



DASHING THROUGH THE STARS

MISSION BOOKLET



Mission name: Dashing Through the Stars
Carrier name: ION SCV004 Elysian Eleonora

ION Satellite Carrier, D-Orbit's Orbital Transportation Vehicle, was launched aboard a Falcon 9 rocket. SpaceX's Transporter-3 mission on January 13th at 15:25 UTC (10:25 a.m. EST) from the Space Launch Complex 40 (SLC-40) at Cape Canaveral Space Force Station (CCSFS), Florida. On the same day, 1 hour 24 minutes 30 seconds minutes after liftoff, the ION vehicle was successfully deployed into a 500 km Sun synchronous orbit (SSO).

ION Satellite Carrier is an OTV designed, manufactured, and operated by D-Orbit to transport satellites into orbit and release them individually into distinct and precise orbital slots in the shortest time possible. ION can also host multiple third-party payloads such as innovative technologies, experiments from research entities, and instruments requiring testing in orbit.

During this mission, dubbed "DASHING THROUGH THE STARS," ION will deploy customer spacecraft, perform the in-orbit demonstration of third-party payloads, and validate several innovative features that will be available to customers on future missions.

After completion of the usual Launch and Early Orbit phase (LEOP) operations, ION has begun its primary mission, deploying the customer's satellites. This mission's manifest includes clients from around the world like Lockheed Martin, with a satellite developed in collaboration with the University of Southern California Space Engineering Research Center for the testing of complex vision processing algorithms, SatRevolution, with a group of satellites for Earth Observation and scientific purposes, and the Czech Aerospace Research Centre (VZLU) in cooperation with Spacemanic, with a satellite testing technologies for future missions of the Czech satellite constellation.

Once the deployment phase is completed, ION will begin the on-orbit testing of third-party payloads, including the second phase of testing of D-Orbit's cloud platform designed to provide distributed high-performance data analytics computing and storage capabilities in space. For this mission, D-Orbit is working in collaboration with Unibap and the European Space Agency (ESA) who are supporting the in-orbit test of a hyperspectral electro-optical instrument developed by research institution VTT. This platform allows third parties to upload and execute cloud applications and AI workloads to process images as soon as they are created, allowing results to be sent to users in record time. The first test campaign, which took place during ION's previous mission, successfully executed 23 separate SpaceCloud compatible applications from a variety of partners.

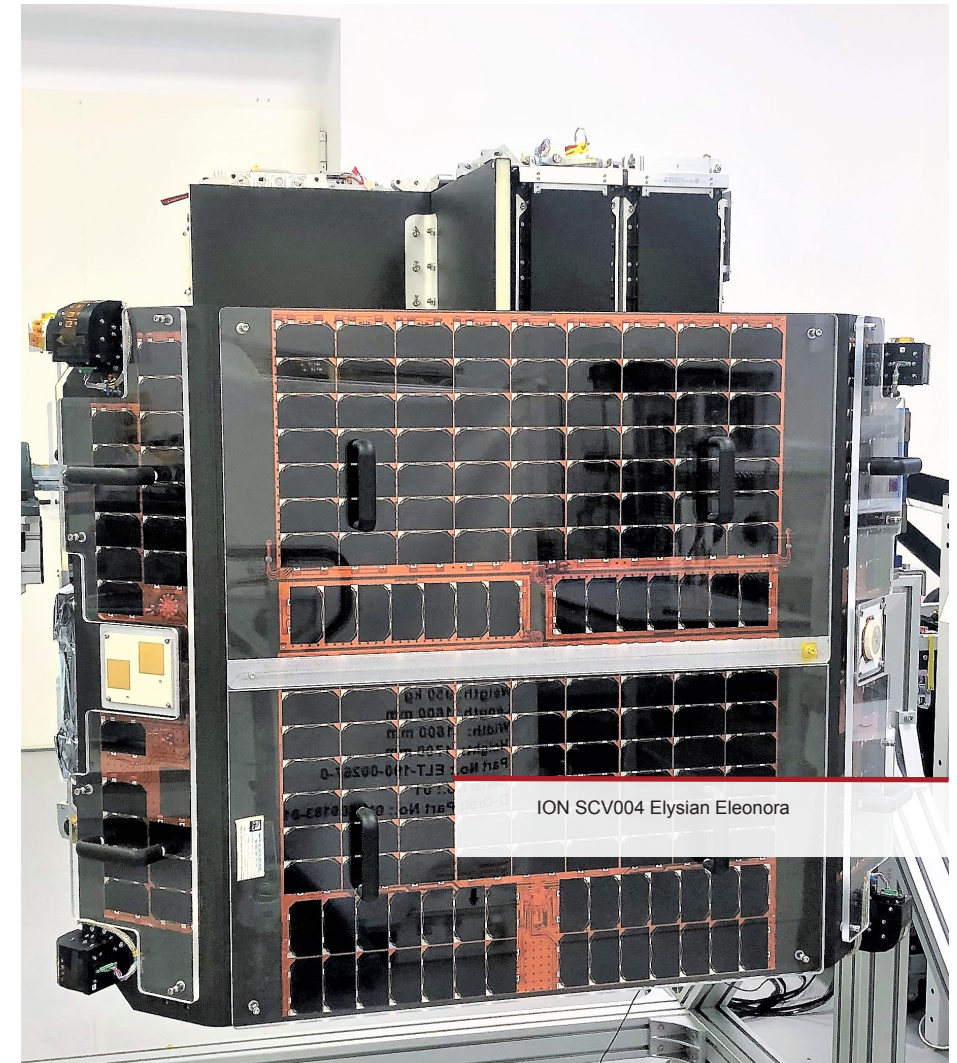
This on-orbit testing phase of the mission will also include the validation of ARCA Space by CYSEC SA, a hardened operating system with a built-in cryptographic service and key management system to provide end-to-end cyber security protection for satellite communications.

The mission, including operations on payloads, will be managed by D-Orbit's mission controllers through Aurora, the company's proprietary cloud-based mission control software suite that enables satellite operators to manage and control multiple payloads simultaneously, from any location in the world, without having to invest in their own saving all the expenses connected with software design, development, testing, deployment, and maintenance.

D-Orbit launched its first ION in September 2020 aboard an Arianespace VEGA launcher, followed by two further missions flown in January 2021 and June 2021 aboard SpaceX's Transporter-1 and Transporter-2 missions respectively. With this mission, the fourth in less than 15 months, the Company will have launched to space collectively more than 70 payloads.

A note about the name of the satellite carrier

The name of the satellite carrier is "ION SCV004 Elysian Eleonora", a combination of the acronym "ION", which stands for "InOrbit NOW", the acronym "SCV," which stands for "Space Carrier Vessel," and the satellite's first name. This format follows the naming conventions of naval vessels used in navies around the World. The name "Eleonora" was drawn at random from a bowl containing the names of all D-Orbit's employees. The company will continue to follow this procedure in the future to honor the skills, energy, passion, and commitment of its people.





Payload: DODONA

Form factor: 3U

POC: Erik Carlson
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Dodona, a 3U CubeSat developed by the University of Southern California in partnership with Lockheed Martin, is carrying the company's software-defined La Jument payload which will help space qualify a number of Artificial Intelligence (AI) and Machine Learning (ML) technologies.

In particular, on orbit, the La Jument payload will demonstrate how Lockheed Martin's SmartSat™ software-defined satellite architecture can control a low-cost camera and perform onboard SuperRes™ upscale processing of collected image data of the Earth's surface. SmartSat™ allows users to expand satellite capabilities and change missions on orbit.

COMPANY PROFILE

Website: www.lockheedmartin.com

Headquartered in Bethesda, Maryland, Lockheed Martin is a global security and aerospace company that employs approximately 114,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.

Photo credits: University of Southern California



Payloads: Stork-1, Stork-2, Labsat, SW1FT

Form factor: 3U

POC: Ula Wisniewska
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STORK: STORK is a CubeSat constellation for earth observation and technology testing built and operated by SatRevolution. Based on the state-of-the-art 3U UniBus platform, the STORK 3U CubeSats features SatRevolutions' Vision-300 imager with a ground resolution of up to 5m for collecting multispectral medium-resolution imagery and data for agricultural and energy customers.

Labsat: LabSat is the result of a project focusing on miniaturized laboratory tools and technologies for testing in microgravity conditions. The 3U CubeSat consists of a CubeSat bus, created by SatRevolution, and scientific payloads developed by four Wroclaw based universities, spearheaded by Wroclaw University of Science and Technology.

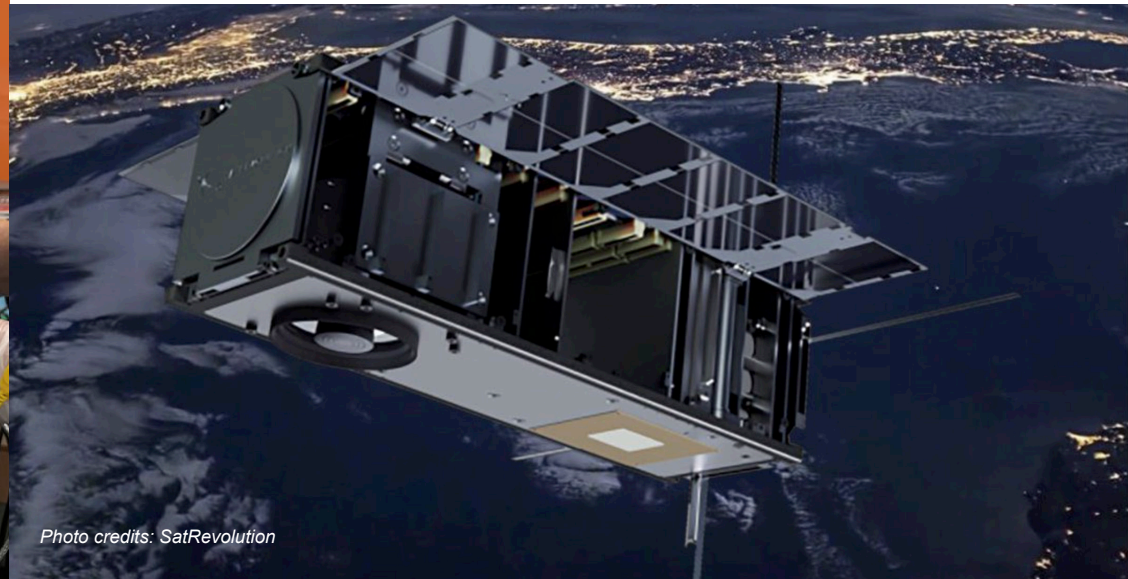
SW1FT: will be carrying an optical payload capable of capturing RGB and NIR images at 5m resolution, as well as a Space Edge Zero payload from Spiral Blue, an on-board computer for an on-board image processing experiment and a mini actuator experimental deployment subsystem from DcubeD (known as Space Selfie Stick)

COMPANY PROFILE

Website: www.satrevolution.com/

SatRevolution is a new space company based in Wroclaw, Poland, offering complete nanosatellite systems and solutions. Founded in 2016 with the idea to build and launch first Earth-observation constellation in Poland, SatRevolution has recently been co-funded by European Regional Development Fund for the first stage of the constellation. The company specializes in cubesat and microsat platforms and services, with two satellites already in orbit and a number of customer projects well on the way.

Photo credits: SatRevolution





Payloads: VZLUSAT-2

Form factor: 3U

POC: Daniela Jovic
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VZLUSAT-2 is a 3U CubeSat mission of the Czech Aerospace Research Centre. The primary payload of this satellite is an experimental Earth Observation camera system with a resolution of 50-100 m GSD. The platform also contains several other experimental and scientific payloads: Gamma Flash Detector (GRB Detector), Space Dosimetry System Demonstrator (2SD), Water vapour outgassing (DPTWI) sensor, X-ray optical payload and Space X-ray Detector (SXD). The satellite is equipped with an experimental ADCS unit for precision orientation control of the satellite. Satellite communication with telemetry and telecommand is performed by UHF band in the amateur frequency band. Mission operation will be provided by a team from the University of West Bohemia.

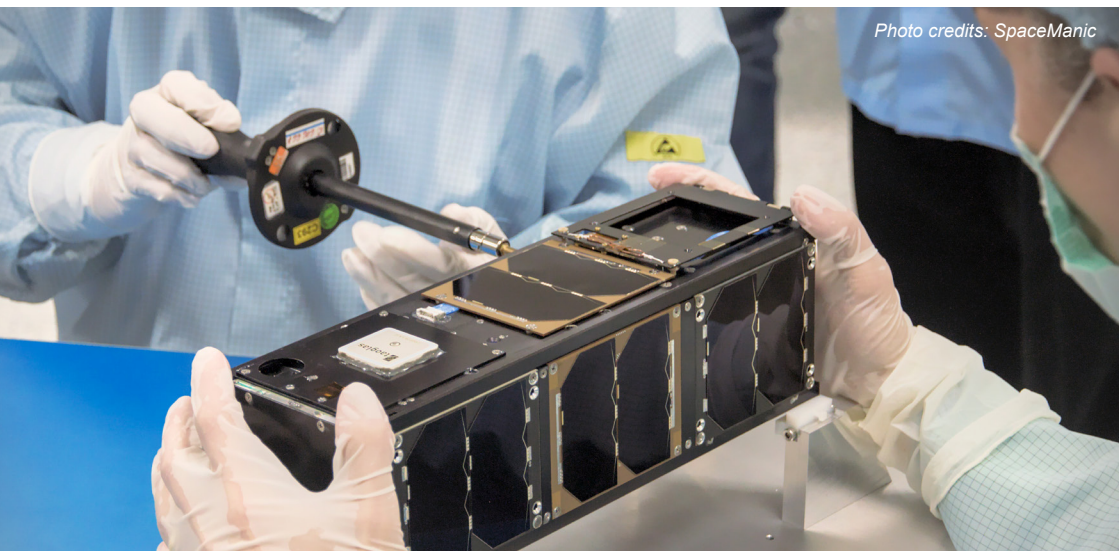
COMPANY PROFILE

Website: www.spacemanic.com; www.vzlu.cz

VZLU: Czech Aerospace Research Centre (VZLU) is the national centre for research, development, innovations, and testing for aerospace industry. VZLU's mission is to build knowledge and solutions in the field of aeronautical and space technologies, thus contributing to expansion of knowledge and competitiveness in the aerospace industry. VZLU's vision is to become an internationally respected research and development centre and national technological leader in the aerospace industry.

SPACEMANIC is a small satellite mission integrator, focused on delivering flight proven innovative and reliable nanosatellite solutions, platforms, components, and services. The company is very strong in the field of design, development and testing of fundamental small satellite components, such as an onboard computer, power systems units and solar panels.

Photo credits: SpaceManic



Artistic representation on ION Satellite Carrier in orbit. Background picture taken with D-Orbit's multi-sensor module D-Sense during the Dashing Through The Stars mission.



Payload: Cloud platform

Hosted payload

POC: Caterina Cazzola
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D-Orbit's cloud platform is designed to provide distributed high-performance data analytics computing and storage capabilities in space. For this mission, D-Orbit is working in collaboration with Unibap and the European Space Agency (ESA) who are supporting the in-orbit test of a hyperspectral electro-optical instrument developed by research institution VTT. This platform allows third parties to upload and execute cloud applications and AI workloads to process images as soon as they are created, allowing results to be sent to users in record time.

COMPANY PROFILE - D-ORBIT Website: www.dorbit.space

D-Orbit is a market leader in the space logistics and transportation services industry with a track record of space-proven technologies and successful missions. The company is a space infrastructure pioneer with offices in Italy, Portugal, UK, and the US; its commitment to pursuing business models that are profitable, friendly for the environment, and socially beneficial, led to D-Orbit becoming the first certified B-Corp space company in the world.

COMPANY PROFILE - UNIBAP Website: www.unibap.com/en

Unibap is a high-tech company that aims to automate and streamline industries on earth as well as in space. With smart solutions based on AI and robotics, we want to increase quality and productivity for our customers while eliminating dangerous tasks that today are performed manually. Unibap strives to have a positive impact on both society and the environment. The company's Quality Management System is certified according to SS-EN ISO 9001:2015. The company is listed at Nasdaq First North Growth Market.

COMPANY PROFILE - VTT Website: www.vttresearch.com/en

VTT is one of Europe's leading research institutions. We are owned by the Finnish state. We advance the utilisation and commercialisation of research and technology in commerce and society. Through scientific and technological means, we turn large global challenges into sustainable growth for businesses and society. We bring together people, business, science and technology to solve the biggest challenges of our time. This is how we create sustainable growth, jobs and wellbeing and bring exponential hope.

ORGANIZATION PROFILE - EUROPEAN SPACE AGENCY Website: www.esa.int

ESA will be testing several applications, including robust compression of health data headers according to the upcoming standard CCSDS 124, and two scientific oriented applications (i.e radiation particle detection application, and a solar activity analysis application).



Payloads: VZLUSAT-2

Hosted Payload

POC: Nikoleta Guetcheva
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A comprehensive solution to secure the entire satellite communications ecosystem thanks to dedicated products for ground-based and in-orbit assets and data. CYSEC ARCA Space products are based on the CYSEC proprietary technology CYSEC ARCA, a confidential computing environment ensuring the protection of data in its three states: at rest, in transit and in use.

CYSEC ARCA on ground is a hardware-based Trusted Execution Environment (TEE) to host mission critical applications and data on premises or in the cloud. The flight version, CYSEC ARCA Embedded, comes in the form of an innovative On-Board Computer (OBC). Together they provide an end-to-end, accessible and reliable security solution for commercial space missions.

CYSEC ARCA Space allows commercial space companies to innovate securely with the data that they collect and transmit with end-to-end security.

COMPANY PROFILE Website: www.cysec.com

CYSEC SA is a data security company based at the EPFL Innovation Park in Lausanne, Switzerland. CYSEC brings 360° security in one click for container-based workloads and platforms through its CYSEC ARCA trusted OS software. CYSEC partners with leading cybersecurity research centers to develop technological innovations in the area of Confidential Computing and delivers its cybersecurity solutions for any vertical sector.



Photo credits: Cysec

