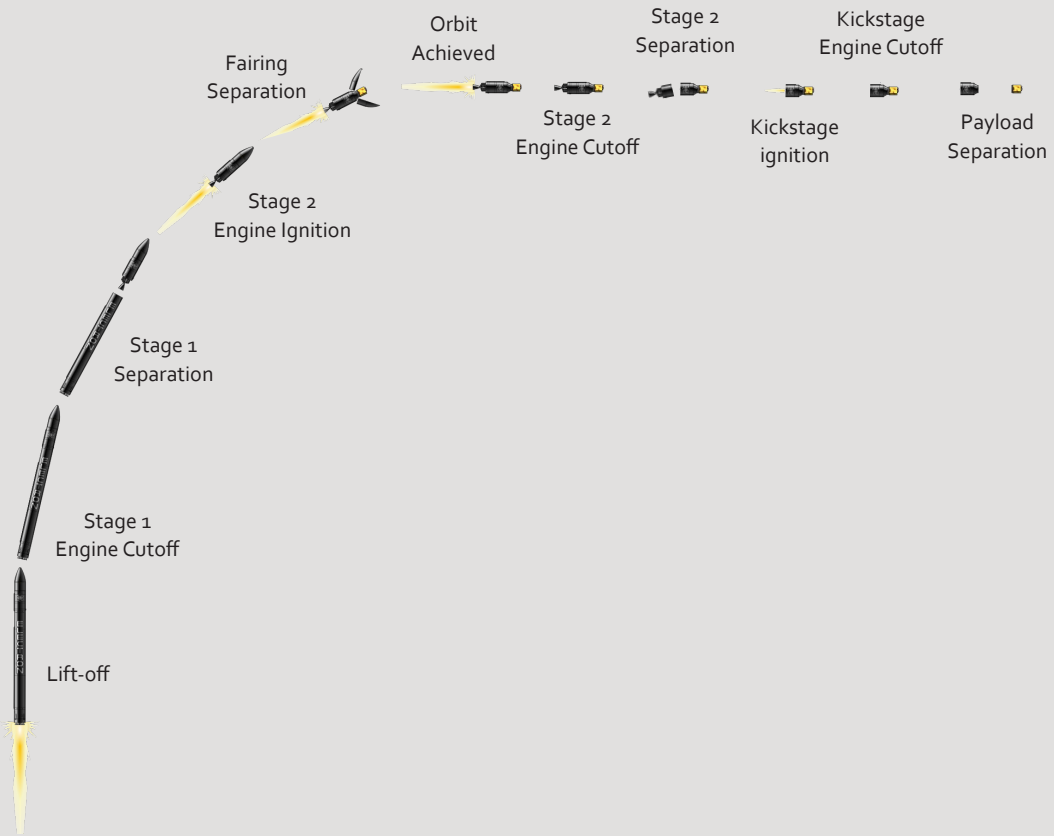
The Space Test Program (STP) is a US Government organization responsible for mission design, spacecraft acquisition, integration, launch, and on-orbit operations for the Department of Defense's most innovative space experiments, technologies and demonstrations. Many of the technologies crucial to the functioning of today's society began as risk reduction experiments with STP, including the Global Positioning System (GPS) and the climate monitoring Joint Polar Satellite System (JPSS). STP has enabled pathfinder missions that accelerate development of breakthrough technologies such as ionosphere monitoring, laser communications, solar storm warning systems, space debris tracking, solar sails and next-generation atomic clocks.

ENCAPSULATION OF THE STP-27RD PAYLOADS | April 2019

FAIRING GRAPHICS ON ELECTRON FOR THE STP-27RD MISSION | March 2019

TIMELINE OF EVENTS

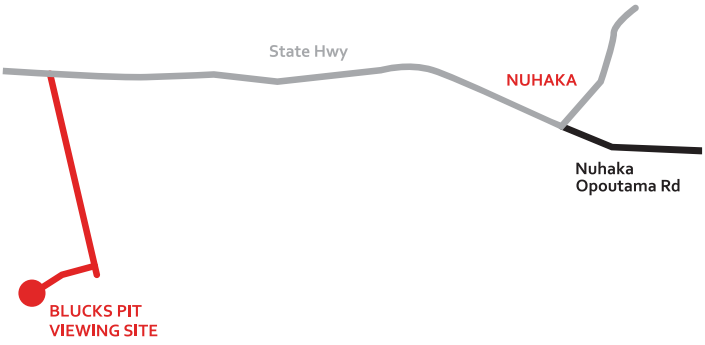
HOURS:MINUTES:SECONDS FROM LIFT-OFF	EVENT
	The team move the rocket from the hangar to the launch pad and assess weather conditions up to lift-off
-06:00:00	Road to the launch site closed
-04:00:00	Electron lifted to vertical position and filled with fuel
-02:30:00	Launch pad personnel exit area in preparation 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 – Electron climbs from the launch pad – initially rising slowly and increasing in speed as the Electron gets lighter
+00:02:31	Main engines (Stage 1) cut off
+00:02:34	Stage 1 of Electron separates
+00:02:37	The vacuum Rutherford engine on Stage 2 ignites
+00:03:08	The Electron's fairing separates
+00:08:51	Electron reaches orbit
+00:08:55	Stage 2 engine cuts off
+00:08:59	Stage 2 of Electron separates
+00:49:12	Kick Stage ignites
+00:51:55	Curie engine powering Kick Stage cuts off
+00:54:14	Payloads separated from launch vehicle



VIEWING A LAUNCH

VIEWING IN PERSON

Wairoa District Council has allocated a rocket launch viewing area for the public near Nuhaka, accessible via Blucks Pit Road. Visit www.visitwairoa.co.nz/welcome-to-wairoa/space-coast-new-zealand/ for more information. Scrubs and postponements are likely during launch windows, so visitors to the Blucks Pit viewing site should anticipate multiple postponements, sometimes across several days.



LC-1 LAUNCH VIEWING AREA | Blucks Pit Road, near Nuhaka

LAUNCH VIEWING AREA'S DISTANCE FROM ROCKET LAB LC-1

As Rocket Lab's top priority during the test launch is public safety, there are safety zones in place during a launch and no access will be permitted to Onenui Station where Launch Complex 1 is located.

LIVESTREAM

The best way to view a launch is via Rocket Lab's live video webcast. This offers the best views of launch and includes helpful commentary about the launch process. A livestream will be made available approximately 15 - 20 minutes prior to a launch attempt. Rocket Lab will post links to the webcast when live via Facebook and Twitter. The livestream is viewable at www.rocketlabusa.com/live-stream and Rocket Lab's YouTube channel.

ROCKET LAB'S LIVESTREAM OF 'R3D2' MISSION | March, 2019

LAUNCH FOOTAGE AND IMAGES

Images and video footage of the STP27-RD launch will be available shortly after a successful mission at www.rocketlabusa.com/news/updates/link-to-rocket-lab-imagery-and-video

Images and footage of previous Rocket Lab launches can also be found at that link.

SOCIAL MEDIA

For real time updates on the launch follow the Rocket Lab Twitter page @RocketLab

@RocketLabUSA @RocketLab

CONTACTS

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ABOUT ROCKET LAB

We open access to space to improve life on Earth

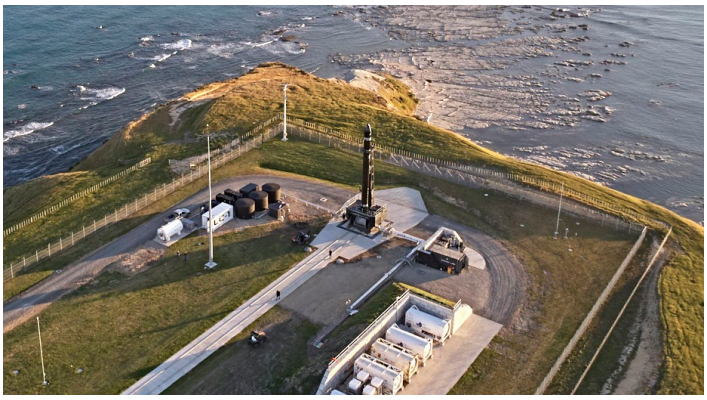
The wait is over. Frequent and reliable launch for small satellites is here with the Electron launch vehicle. With four orbital missions and 25 satellites launched to orbit since January 2018, Electron is the world's only operational private launch vehicle dedicated to small satellites. We're connecting the ideas of the future to space, and we're doing it now.

We are in an exciting new era of small satellite technology - one that's making life on Earth better. Small satellites keep us connected, provide security, help us monitor resources and environmental change, and they enable us to explore new and exciting science that benefits us all.

We believe getting these satellites to space should be simple, seamless and tailored to your mission - from idea to orbit.

Since the Electron launch vehicle was first conceived in 2013, every detail of the Rocket Lab launch experience has been designed to provide small satellites with rapid, reliable, and affordable access to space. Innovation is at the core of the Electron launch vehicle, just as it's at the core of the revolutionary small satellites we're launching to orbit. We've designed Electron to be built and launched with unprecedented frequency, while providing the smoothest ride and most precise deployment to orbit.

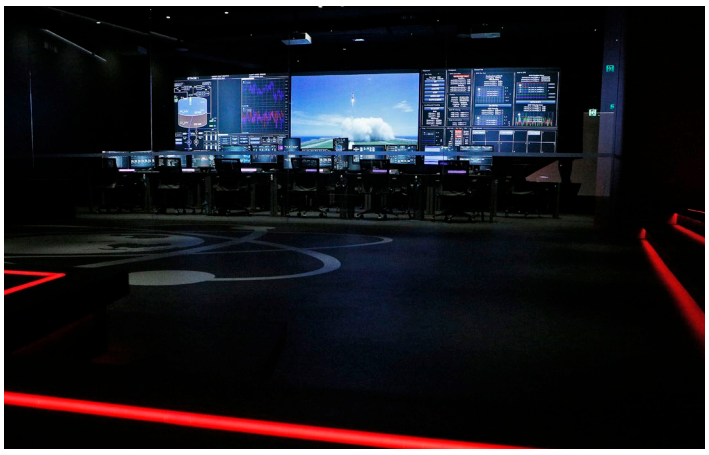
Led by founder and Chief Executive Peter Beck, Rocket Lab has grown to a global team of more than 400 highly-skilled engineers and technicians. Rocket Lab is a privately funded company. Investors include Khosla Ventures, DCVC (Data Collective), Bessemer Venture Partners, Future Fund, Greenspring Associates, ACC, K1W1, Promus Ventures and Lockheed Martin.



ELECTRON AT ROCKET LAB LAUNCH COMPLEX 1 | Māhia Peninsula, 2017

ABOUT LAUNCH COMPLEX-1

Electron is launched from Rocket Lab Launch Complex 1, the world's only private orbital launch range. Located in Māhia, New Zealand, and licensed to launch up to 120 times per year, Rocket Lab can accommodate an unprecedented launch cadence and reach orbital inclinations from sun-synchronous through to 39 degrees from a single site. Rocket Lab is also developing a second launch site to provide unmatched schedule and launch location freedom. Launch Complex 2 is being built at the Mid-Atlantic Regional Spaceport in Wallops Flight Facility, Virginia, USA.



ROCKET LAB MISSION CONTROL | October, 2018

LIFT OFF OF THE ELANA-19 MISSION FOR NASA FROM ROCKET LAB LAUNCH COMPLEX 1 | December, 2018 | Image credit: Trevor Mahlmann

ABOUT RUTHERFORD ENGINE

Rutherford is a state of the art oxygen and kerosene pump fed engine specifically designed from scratch for Electron, using an entirely new propulsion cycle. A unique feature of Rutherford is the high-performance electric propellant pumps which reduce mass and replace hardware with software.

Rutherford is the first engine of its kind to use 3D printing for all primary components. These features are world firsts for a high-performance liquid rocket engine with propellants that are fed by electric turbopumps. The production-focused design allows Electron launch vehicles to be built and satellites launched at an unprecedented frequency.

RUTHERFORD ENGINE TEST | New Zealand, 2016

> RUTHERFORD IS A STATE OF THE ART OXYGEN AND KEROSENE PUMP FED ENGINE SPECIFICALLY DESIGNED FROM SCRATCH FOR ELECTRON, USING AN ENTIRELY NEW PROPULSION CYCLE.

ELECTRON

NOMINAL PAYLOAD
150KG

STAGES
2

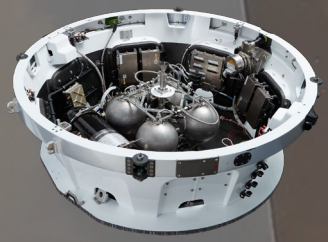
HEIGHT
18M

NOMINAL SUN-SYNC. ORBIT
500KM

DIAMETER
1.2M

DEDICATED
Electron can deliver your payload when and where required.

RIDESHARE
Fly with other payloads at commercially competitive prices.



OPTIONAL KICK STAGE
Rocket Lab's apogee kick stage can execute multiple burns to place numerous payloads into different, circularized orbits. It opens up significantly more orbital options, particularly for rideshare customers that have traditionally been limited to the primary payload's designated orbit. Powered by Rocket Lab's 3D printed liquid propellant Curie engine, the kick stage is capable of 120N of thrust and multiple burns.

Electron is an entirely carbon-composite vehicle powered by Rocket Lab's 3D-printed, electric turbo-pump fed Rutherford engines. Electron is capable of delivering payloads of up to 150 kg to a 500 km sun-synchronous orbit – the target range for the high growth constellation-satellite market. Customers signed to fly on Electron include NASA, Spaceflight, Planet, Spire and Moon Express.

THE ROCKET LAB KICK STAGE

RESPONSIBLE ORBITAL DEPLOYMENT

As the small satellite industry experiences rapid growth, we're determined to be part of the solution for sustainability and the reduction of orbital debris in space. Traditional methods of deploying satellites can leave large rocket stages in orbit, contributing to the global issue of space junk. We know there's a better way.

The Rocket Lab Kick Stage is designed to deliver small satellites to precise orbits, before deorbiting itself to leave no part of the rocket in space.

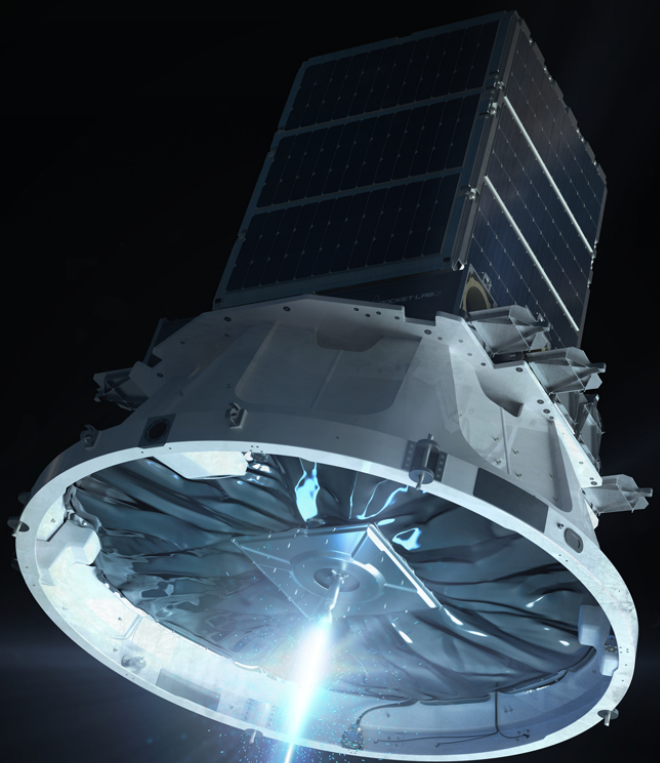
Powered by the Curie engine, named after physicist and chemist Marie Curie, the Kick Stage is a nimble but powerful extra stage on Electron designed to circularize payload orbits. It employs a cold gas reaction control system to precisely point itself and deploy satellites to independent yet highly precise orbits, and also eliminate the risk of recontact with other spacecraft during deployment.

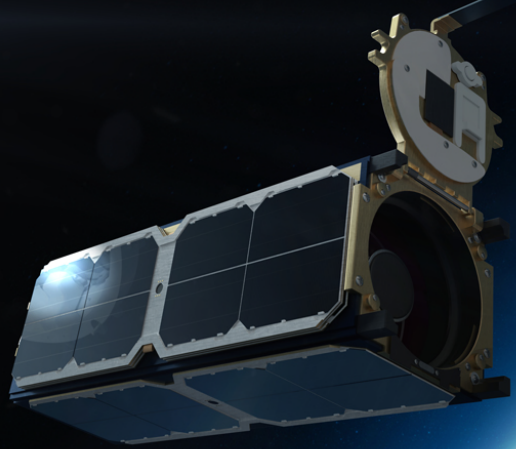
After all payloads are deployed, the Kick Stage can reorient itself and reignite the Curie engine one last time to perform a deorbit maneuver. This drastically lowers the Kick Stage's orbit, enabling it to re-enter the atmosphere and burn up without a trace.

'ELANA-19' PAYLOAD INTEGRATION ON THE KICK STAGE | 2018

> BY DOING THIS WE LEAVE NOTHING IN ORBIT BUT OUR CUSTOMERS' SATELLITES - THE WAY IT SHOULD BE.

PAYLOADS ON THE KICK STAGE ON MISSION 'ITS BUSINESS TIME' | Space, 2018





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