



Taras Shevchenko National University of Kyiv

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Taras Shevchenko National University of Kyiv (TSNUK)

🎓 Established in 1834 as the Imperial University of St. Volodymyr

🏛️ One of the oldest and most prestigious universities in Ukraine

🔬 Holds the status of a research university, a national leader in science



📖 Role in Ukraine's education and research system:

- A top institution in higher education and fundamental research
- A center for training highly qualified scientific personnel
- Participant in national and international scientific programs

Structure:

13 faculties, 7 educational and scientific institutes, Educational and Scientific Center, 3 educational institutes, 2 separate structural units, Ukrainian Physical and Mathematical Lyceum, botanical garden, museums, Astronomical observatory

Research challenges

🔭 Astronomical Observatory of KNU:

- Founded in 1845
- Separate scientific unit of the University, conducting fundamental research
- Serves as a teaching and training base for students and postgraduates

Department of Astronomy and Space Physics:

- Part of the Faculty of Physics
- Trains Bachelors, Masters, and PhD students in astronomy and astrophysics
- Closely integrated with the Observatory — the full-cycle astronomy education



Academic excellence



Core Areas of Astronomical Research

Since its founding in 1845, the Observatory focused on geodetic and astrometric research.

Beginning the leadership of Serhiy Vsekhsvyatsky (1939), five major research directions were gradually established:

- ❖ **Relativistic Gravitation and Cosmology** (Team Lead: Prof. Valeriy Zhdanov)
- ❖ **High-Energy Astrophysics** (Team Lead: Prof. Bohdan Hnatyk)
- ❖ **Solar Physics, Solar Activity** (Team Lead: Dr. Sci. Vsevolod Lozytsky)
- ❖ **Astrometry and Small Bodies of the Solar System** (Team Lead: Dr. Sci. Vira Rosenbush)
- ❖ **Atmosphere and Ionosphere Research** (Team Lead: Prof. Vasyl Ivchenko)
- ❖ **History of Astronomy** (Team Lead: PhD Liliya Kazantseva)



Role in Ukraine's National Research Ecosystem

Taras Shevchenko National University of Kyiv plays a strategic and multifaceted role in Ukraine's national research ecosystem. Its contributions span fundamental science, education, and international collaboration. Here's an overview of its key roles:

- The center for astronomical education and research.

Provide:

Training and mentoring of students, postgraduates, and early-career researchers in astronomy;

Access to **research-grade telescopes and instruments**: enabling hands-on learning and thesis work, scientific researches;

Development of national scientific capacity through educational outreach and formal education.

This ensures continuity of scientific expertise in astronomy in Ukraine.



General Structure: Astronomical Observatory and Department of Astronomy

Astronomical Observatory

Independent research unit within TSNUK

Subordinated to the University administration (Vice-Rector for Science)

Main Structural Units

Administration: Director, Deputy Directors (science, operations), Scientific Council

Scientific Departments / Groups:

1. Astrophysics
2. Solar Physics and Solar Activity
3. Astrometry and Small Bodies of the Solar System

Journal: Bulletin of Taras Shevchenko National University of Kyiv. Astronomy

Museum of Astronomy

Library

Department of Astronomy and Space Physics

Academic unit within the Faculty of Physics

Main Structural Units

Head of Department, Secretary, 5 Academic Staff

Educational Laboratory:

- Head of Laboratory
- 2 Engineers
- 1 Technician

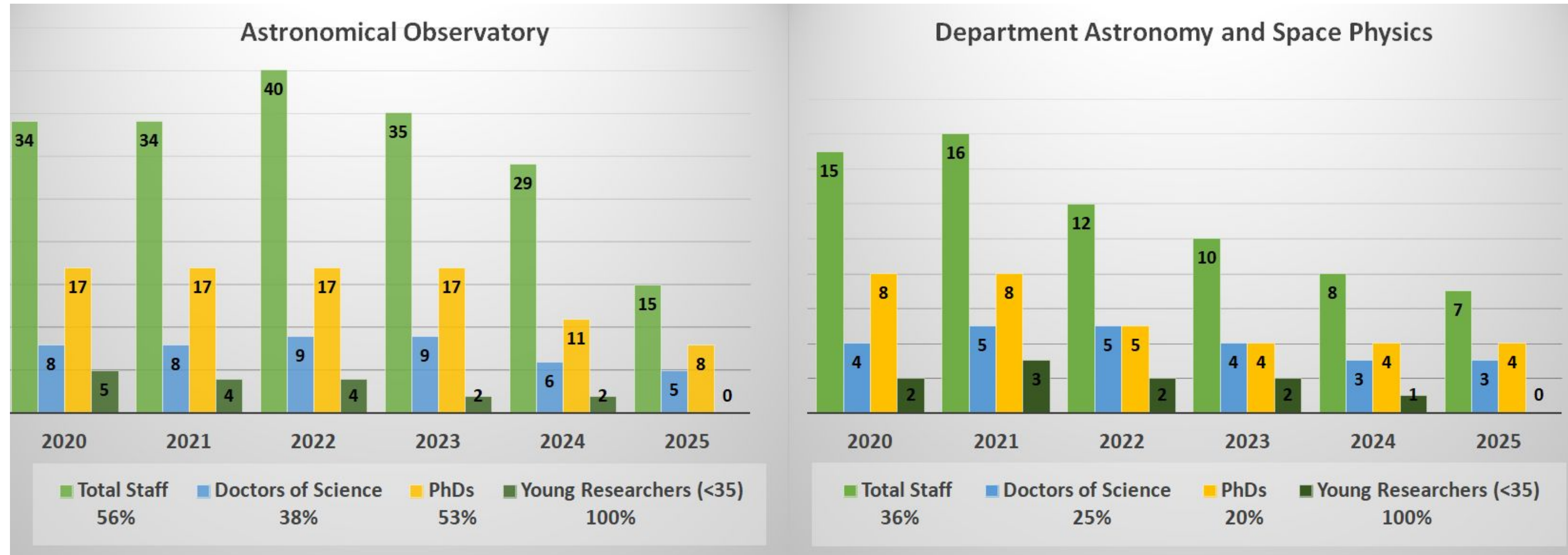
Shared Observational Facilities

Center for Collective Use of Scientific Equipment: "Laboratory of High Energy Physics and Astrophysics"

- **Central Building (Kyiv, Observatorna St. 3):** Horizontal Solar Telescope
- **Observational Station in v. Lisnyky:** Telescopes: AZT-8 (70 cm), AZT-14 (45 cm), Meteor Patrol System
- **Observational Station in v. Pylypovychi:** Telescope Celestron (30 cm), Meteor Patrol System



Trends in Academic and Research Staff Numbers



Like many institutions in Ukraine, both our units show a **decline in total staff and young researchers** by 2025. The **Astronomical Observatory** experienced more significant drops in staff numbers and younger personnel.

One of the reasons is **Relocation Abroad**: Some staff members have moved abroad and did not return.

Despite decreasing totals, the **proportion of highly qualified personnel** (Doctors and PhDs) remained relatively stable.

Impact of the war

Astronomical Observatory

At the beginning of the full-scale invasion, during the assault on Kyiv, the main building of the Astronomical Observatory was not damaged. One of the remote observing stations, located in the village of Pylypovychi near Borodianka, was under occupation for some time. Fortunately, the station's buildings were not harmed.

At the observing station in the village of Lisnyky, we continue to upgrade the AZT-8 telescope and conduct regular observations.

Remnants of drones and missiles occasionally fall on the Observatory's territory, but without causing critical damage.

Despite these risks, the staff of Observatory has continued working, maintaining scientific activity and infrastructure as much as possible.



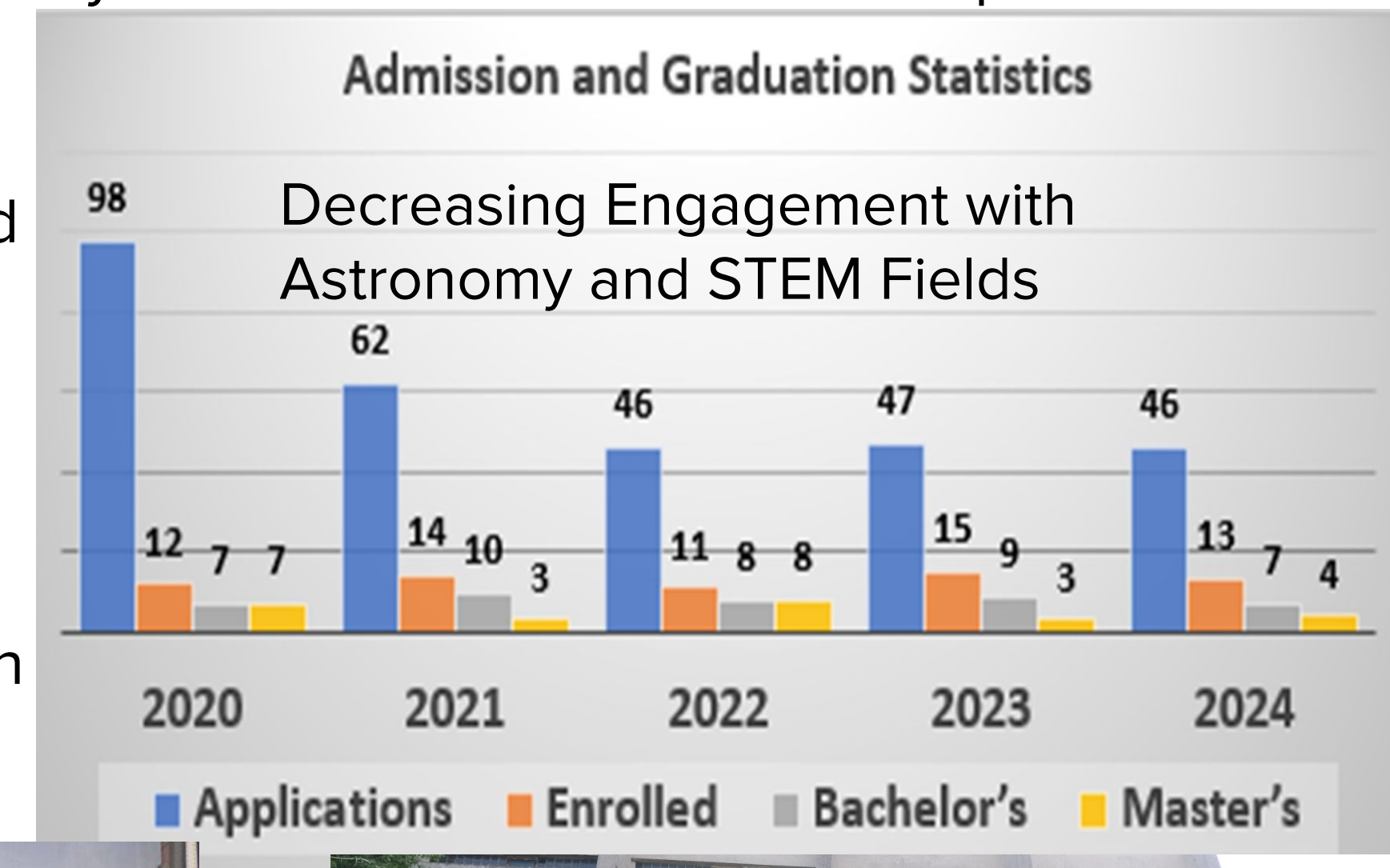
Department of Astronomy and Space Physics

Damage to educational infrastructure: nearby explosions shattered windows and damaged faculty walls

Some classes held in bomb shelters

Overall decline in student enrollment

Decreased public interest in astronomy and science in general:
a reduced number of student applications (blue colour), resulting in lower number of graduates.



Scientific Work During Wartime and the Importance of International Support

Key Activities by the Observatory Staff:

- ❖ Staff continue scientific work despite wartime challenges.
- ❖ Three colleagues serve in the Armed Forces (R. Hnatyuk, A. Luzan, S. Kolisnyk).
- ❖ Five ongoing state-funded research projects.
- ❖ Participation in international grants:
 - CTAO (Cherenkov Telescope Array) – Team Lead: Prof. Bohdan Hnatyk
 - HORIZON-INFRA-2023-SERV-01 Grant 1-1131928 ACME (Astrophysics Center for Multimessenger studies in Europe) - Team Lead: PhD. Lidiya Zadorozhna
 - DFG grant BL 298/32-1 “The Cohesion Bottleneck and the Activity of Distant Comets” - Team Lead: PhD Ihor Lukianyk
- ❖ Ongoing telescope modernization and observations at Lisnyky station.
- ❖ Active in education and science outreach.

Key Challenges: — *Insufficient funding* — *Outflow of young researchers* — *Generational change*
Proposed Solution: — *Dissemination* — *Integration into international research consortia* — *Participation in HORIZON EUROPE projects*

Also the expansion of our journal’s reach, particularly through inclusion in Scopus, facilitates greater international collaboration.

These will ensure good conditions for young scientists in Ukraine.

For the Department of Astronomy also important:

- Upgrade and modernization of laboratory and observatory equipment
- Expansion of summer training opportunities
- Support for educational initiatives: olympiads, competitions, workshops, and training programs

CTAO ERIC – A Key Example

The European Commission’s Implementing Decision (EU) 2025/7 established CTAO as an ERIC on 7 January 2025.

Ukraine (with KNU as main team) is a full member of the CTAO Consortium since 2015. But the current membership status of Ukraine in CTAO is valid **only until 31 December 2025**. What it means for us? We will lose the opportunity to meaningfully engage young scientists inside Ukraine. Without local involvement, our students would be forced to leave the country to participate. **Continued membership in CTAO is not just about science - it's about creating real future opportunities for Ukrainian youth within their own country.**

ACME – positive example of collaboration

- Effective access to the best research infrastructures
- Training a new generation of scientists and engineers



Ukrainian Virtual Observatory VIRGO.UA will be integrated into the MMODA (Multi-Messenger Online Data Analysis) platform to facilitate integration with the **European Open Science Cloud (EOSC)**, provide access to archives of telescope and detector data, and offer services for data analysis and modeling.

Alumni Impact



This map shows where graduates of our institution are now working — in Europe, North America, Asia, and beyond. Many of them are active in universities, observatories, and research institutes, making strong contributions to global science. Their success reflects the quality of education and research in Kyiv — and the lasting impact of Ukrainian astronomy worldwide.

Слава Україні
Горі честь
Лялечка неволена
Кохана



**Thank You for
Attention!**

