



REVOLUTIONISING EARTH OBSERVATION SATELLITES



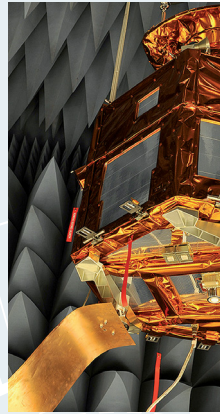
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 737183.

OUR OBJECTIVES

The vision of the DISCOVERER project is a **radical redesign of Earth observation satellites** for sustained **operation at much lower altitudes** than the current state of the art.

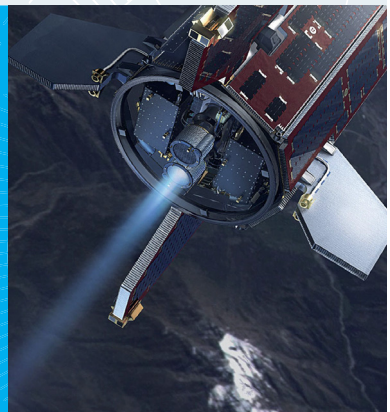
We want to achieve this by using a combination of new aerodynamic materials, aerodynamic control and **atmosphere-breathing electric propulsion** for drag-compensation.

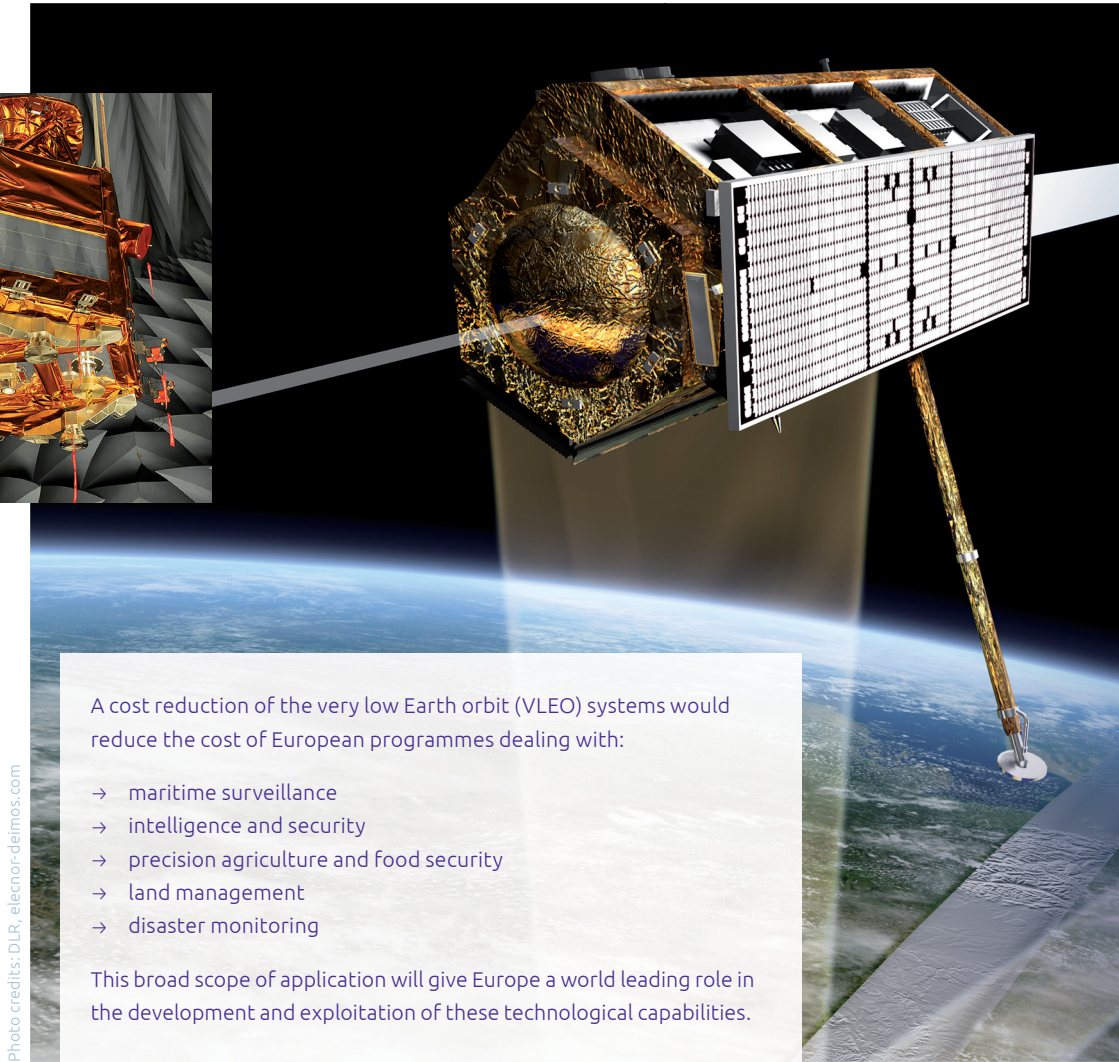
These next generation satellites would be **smaller, less massive and less expensive to launch**, but would still achieve the same or even better resolution and data products than today's platforms.



DISCOVERER aims to develop the key technologies required to master the engineering challenges of this cutting-edge project. This requires foundational research in the following areas:

- spacecraft aerodynamic characterization
- material aerodynamics and atomic oxygen resistance
- electric propulsion and control methods





A cost reduction of the very low Earth orbit (VLEO) systems would reduce the cost of European programmes dealing with:

- maritime surveillance
- intelligence and security
- precision agriculture and food security
- land management
- disaster monitoring

This broad scope of application will give Europe a world leading role in the development and exploitation of these technological capabilities.

WHY OUR RESEARCH MATTERS

Few vehicles operate in the altitude range between the highest reconnaissance aircraft at 26 km (highest sustained SR71 flight) and the lowest space platforms at around 450 km, except for relatively short durations or with frequent resupply. Yet, for remote sensing, very low orbits offer considerable advantages over conventional space platforms whilst maintaining global coverage, and without the inherent constraints on aircraft of airspace restrictions and limited range and duration.

Therefore, the potential impact of the breakthroughs the DISCOVERER project is aiming for is paradigm changing, equivalent to the impact the invention of the jet engine had on the aeronautical sector in the 1940s. The proposed **development of low-drag materials** and satellite geometries, along with the development of propulsion that enables sustained continuous flight at much lower velocities, both open up a whole **new flight regime for spacecraft** and hold the promise of radically changing the sector.

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MEMBERS

DISCOVERER is an international research project that brings together 9 transdisciplinary institutions from 6 different countries:

- THE UNIVERSITY OF MANCHESTER
Manchester, United Kingdom
- DEIMOS CASTILLA LA MANCHA SL
Puertollano, Spain

- GOMSPACE APS
Aalborg, Denmark

- INSTITUTE OF SPACE SYSTEMS (IRS),
UNIVERSITY OF STUTTGART
Stuttgart, Germany

- UNIVERSITAT POLITECNICA DE CATALUNYA
Barcelona, Spain

- UNIVERSITY COLLEGE LONDON
London, United Kingdom

- THE TECH TOYBOX, INC.
Gainesville, FL, United States

- EUROCONSULT SA
Paris, France

- CONCENTRIS RESEARCH MANAGEMENT GMBH
Fürstenfeldbruck, Germany



THE DISCOVERER PROJECT IN A NUTSHELL

FULL PROJECT TITLE	Disruptive Technologies for Very Low Earth Orbit Platforms
START DATE	01.01.2017
DURATION TIME	51 months
PARTICIPANTS	9 institutions from 6 different countries
EC FUNDING	€ 5,726,750
PROJECT WEBSITE	www.discoverer.space

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