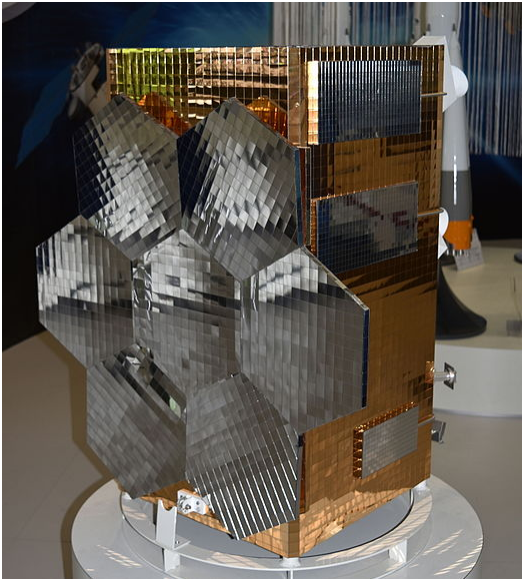


Mikhailo Lomonosov (satellite)

Mikhailo topan(MVL-300)



A model of the Mikhailo Lomonosov

Mission type	Astronomy
Operator	MSU
COSPAR ID	2016-026A (https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=2016-026A)
SATCAT no.	41464
Website	lomonosov.sinp.msu.ru (http://lomonosov.sinp.msu.ru/en/)
Mission duration	Planned: 3 years ^[1]
Spacecraft properties	
Manufacturer	VNIIEM
Launch mass	620 kg (1,370 lb)^[1]
Payload mass	170 kg (370 lb)^[1]
Power	~300 W^[1]
Start of mission	
Launch date	28 April 2016, 02:01 UTC
Rocket	Soyuz-2.1a/Volga
Launch site	Vostochny Site 1S
Contractor	Roscosmos
End of mission	
Deactivated	14 January 2019

Orbital parameters	
Reference system	Geocentric
Regime	Sun-synchronous
Semi-major axis	6,856 kilometers (4,260 mi) ^[2]
Perigee altitude	478.2 km (297.1 mi) ^[2]
Apogee altitude	492.9 km (306.3 mi) ^[2]
Inclination	97.3 degrees ^[2]
Period	94.2 minutes ^[2]
Instruments [show]	
TUS	Orbital ultraviolet telescope (300–400 nm)
BDRG	X-ray and gamma radiation detector
UFFO	UV-optic telescope and x-ray camera
ShOK	Wide-angle optical cameras
DEPRON	Electron, proton, and neutron dosimeter
ELFIN-L	Charged particles detector ^[3]
IMISS-1	Microelectromechanical inertial measuring
BI	Information unit

Mikhailo Lomonosov (**MVL-300**, or **Mikhailo**, or more commonly **Lomonosov**; MVL stands for **Mikhail Vasilyevich Lomonosov**^[4]) is an astronomical satellite operated by Moscow State University (MSU) named after Mikhail Lomonosov.^[5]

Mission

The objective of the mission is the observation of gamma-ray bursts, high-energy cosmic rays and transient phenomena in the Earth's upper atmosphere.^[5]

Launch

The mission launch was initially planned for 2011 when 300 years since the birthday of Mikhail Lomonosov was celebrated.^[6] After several postponements the mission was finally launched on 28 April 2016 from Vostochny Cosmodrome by the Soyuz 2.1a launch vehicle.^[7]

Scientific payload

The spacecraft is equipped with seven scientific instruments:^{[4][1]}

- **Tracking Ultraviolet Set Up system (TUS)** was designed to measure fluorescence light radiated by EAS (Extensive Air Showers) of Ultra High Energy Cosmic Rays (UHECR) in the Earth atmosphere as well as for transients' studies within UV-range. This was the first space based instrument dedicated to these phenomena. The TUS-project started in 2001.^[8]

- Block for X-ray and gamma-radiation detection (BDRG) is intended for detecting and monitoring gamma-ray bursts and for producing a trigger signal for ShOK cameras (see below);
- UFFO consists of X-ray and 10 cm UV telescopes intended for studying gamma-ray bursts;
- Optic cameras of super-wide field of vision (ShOK) is a pair of wide-field optical cameras, which main purpose is a prompt detection of the optical radiation of gamma-ray bursts after receiving trigger signals from BDRG;
- Dosimeter of Electrons, PROtons and Neutrons (DEPRON) measures absorbed doses and spectra of electrons, protons, neutrons and heavy nuclei;
- Electron Loss and Fields Investigator for Lomonosov (ELFIN-L) comprises the Energetic Particle Detector for Electrons (EPDE), Energetic Proton Detector for Ions (EPDI) and Flux Gate Magnetometer (FGM). Its main purposes is to study energetic particles in the Earth magnetosphere;
- IMISS-1 is a device intended to test microelectromechanical inertial modules.

End of mission

The TUS-telescope aboard Lomonosov stopped data collection in late 2017.^[8]

On June 30, 2018, it was published that the Lomonosov-satellite had suffered a malfunction in its data transmission system. Attempts to fix the problem were underway, but fixing the problem had so far been unsuccessful.^[9]

As of 14 January 2019, the problems had not been solved and all the scientific equipment of the satellite were powered off. The recovery attempts continued (some systems of the satellite were responsive, the problem was with scientific payload systems). Before succumbing to these difficulties, the satellite had worked for one and a half years for its intended purpose. With the failure of the Lomonosov satellite and the Spektr-R end of mission on 30 May 2019, the Russian space program lost both of its scientific satellites until the launch of Spektr-RG in July 2019.

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9. "Mikhailo Lomonosov" (<http://russianspaceweb.com/mikhailo-lomonosov.html>). *russianspaceweb.com*.

External links

- [Mikhailo Lomonosov at Russianspaceweb.com \(http://russianspaceweb.com/mikhailo-lomonosov.html\)](http://russianspaceweb.com/mikhailo-lomonosov.html)



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