



**SAMARA** UNIVERSITY

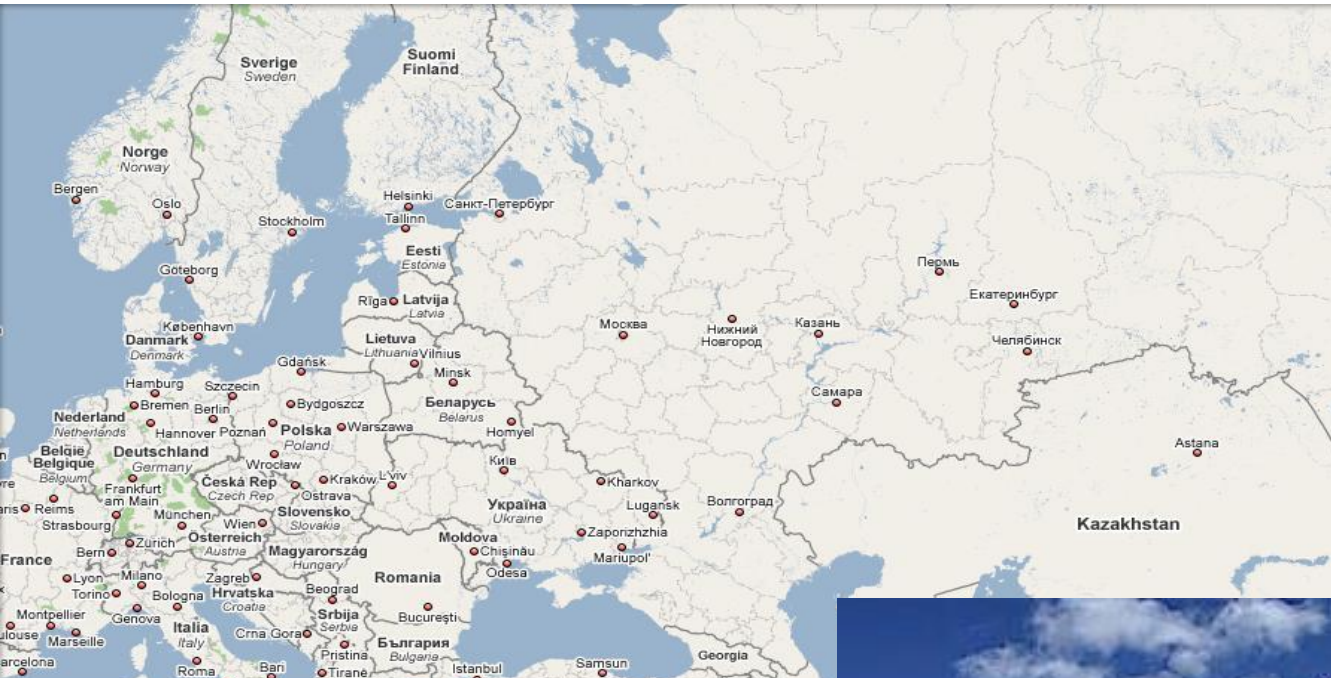
## UNISEC-Samara report 2023-2024

The Head of Inter-university Department of Space  
Research, Professor Igor Belokonov

51st Virtual UNISEC-Global Meeting, December 21, 2024



# Samara region





## UNISEC-Samara: main areas of activity

1. Organization and implementation of Summer Space School “Future Space Technologies and Experiments in Space”.
2. Developing of space technologies and carrying out experiments in space on the base of nanosatellites.
3. Participation in conferences/symposiums/congresses



# 1. Summer Space School “Future Space Technologies and Experiments in Space”

“From mission idea to nanosatellite project.”



## Global participation

- ✓ Participants for 45+ countries with experience and interest in *diverse fields*



## Theoretical & practical knowledge

- ✓ **Duration:** 2 weeks
- ✓ Theoretical and practical classes led by experts, teachers, and researchers *directly involved in real space missions*



## Hands-On experience

- ✓ Classes held in the department's *testing laboratories and flight control center*
- ✓ Team project development supervised by the engineers of the *SamSat family missions*
- ✓ Concept development of a *real nanosatellite mission*
- ✓ Concludes with the *project's defense* presented to a commission of experts



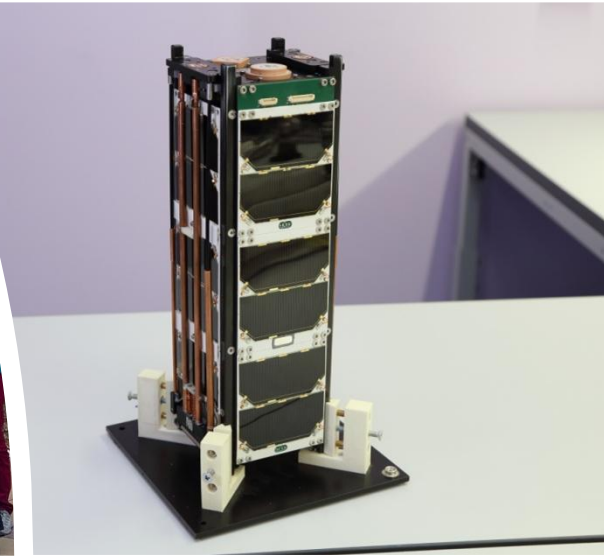
## International recognition

- ✓ All participants receive a certificate of completion equivalent to 3 ECTS



## Unique opportunities

- ✓ Visit the *Space Capital of Russia* during a great weather time
- ✓ Enjoy excursions to famous touristic places, *space and technology museums*
- ✓ Meet people from all over the world and establish *international cooperation*





# 1. Summer Space School “Future Space Technologies and Experiments in Space”



The school was attended by 29 participants from 9 countries:

Russia, Bolivia, Brazil, Ethiopia, Indonesia, Mexico, Myanmar, Pakistan, Peru

## The 18<sup>th</sup> International Summer Space School “FUTURE SPACE TECHNOLOGIES AND EXPERIMENTS IN SPACE”

*From mission idea to project of nanosatellite.*

*June 17-29, 2024 Samara, Russia*

**Organized by**

***Samara National Research University***

***Volga Branch***

***of the Russian Academy of Cosmonautics***

**Supported by**



Space University Administrative Committee of  
the International Astronautical Federation

UNISEC SAMARA





# 1. Summer Space School “Future Space Technologies and Experiments in Space”

Some of the topics covered during theoretical and practical classes were:

- Problems of motion control and navigation of small spacecraft in interplanetary missions
- Orbital mechanics in mission analysis
- Methods and algorithms for nanosatellite attitude determination
- Software development for nanosatellite microcontrollers

Participants were divided in 2 groups and developed two mission concepts:

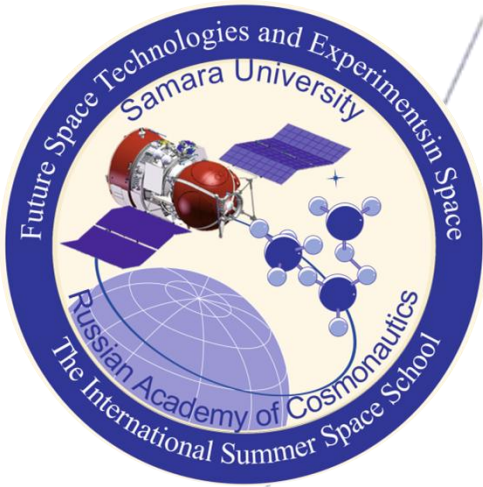
6U CubeSat for remote sensing in the optical spectrum

Constellation of spherical satellites to study the upper layers of the Earth's atmosphere

Among the many activities, students had the opportunity to:

- Conduct a communication session with the department’s satellite at our ground-based Mission Control Center
  - Visit the Rocket Engine Center at Samara University
  - Assemble nanosatellite subsystems using our real engineering model
- Visit the Technical Open-Air Museum in the city of Tolyatti, traveling there by boat along the beautiful Volga River





# International Summer Space School – 2025

Taking place on June 23rd - July 4th, 2025

*Samara, Russia*

In 2025, the School will honour key milestones in space exploration:



60 years since the first human spacewalk



50 years since the first international docking



50 years since the first photos of Venus's surface

**Registration forms accepted until the 28th of February!**



For general information, prices, participation conditions, school calendar and participation form:

<https://volgaspace.org/school-2025>

Any questions left? Don't hesitate to contact us!



space@ssau.ru

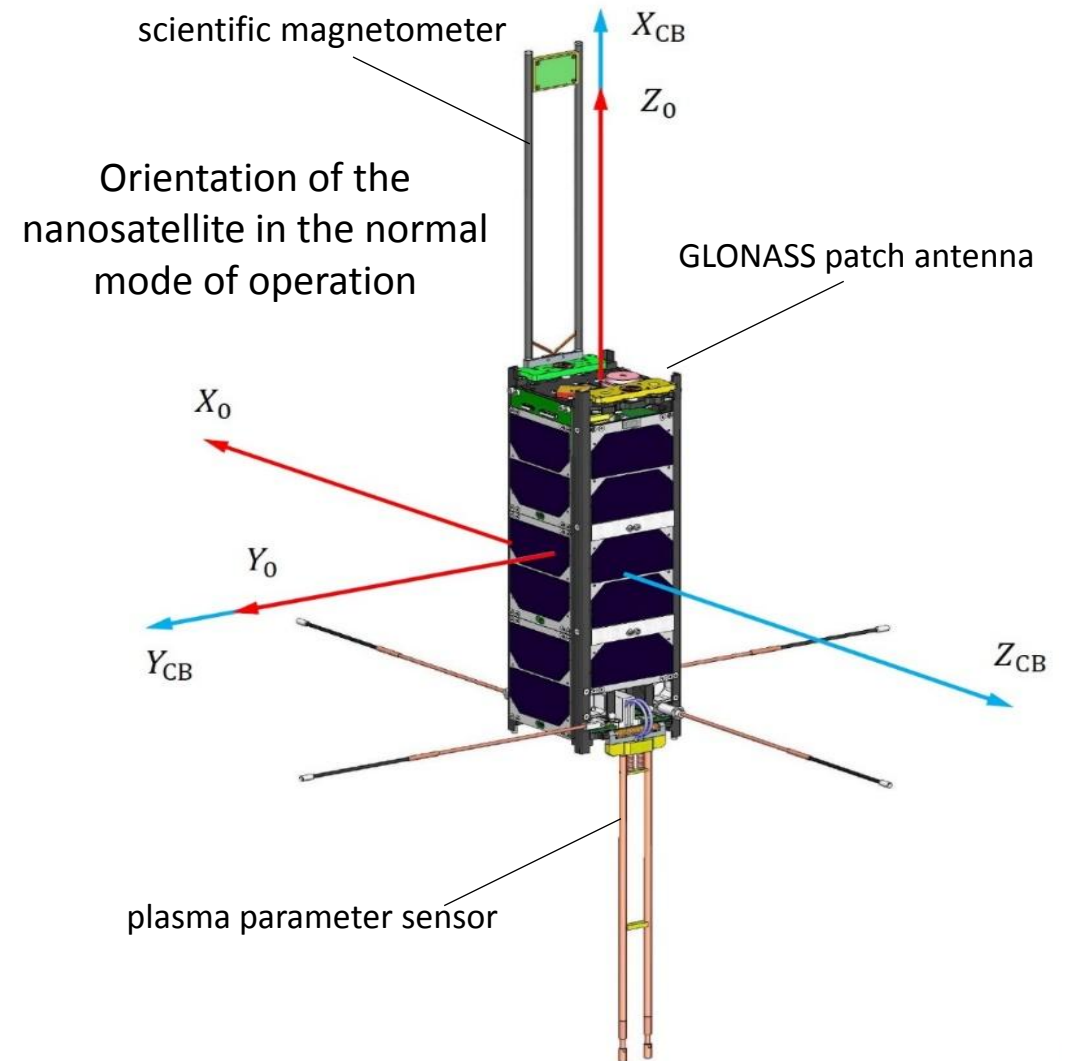


ohanabergerr@gmail.com



### Nanosatellite SamSat-ION

- Orbit type: Sun-synchronous;
- Inclination:  $97.5^\circ$ ;
- Height: 550 km;
- Method of launch: piggy-back launch;
- Launch on orbit: 06/27/2023 from Vostochny Cosmodrome







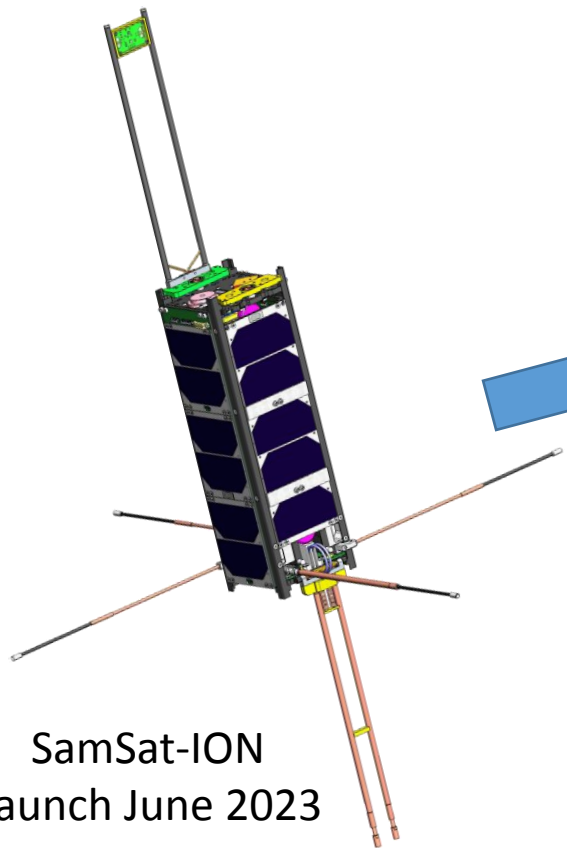
# Flight test of SamSat-ION, June 27, 2023



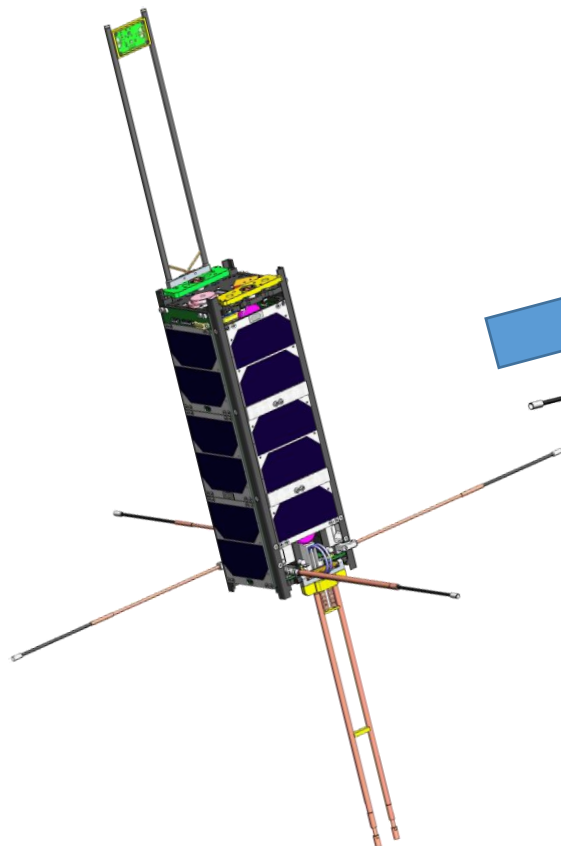


## Separation of the SamSat-ION from the nanosatellite orbital deployer

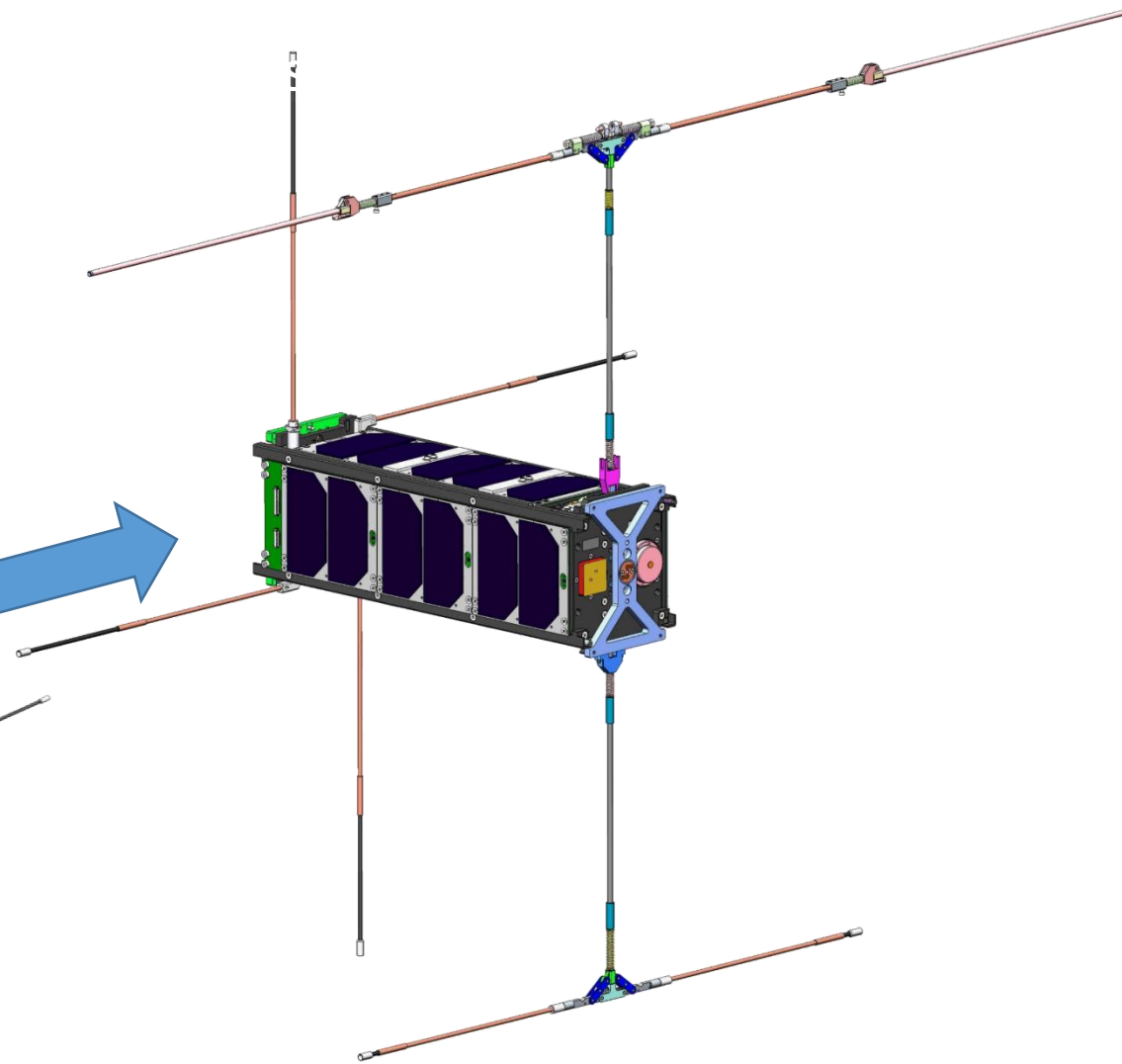
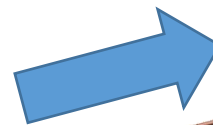




SamSat-ION  
Launch June 2023



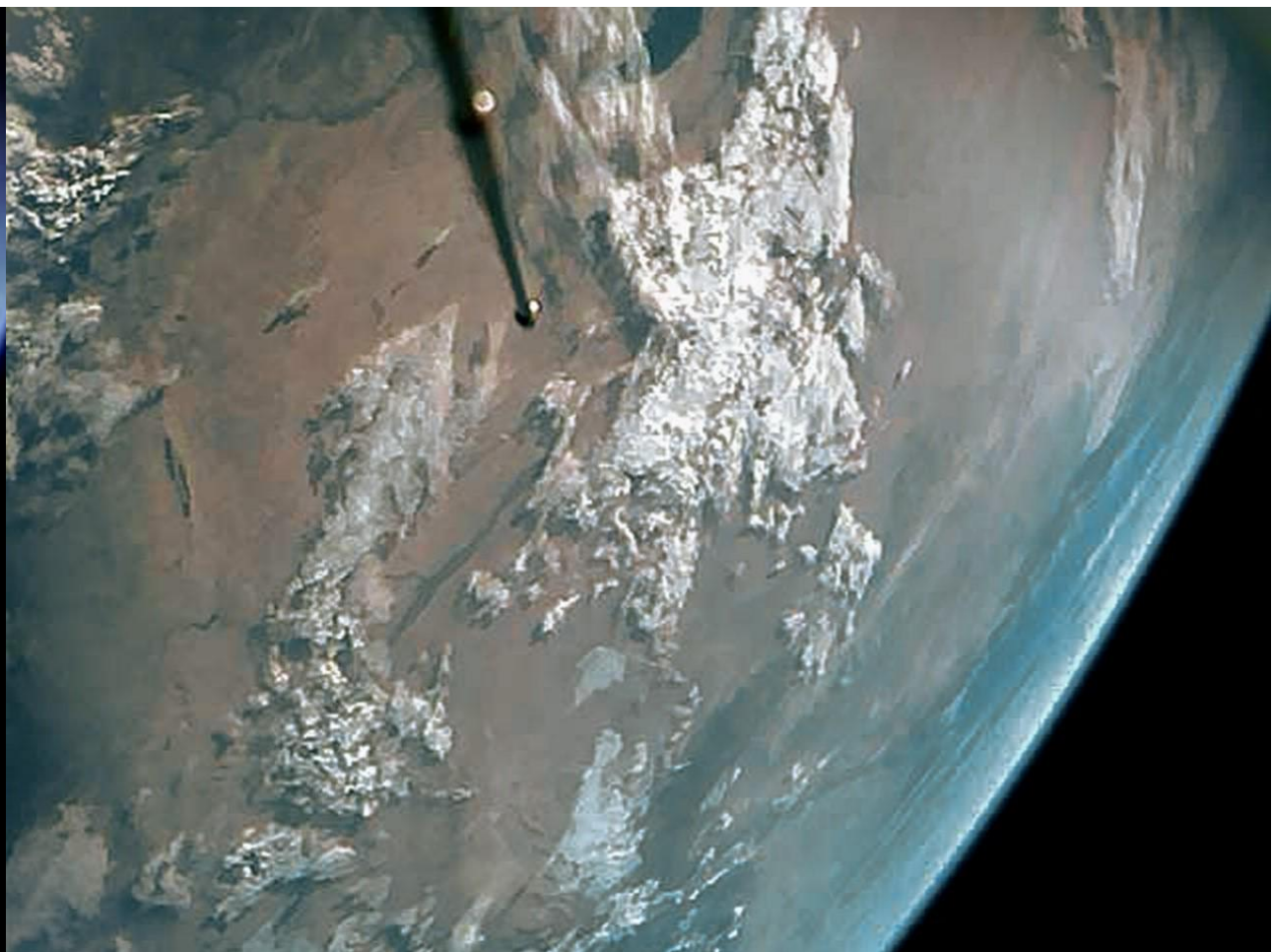
SamSat-Ionosphere  
(SamSat-ION twin)  
Launch November 2024



SamSat-ORION  
Launch Q1 2025



Original image

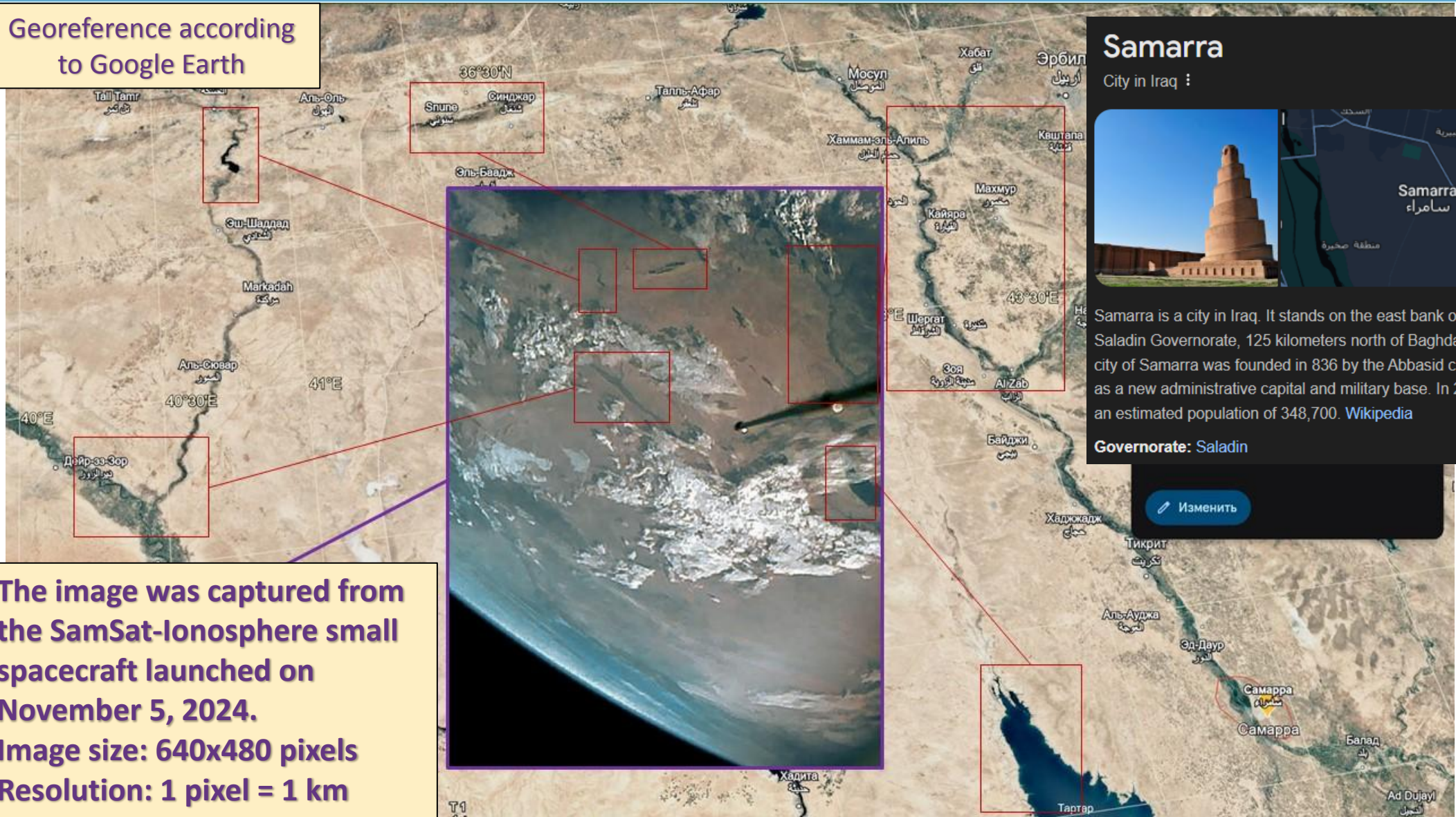


Edited image



# Georeferencing of the image taken on November 20, 2024/ **breaking news**

Georeference according to Google Earth



## Samarra

City in Iraq :



Samarra is a city in Iraq. It stands on the east bank of the Tigris in the Saladin Governorate, 125 kilometers north of Baghdad. The modern city of Samarra was founded in 836 by the Abbasid caliph al-Mu'tasim as a new administrative capital and military base. In 2003 the city had an estimated population of 348,700. [Wikipedia](#)

Governorate: Saladin

Изменить

The image was captured from the SamSat-Ionosphere small spacecraft launched on November 5, 2024.  
Image size: 640x480 pixels  
Resolution: 1 pixel = 1 km



# Georeferencing of the image taken on November 20, 2024/ **breaking news**



Image size: 640x480 pixels  
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The image was captured from the SamSat-Ionosphere small spacecraft launched on November 5, 2024.  
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# VI Russian Symposium on Nanosatellites

We invite you to submit your abstracts (3–5 pages) to the

## VI Russian Symposium on Nanosatellites with International Participation

***From 01 - 03 July, 2025 – Samara,  
Russia***

Abstract submission deadline:

- In-person participants: **28th of February**
- On-line participants: **26th of April**

Based on the results of the presentations, an electronic collection of symposium materials will be published, **indexed in the Russian Science Citation Index (RSCI)**.

The best papers may be recommended for publication in **Leading Russian journals**.

### Covered topics include:

Lessons learned from past  
and current mission

New mission  
concepts

Mission Analysis and  
Design

Guidance, Navigation  
and Control

Enabling  
Technologies

Applications,  
Services, Operations

Simulation, Optimization,  
Verification

Enabling  
Technologies

Scientific Equipment  
for Nanosatellites

Problems of  
Nanosatellites Launch

Nanosatellites  
and Education

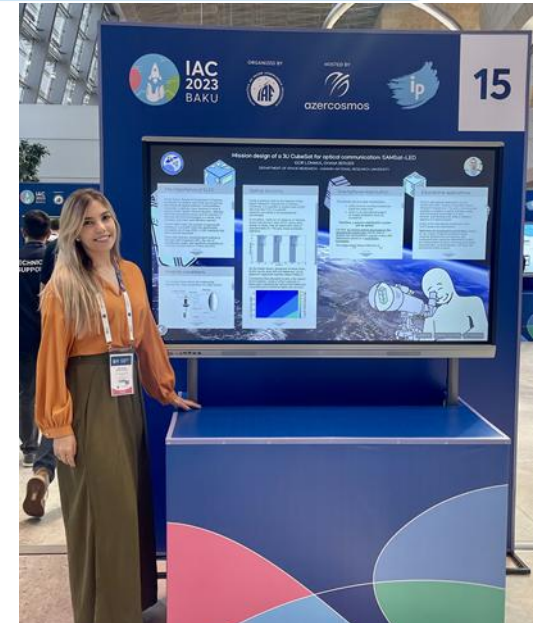
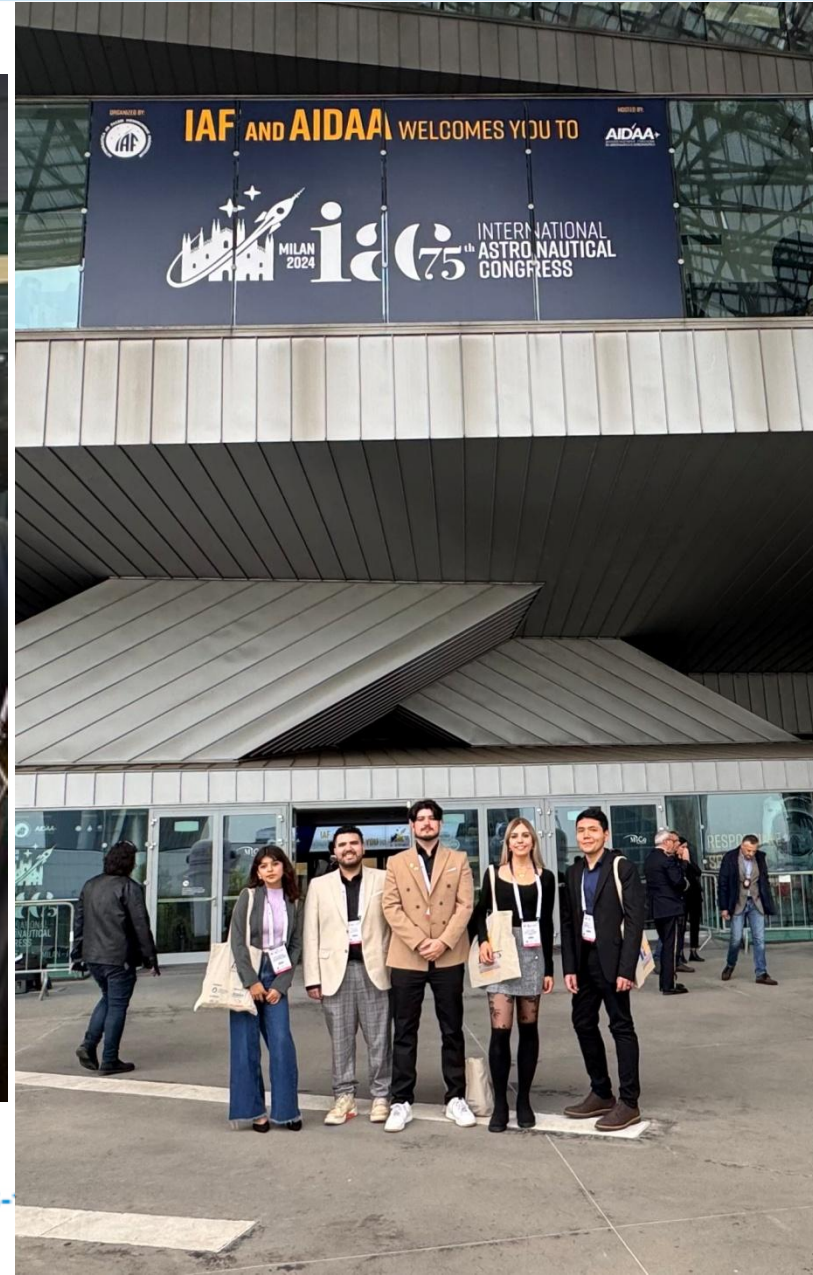
For general information and for the abstract template, please send a message to [rusnanosat@mail.ru](mailto:rusnanosat@mail.ru)

The working language of the symposium is Russian. Foreign participants can be provided with an English, Spanish or Portuguese speaking translator





### 3. Participation in conferences/symposiums/congresses







**AND YOU?**



**HAVE YOU MADE YOUR OWN NANOSATELLITE?**

**THANK YOU  
FOR YOUR ATTENTION**

1. [spaceresearch.ssau.ru](http://spaceresearch.ssau.ru) – department website
2. <http://spacetest.ru/> - website of the center of nanosatellites testing
3. Department e-mail: [space@ssau.ru](mailto:space@ssau.ru)