

ROCKET LAB USA 2019

DARPA R3D2 PRESS KIT MARCH 2019





ROCKET LAB PRESS KIT 'DARPA R3D2' 2019



● **ROLL OUT IN PREPARATION FOR R3D2 MISSION AT LC-1** | February 2019



● **ELECTRON 'R3D2' SUCCESSFUL WET DRESS REHEARSAL** | February 2019

ABOUT DARPA

DARPA (Defense Advanced Research Projects Agency) is a US Government organisation and an innovation icon. DARPA has created many breakthrough technologies that have had sweeping societal and economic impacts, including portable GPS receivers, new types of computer chips, voice-recognition software, interactive and personal computers, and, most famously, the ARPANET and its successor, the internet. Current DARPA research also may have dramatic future impacts, including self-driving vehicles, robots and exoskeletons, and cognitive computing - computers that emulate brain-like processing.



● **ELECTRON FAIRING FOR DARPA 'R3D2' MISSION** | January 2019



● **SUCCESSFUL STAGE ONE STACK TEST FOR 'R3D2' MISSION** | January 2019



ROCKET LAB PRESS KIT 'DARPA R3D2' 2019

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 three orbital missions and 24 satellites launched to orbit in 2018 alone, 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.

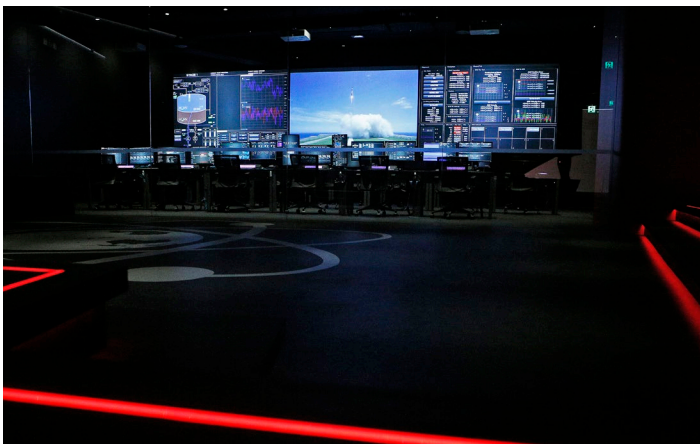
Led by founder and Chief Executive Peter Beck, Rocket Lab has grown to a global team of more than 400 highly-skilled engineers and technicians. Rocket Lab is a privately funded company. Investors include Khosla Ventures, DCVC (Data Collective), Bessemer Venture Partners, Future Fund, Greenspring Associates,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



● ELECTRONS RUTHERFORD ENGINES DURING LIFT OFF OF THE ELANA-19 MISSION | December, 2018 | Image credit: Brady Kenniston

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.

E
L
E
C
T
R
O
N

NOMINAL PAYLOAD
150KG

STAGES
2

HEIGHT
18M

NOMINAL SUN-SYNC. ORBIT
500KM

DIAMETER
1.2M



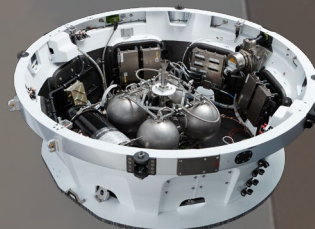
DEDICATED

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.

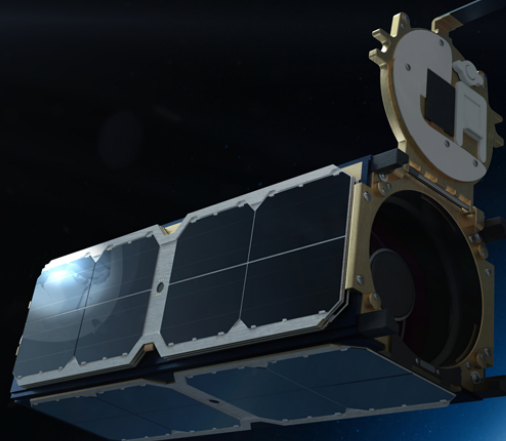
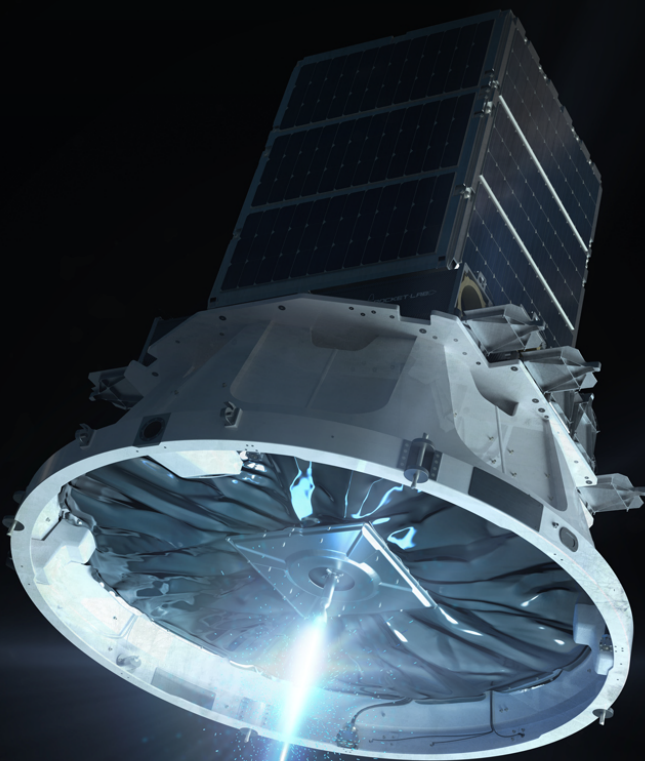


◉ 'ELANA-19' PAYLOAD INTEGRATION ON THE KICK STAGE | 2018

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





CONTACT US

[rocketlabusa.com](https://www.rocketlabusa.com)
[+64 9 373 2721](tel:+6493732721)
enquires@rocketlabusa.com

CONNECT WITH US

[@rocketlab](https://twitter.com/rocketlab)
[RocketLabUSA](https://www.instagram.com/RocketLabUSA)
[facebook.com/rocketlabusa](https://www.facebook.com/rocketlabusa)