

About PROBA-1

What

ESA's first small satellite, **PROBA-1 (Project for On Board Autonomy)**, was launched with just one goal – to prove technologies in space. Intended to survive only two years, it exceeded all expectations

When

Launched on
22 OCT 2001

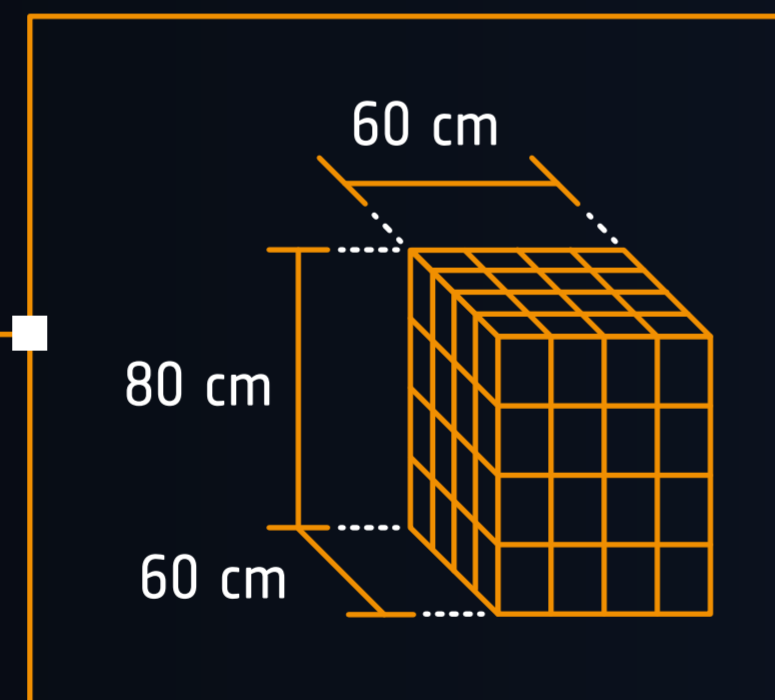
Launched on 22 October 2001, from Sriharikota, India

Where

The micro-satellite was built by an industrial consortium with prime contractor QinetiQ Space nv (formerly Verhaert, Belgium) with support from ESA's General Support Technology Programme

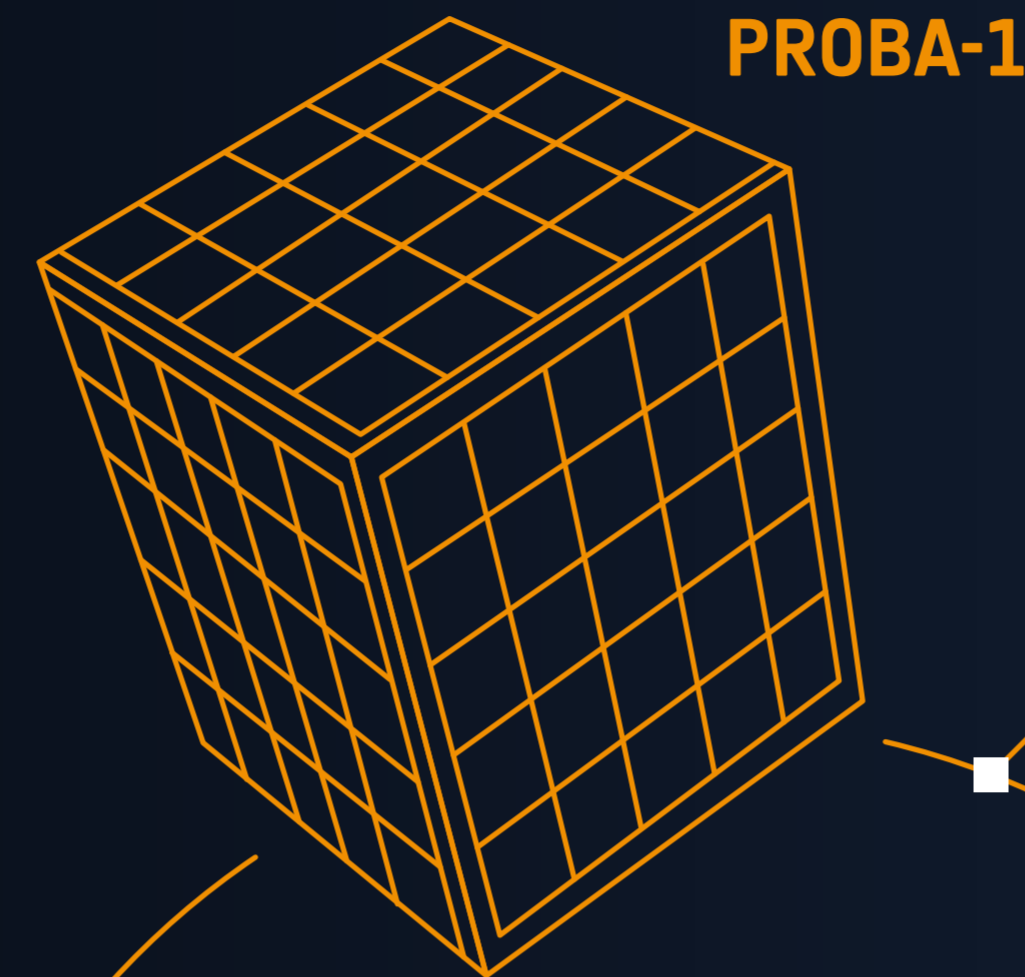
Objectives

Measuring just 60 x 60 x 80 cm, PROBA-1 autonomously performs advanced guidance, navigation and control processing, as well as payload resources management



Instruments

Its two EO imaging instruments – the **Compact High Resolution Imaging Spectrometer (CHRIS)** and the panchromatic **High Resolution Camera (HRC)** – have provided more than 82000 and some 37800 images, respectively. Weighing just 14 kg, **CHRIS was the smallest hyperspectral imager ever flown in space** and can see down to a resolution of 17 metres, acquiring up to five multi-angle images of each target from a single overpass, with up to 62 spectral channels



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Benefits

The mission's original objectives included testing autonomous systems, which have since been used in other missions. With some 945 unique science sites targeted by the CHRIS instrument over the mission lifetime, managed by 276 scientific teams from over 60 countries worldwide, PROBA-1 has supported environmental studies for the monitoring of forests, urban areas, glaciers, water bodies, agriculture and much more. CHRIS' multi-angle capability has supported the advancement of atmospheric correction techniques and understanding of the directionality of Earth's spectral reflectance

Novelty

ESA's first venture into small missions, PROBA-1 marked a pivot towards such missions in the European space industry. It was developed in just three years – an unheard-of feat at the time, when space agency missions often took more than 10 years to develop and launch. The satellite was the first to use a lithium-ion battery (now a ubiquitous technology), and the first ESA spacecraft with fully autonomous capabilities. In 2018, it became the record holder as the longest ever running ESA Earth Observation satellite. In 2020, it passed the milestone of 100,000 orbital revolutions of Earth

Data and users

Current users of the PROBA-1 satellite include: more than 61 Earth Observation Principal Investigators from scientific institutes; space weather and space debris scientific communities; EduProba (Belgian schools and universities). PROBA-1 data are being delivered through ESA's Third Party Missions programme on a free basis, to a range of stakeholders, supporting cutting-edge science. The data are sent to a webserver located at ESA's ground station in Redu, Belgium, where scientists are able to access the information over the Internet once it is delivered from the satellite and processed

Compact High Resolution Imaging Spectrometer CHRIS

- 14 kg
- 82000
- 17 m

Data Access: earth.esa.int/eogateway/missions/proba-1/data