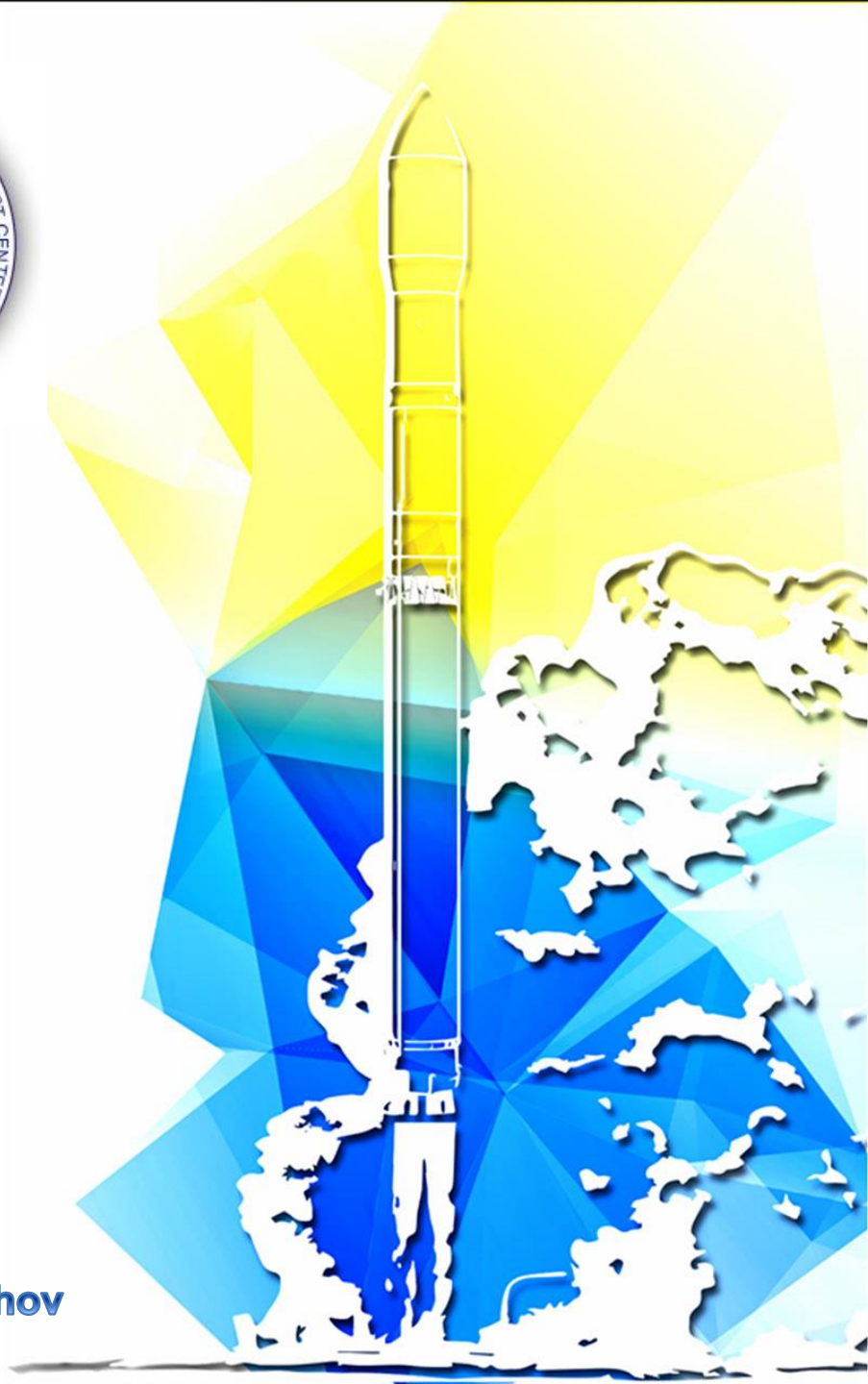
National Space Facilities
Control and Test Center of
State Space Agency of Ukraine

Near-Earth Space Observation Activities at Ukraine in 2020

Dr. O.Kozhukhov



Main Activities in 2020

Observations of spacecraft and space debris for Ukrainian Space Monitoring and Analysis System (SMAS)

Sensors modernization and new sensors development

International Cooperation

NEOs observations

SMAS Facilities

Radar 5N86 "Dnepr", Mukachevo

Perspective L-band Radar

Perspective cm-band radar

QOS "Sazhen-S" and OEOS type 1 at CSIRP and NFC, Dunaivtsi

Outer Space Monitoring Center

Optical sensors at Lviv National University

Optical sensors at Odesa Astronomical Observatory

OEOS type 2 at RD SCP, Novosilky, Kyiv region

Optical sensors at Uzhhorod National University

Radar Surveillance Facilities of SMAS in 2020

Modernized UHF Radar (5N86)

- Detection of SO in the sector 120 degrees at a range: from 250 to 5600 km

Replacement of the control and data processing system; Start of implementation of new receiving equipment

L-band radar with digital antenna array

- Detection of SO in all directions (support and rotary device) at a range: up to 3000 km
- Modular principle of the construction of receiving and transmitting equipment

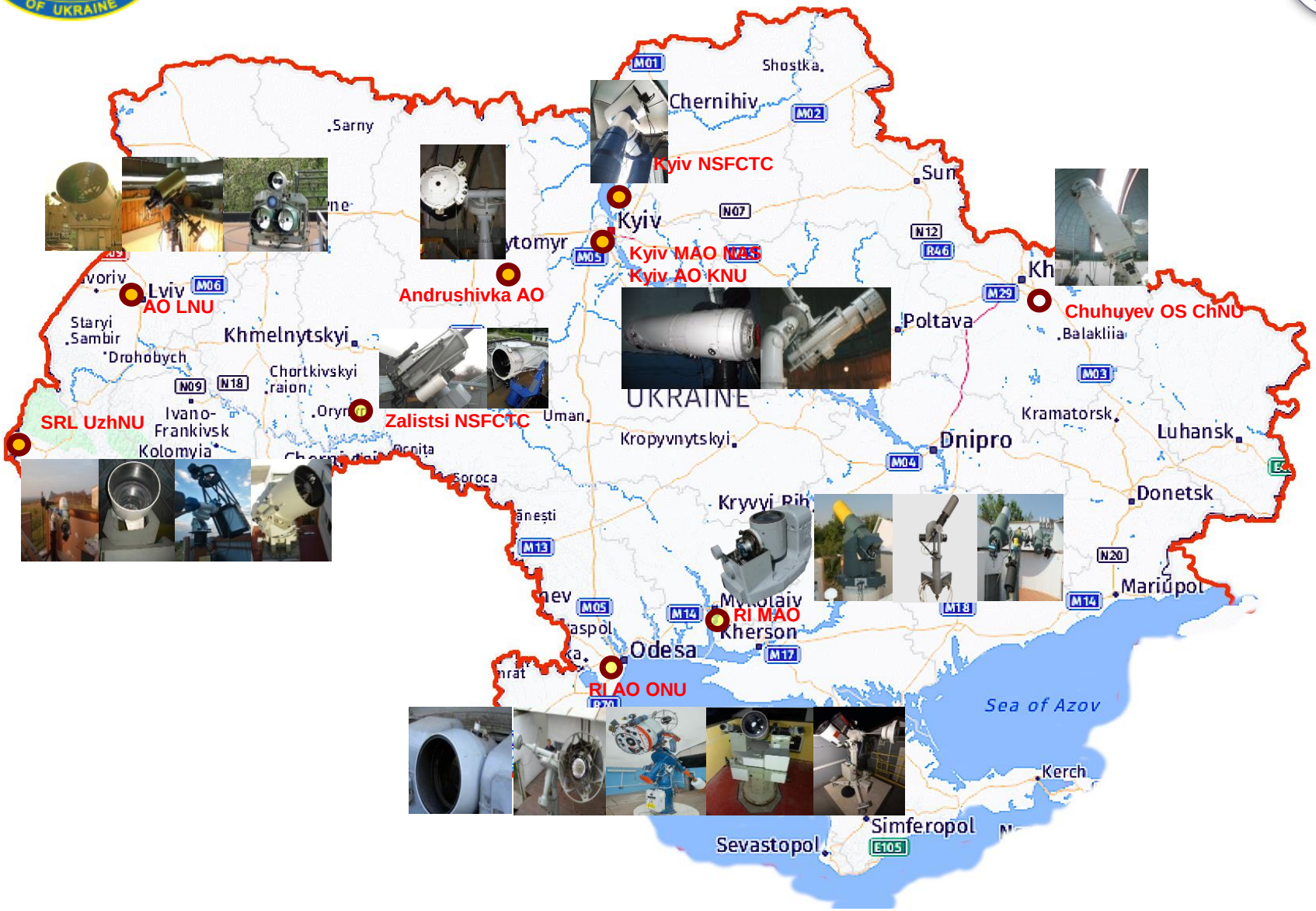
The first stage of creation is completed; Undergoing tests

Perspective centimeter-band radar based on the 25-m Cassegrain antenna

- Ultraprecise measurement of orbit parameters of SO
- Identification of the spacecraft designation

Under development; Research is being carried out to create the radar

Optical Sensors of SMAS



Optical Sensors of SMAS in 2020

QOS "Sazhen-S", Khmelnitsky region

New control system, new camera of Wide FoV

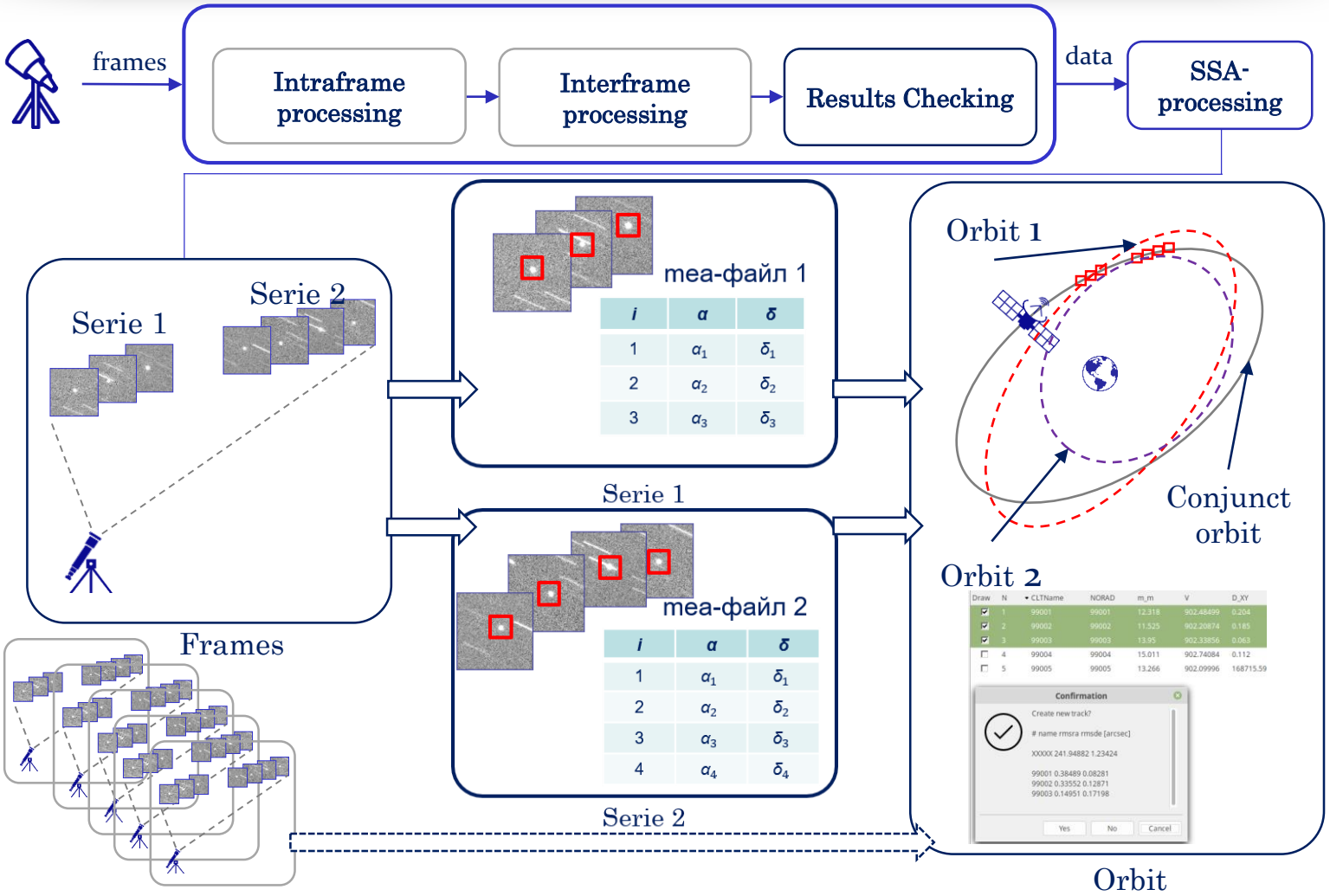
OEOS, type 1, Khmelnitsky region

New 0.5 m f/3.8 telescope.
Operational (GEO, MEO, NEO)

OEOS, type 2, Kyiv region

New 0.3 m f/1.0 telescope.
Operational (GEO, MEO, LEO)

Software for Satellites Observations Processing



Space Observations Center

Main analytical unit of SMAS is the **Space Observations Center (SOC)**.

Main tasks of the OSMC

- Collecting and storing information about the space situation from all possible sources (means of observation, Internet, etc.), data processing.
- Analysis of space situation data.
- Formation of tasks for monitoring facilities.
- Providing information to SMAS users.

Main Activities in 2020

- Daily calculation of ephemeris for optical sensors of SMAS;
- Receiving and processing data from SMAS sensors;
- Weekly prediction of the existence time of RSO and their possible impact areas;
- 1045 predictions of possible approaches of selected spacecrafts with other SO.

International Cooperation

Participation in the work of the IADC including observation campaigns;

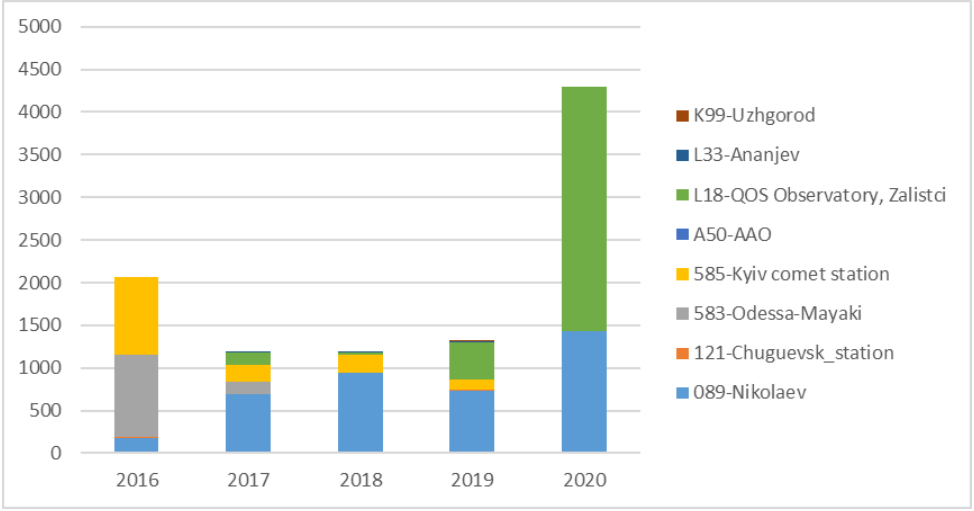
Cooperation with PolSA and other Polish organizations;

Negotiations with other space agencies (India, Greece, Turkey…).

Near Earth Objects

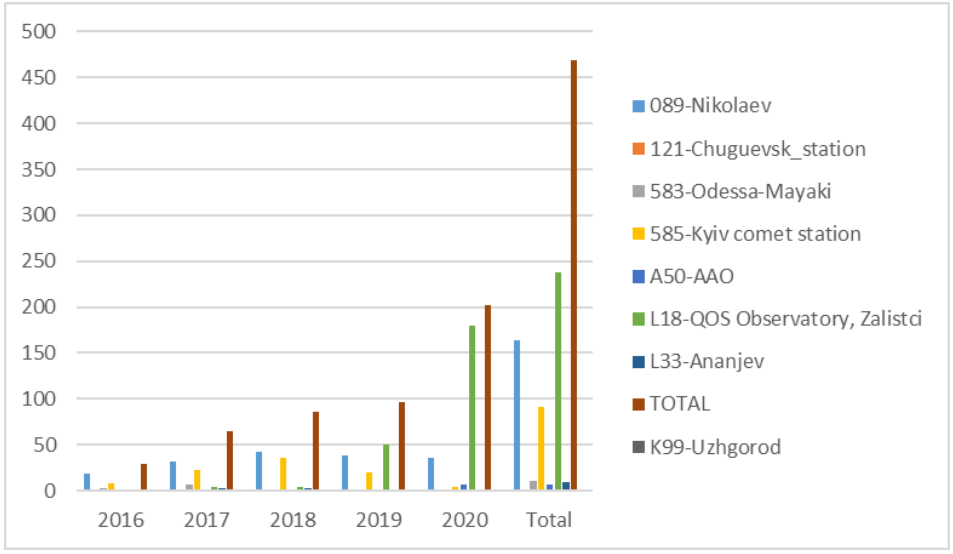
Observation of NEOs by Ukrainian observatories in 2016-2020

Observations

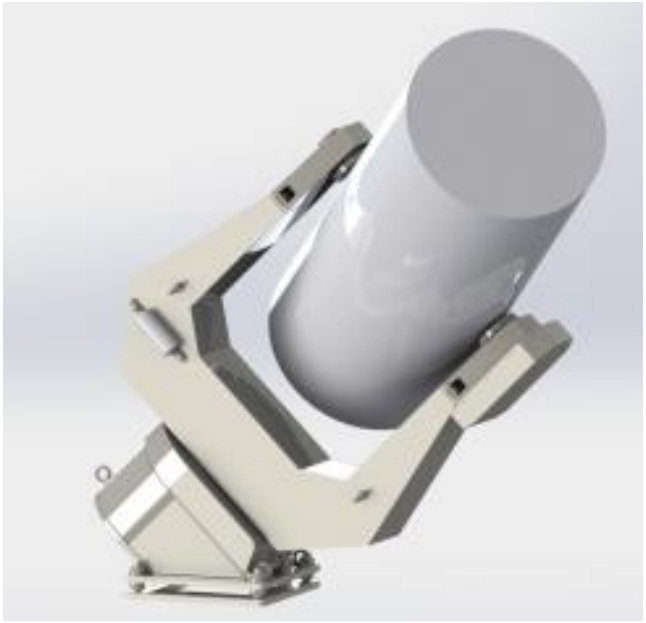


Total: 10142 observations, 469 NEOs (*https://newton.spacedys.com/neodys/*)

Objects



Optical sensors

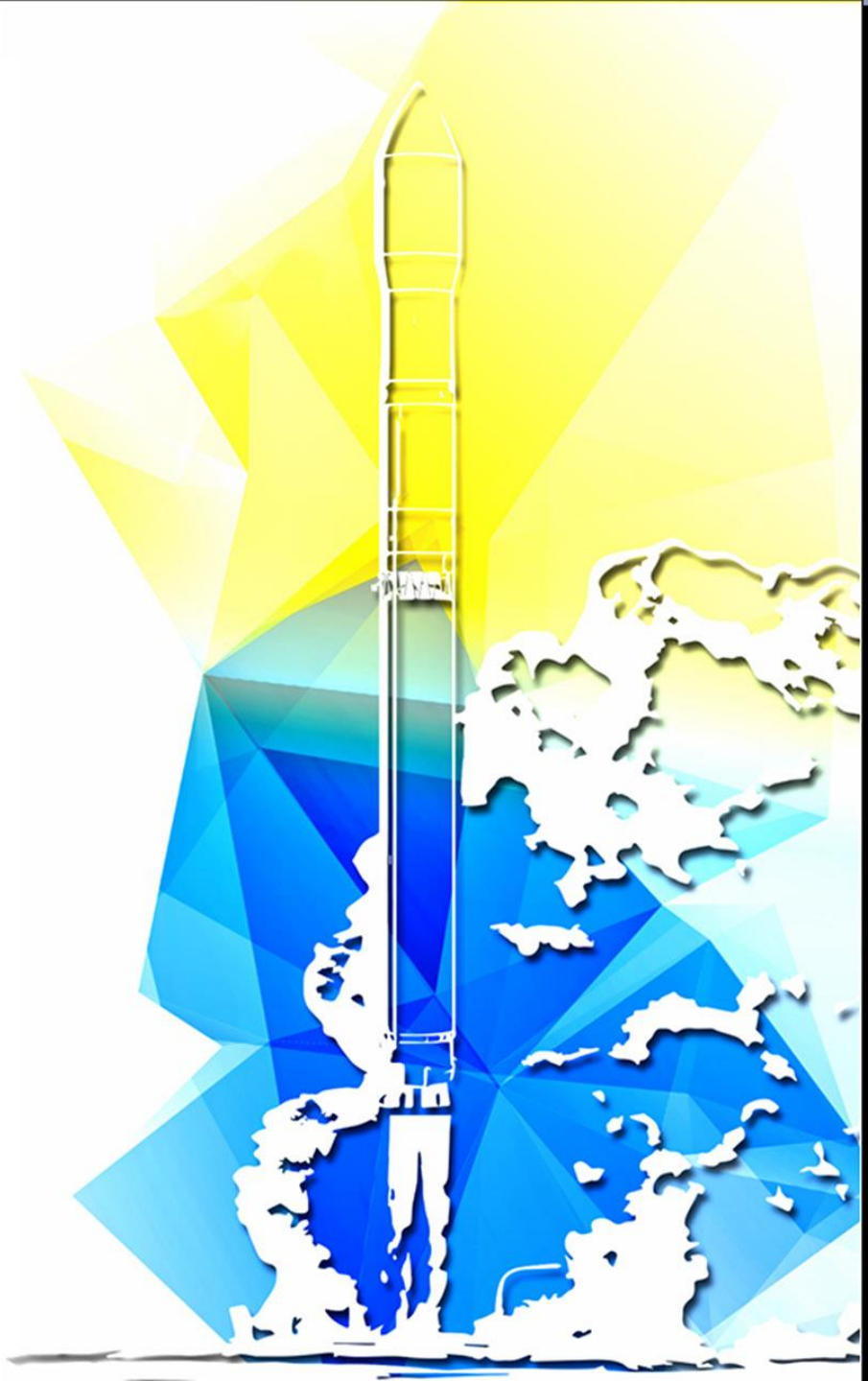


0.35 m f/2.0 telescope with **CMOS** camera (NSFCTC)

Conclusion

Despite the unfavorable conditions (COVID-19), Ukraine continues to improve its capabilities for monitoring near-Earth space.

THANK YOU FOR YOUR ATTENTION!



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