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Astronomy in Türkiye: Current Status and Recent Developments

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Abstract

In this paper, the aim is to provide an updated overview of the institutions, facilities, and community in Türkiye. The current status of astronomy in Türkiye is presented along with developments from the last few years. The Türkiye National Observatories, as a new research center, and the radio astronomy initiatives are introduced. Activities of the Turkish Astronomical Society (TAD), such as the National Astronomy Congresses, international workshops hosted in Türkiye, astronomy olympiads, and public outreach events, are summarized.

Keywords: *astronomy: general, observatories, telescopes, education, public outreach*

1. Introduction

Anatolia has a long history in terms of people's interest in the sky. Excavations in different parts of the region have revealed many archeological findings that may have astronomical significance. Hattusa, Alacahöyük and especially Göbeklitepe (10th millennium BCE) are the best known among them. Göbeklitepe is accepted as one of the oldest megalithic structures in the world, and according to some archaeoastronomical studies, its pillars may have been oriented towards the rising points of bright stars. Another example is the Kingdom of Commagene (163 BCE – 72 CE). The "Lion Horoscope" relief at Mount Nemrut, built in the time of King Antiochus I, shows Jupiter, Mercury, and Mars together, and this configuration is generally dated to July 62 BCE.

Coming to more recent history, the Istanbul Observatory of Taqi al-Din was completed in 1577, and it was one of the most advanced observatories of its time. However, it was demolished only three years later, in 1580. Institutional astronomy appeared again in the late Ottoman period with the Imperial Observatory (1868), which later became the Kandilli Observatory (1911)[1]. The real turning point came after the foundation of the Republic. With the University Reform of 1933, the Istanbul Darülfünun was reorganized as Istanbul University, and the first astronomy department of the country was founded in the same year[2]. Its observatory followed in 1935[3]. Scientists who came from abroad in those years, many of them escaping from Nazi Germany, such as E. Finlay-Freundlich, H. Rosenberg, T. Royds, W. Gleissberg and E. A. Kreiken, had a great share in the establishment of modern astronomy in Türkiye (Alis, 2019, Aliș, 2020, Eker et al., 2013, Fisek & Alis, 2026).

2. Astronomy in Higher Education

Being the first in the country, the Astronomy Department of Istanbul University became a model for astronomy education and research, and its graduates took part in the establishment of other departments. Today, there are seven departments under the names of astronomy and space sciences or space sciences and technologies (Table 1). Astrophysicists also work in the physics departments of many universities;

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Boğaziçi, Sabancı, Istanbul Kültür, İnönü, Akdeniz, Çanakkale Onsekiz Mart, Yıldız Technical, Süleyman Demirel, Çukurova, Middle East Technical and Adıyaman Universities are among them. Some of these physics departments have astrophysics groups that carry out research and provide graduate education. The distribution of the departments and observatories on the map of Türkiye, together with the ancient sites mentioned above, is shown in Figure 1.

Table 1. Astronomy and related departments in Türkiye in chronological order.

University	**Department**	**Founded**
Istanbul University	Astronomy and Space Sciences	1933
Ankara University	Astronomy and Space Sciences	1962
Ege University	Astronomy and Space Sciences	1965
Erciyes University	Astronomy and Space Sciences	1999
Çanakkale Onsekiz Mart University	Space Sciences and Technologies	2012
Akdeniz University	Space Sciences and Technologies	2012
Atatürk University	Astronomy and Space Sciences	2013



Figure 1. Map of astronomical institutions and observatories in Türkiye, updated from Eker et al. (2013) to present recent developments. Squares denote astronomy and space sciences departments, triangles denote other departments in which astrophysics research is carried out, stars denote observatories, and balloons denote ancient sites with a connection to astronomy.

3. Observatories in Türkiye

University and National Observatories are listed in Table 2. As for the optical telescopes, there are currently one 1.5 m, one 1.2 m, one 1 m and one 0.8 m telescope, three 0.6 m and three 0.5 m telescopes in the country, and the 4 m telescope of the Eastern Anatolia Observatory (DAG) is in the commissioning phase. Besides these, many telescopes with apertures of 0.4 m and smaller are in operation. These small telescopes are mainly used for education, but they are also very useful in campaigns and follow-up observations, for example in stellar occultation campaigns.

Among the university observatories, the Istanbul University Observatory can be given as an example, since it continues its observations both with a historical telescope and with modern ones. The observatory started its operations in 1936, and the solar observations, which are made with a 13 cm refractor as hand drawings

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Table 2. University and National Observatories in Türkiye.

Observatory	Founded
Kandilli Observatory	1868
Istanbul University Observatory	1935
Ankara University Observatory	1963
Ege University Observatory	1965
Çukurova University UZAYMER	1991
TÜBİTAK National Observatory (TUG)	1997
ÇOMÜ Ulupınar Astrophysical Observatory	2002
Erciyes University Radio Astronomy Observatory	2007
Eastern Anatolia Observatory (DAG)	2011
İnönü University Observatory	2012
Adıyaman University Observatory	2014
Eskişehir Technical University Yunus Emre Observatory	2018
Türkiye National Radio Astronomy Observatory (TURAG)	in project phase

TRGöz (2023)

of the photosphere, have continued without interruption from 1945 to the present day[4]. The historical 30 cm Zeiss Astrograph, on the other hand, is not used anymore; today the night-time observations are carried out with two modern telescopes of 40 cm and 60 cm aperture. The 40 cm IST40 telescope is located at the Beyazıt Campus in Istanbul. Although it is mostly used for education, in order to give the students practice in observation, it has also contributed to a number of scientific publications. The 60 cm IST60 telescope is located at the Ulupınar Astrophysical Observatory of Çanakkale Onsekiz Mart University, and it can be used both remotely and in robotic mode (Aliş et al., 2020, Fisek & Alis, 2026).

3.1. Türkiye National Observatories

The most important administrative change of the last years is about the management of the national facilities. Until recently, TUG was an institute of TÜBİTAK (the Scientific and Technological Research Council of Türkiye)[5], and DAG was a project coordinated by the Astrophysics Research and Application Center of Atatürk University (ATASAM). With a decision of the Ministry of Industry and Technology[6], the space science infrastructures of these two institutions were brought together under a single research center called Türkiye National Observatories (Türkiye Ulusal Gözlemevleri - TRGöz)[7]. The legal basis of this structure is Law No. 6550 on Supporting Research Infrastructures. This law entered into force in 2014 in order to provide an efficient use and sustainability of the research infrastructures in the country. Infrastructures which are qualified under this law have a legal personality and their own management, and they are financed according to their performance.

Türkiye National Observatories was established as a partnership between ATASAM and TÜBİTAK, and it received its qualification under Law No. 6550 on 25 April 2023 with the status of "Advanced Research Infrastructure". It is also the first "Joint Research Infrastructure" of Türkiye within the scope of this law. Considering that DAG and TUG together represent the largest investment of the country in fundamental sciences and space sciences, the new structure is expected to form an ecosystem for space sciences in Türkiye and to support the studies in this field with its strong infrastructures and up-to-date technologies.

3.1.1. TUG Campus

The TÜBİTAK National Observatory (TUG) was inaugurated in 1997. It is located at Bakırlıtepe in the Taurus Mountains near Antalya, at an altitude of 2500 m (Figure 2). The largest optical telescope which is currently in operation in Türkiye, the 1.5 m Russian-Turkish Telescope (RTT150), is on this campus. The telescope is operated together with Russia and the observing time is shared equally. RTT150 can be used for both imaging and spectroscopy, and it has been the main instrument of Turkish astronomers for more

[4] https://astronomi.istanbul.edu.tr/arsiv.php
[5] https://tubitak.gov.tr/en
[6] https://sanayi.gov.tr/
[7] https://trgozlemevleri.gov.tr/en

than twenty years. There are also 1 m, 0.6 m and 0.4 m telescopes on the campus. Different from RTT150, the whole observing time of these telescopes is given to the Turkish community.



Figure 2. (left) The TUG Campus of the Türkiye National Observatories at Bakırlıtepe (2500 m), Antalya. (right) The 1.5 m Russian-Turkish Telescope (RTT150). Images: Türkiye National Observatories.

3.1.2. DAG Campus

The Eastern Anatolia Observatory (Doğu Anadolu Gözlemevi - DAG) is the largest astronomy project of Türkiye so far (Yesilyaprak et al., 2016, Yeşilyaprak, 2020, Yeşilyaprak & Keskin, 2020). The campus is on the Karakaya Hills in Erzurum, at an altitude of 3170 m (Figure 3). Today, the 4 m primary mirror has been brought to the site and the mechanical installation of the telescope has been completed (Yesilyaprak et al., 2022).



Figure 3. The DAG Campus of the Türkiye National Observatories. (left) The observatory site on the Karakaya Hills (3170 m), Erzurum. (right) The telescope installed inside its enclosure. Images: Türkiye National Observatories.

With its 4 m primary mirror, the DAG Telescope will be the largest telescope of the country. More importantly, Turkish astronomers will be able to observe in the near-infrared with a national facility for the first time. The optical design, the mirror coating and the focal-plane instruments were all planned for this wavelength range. The telescope has both active and adaptive optics systems, and the goal is to obtain diffraction-limited images (Yeşilyaprak & Keskin, 2020). The telescope reached its technical first light (Yesilyaprak et al., 2024); the integration of the camera and the focal-plane instruments is about to be completed and the first scientific observations are expected soon. There are more facilities on the campus.

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For example, the Mirya-μ1 cosmic ray detector[8], which was developed at Istanbul University, now works at DAG as a space weather monitoring station (Dag et al., 2025).

3.2. Radio Astronomy and TURAG

Until now, radio astronomy in Türkiye has been represented mainly by the Erciyes University Radio Astronomy Observatory (UZAYBİMER)[9] in Kayseri, which was founded in 2007 and operates a 12.8 m radio telescope (Yıldız, 2026). The Türkiye National Radio Astronomy Observatory (TURAG) is a project led by the Department of Astronomy and Space Sciences, Erciyes University, and its purpose is to establish a national radio observatory (Öztürk et al., 2020). The project is still in the development phase, but some important international steps have already been taken. The first one is the BURSTT (Bustling Universe Radio Survey Telescope in Taiwan) project, which was designed to detect and localize fast radio bursts. Following an official invitation from Taiwan, a project covering the years 2027–2030 was submitted to the Presidency of Strategy and Budget of the Presidency of the Republic of Türkiye under the coordination of Erciyes University (Yıldız, 2026). The station planned in Kayseri will consist of 64 log-periodic dipole antennas working in the 300–700 MHz band, and at a distance of about 7900 km from the main station in Taiwan it will be the westernmost outrigger of this intercontinental VLBI network. The second one is the Square Kilometre Array Observatory (SKAO). Joining this organization is considered a strategic aim in line with the National Space Program, and its importance for the researchers, engineers and the industry in Türkiye was discussed by the community at the last National Astronomy Congress (Yıldız et al., 2026). We expect that these efforts will lead to a strong radio astronomy community in Türkiye in the coming years.

4. Community and Research Fields

There are approximately 250 researchers with a PhD, 200 graduate students and nearly 1500 undergraduate students in the astronomical community of Türkiye. Most of the active researchers are members of the Turkish Astronomical Society (TAD)[10]. The society currently has 198 regular, 4 institutional and 3 honorary members. National observatories, private educational institutions and some companies which supply astronomical equipment are the institutional members. Undergraduate students are encouraged to follow the society as amateur members. Among the professional astronomers, 75 are members of the International Astronomical Union (IAU) and 99 are members of the European Astronomical Society (EAS).

Since the observational facilities were limited in the past, Turkish astronomers traditionally worked on stellar astrophysics and solar physics (Eker et al., 2013). These fields remain strong today, along with galactic structure, high-energy astrophysics, astrometry, and planetary science. In recent years, however, the number of studies on extragalactic astronomy and cosmology has clearly increased (Eryılmaz & Aliş, 2025). There are several reasons for this: the national telescopes have been modernized, Turkish astronomers are participating in international collaborations and surveys more than before, and many young researchers have returned to the country after their PhD or post-doctoral studies abroad.

The community comes together every two years for the National Astronomy Congresses (Ulusal Astronomi Kongresi, UAK)[11]. This tradition started in 1968. The congresses are the main event of TAD, and each time a different astronomy department hosts the event. The 23rd congress was held at Istanbul University on 2–6 September 2024 with 408 registered participants and 170 contributions. The 24th congress, the most recent one, took place in Erzurum on 24–28 August 2026 and was hosted by the Department of Astronomy and Space Sciences of Atatürk University. There were 200 registered participants and 185 contributions (Figure 4). The congress in Erzurum was a very productive meeting. In particular, the community had the chance to discuss the latest status of the DAG Telescope in detail. Being able to organize a national congress regularly for almost sixty years is something of which our community is proud.

[8] http://ist60.istanbul.edu.tr/mirya/info/
[9] https://uzaybimer.erciyes.edu.tr
[10] https://www.tad.org.tr
[11] https://uak.info.tr



Figure 4. Group photos of the National Astronomy Congresses (UAK). (left) The 23rd congress at Istanbul University, 2–6 September 2024. (right) The 24th congress at Atatürk University, 24–28 August 2026.

5. International Relations and Regional Collaboration

In 2014, Türkiye joined the IAU South West and Central Asia Regional Office of Astronomy for Development (SWCA ROAD)[12], which is hosted by the Byurakan Astrophysical Observatory[13]. The accession was facilitated by TAD and was an important step for scientific relations in the region. Through this office, we work together with our colleagues from Armenia, Georgia, Iran, Kazakhstan and Tajikistan. The common activities are mostly about capacity building, sharing educational resources and building networks for young researchers across the borders.

A good example of this regional approach is the IAU/I-HOW Radio Astronomy Workshop[14]. It was held at Erciyes University, Kayseri, on 4–15 September 2023 with the title "A Joint Iran and Türkiye Hands-on Workshop in Radio Astronomy"[15] (Figure 5). There were 110 applications; 36 of them were accepted and 32 participants from Iran, Türkiye, Iraq, Kazakhstan, Uzbekistan, Georgia and Pakistan attended the workshop. The lectures were given by 11 instructors from well-known radio astronomy institutes. The hands-on sessions on data reduction and analysis were especially useful for the MSc and PhD students. The experience gained in this workshop is also valuable for the TURAG project.



Figure 5. Participants and lecturers of the IAU/I-HOW Radio Astronomy Workshop held at Erciyes University, Kayseri, on 4–15 September 2023.

On the education side, the Mediterranean Regional Shaw-IAU Workshop on Astronomy for Education[16] was hosted by Istanbul Kültür University on 16–20 October 2024[17]. The workshop was organized within the

[12] https://iau-swa-road.aras.am/eng/index.php
[13] https://www.bao.am/index.php
[14] https://www.iau.org/IAU/IAU/Science/Trainings---Workshops/I-HOW-Hands-On-Workshops.aspx
[15] https://ihowradioastro.github.io
[16] https://www.iau.org/IAU/IAU/Science/Trainings---Workshops/OAE-Conference.aspx
[17] https://astro4edu.org/shaw-iau/turkey-2024/

scope of the National Astronomy Education Coordinator (NAEC) team of Türkiye[18]. Teachers, researchers, and science educators from different countries participated and shared their teaching methods, materials, and experiences in astronomy education.

6. Olympiads and Public Outreach

One of the important developments of recent years is the participation of Türkiye in the International Olympiad on Astronomy and Astrophysics (IOAA)[19]. The Turkish Olympiads on Astronomy and Astrophysics (TROAA)[20] were initiated by TAD and are supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK). After the team members are selected, training camps are organized at the campuses of the national observatories and in the astronomy departments of universities. During these camps, the students use the planetariums and telescopes. In the first three participations (Poland 2023, Brazil 2024, and India 2025), the national teams won 3 silver medals, 8 bronze medals, and 2 honorable mentions. At the 19th IOAA, which was held in Vietnam in 2026, our team won 2 silver medals, 2 bronze medals, and 1 honorable mention; in other words, all five students returned with an award. In total, we have reached 5 silver medals, 10 bronze medals, and 3 honorable mentions in only four years. Beyond the medals, we find this program important because talented high-school students encounter astronomy at an early age.

Another important development is that the next olympiad will be organized in Türkiye. During the 19th IOAA in Vietnam, the IOAA flag was handed over to the Turkish delegation in a ceremony, and the 20th IOAA will be held in Türkiye in the summer of 2027. Since countries from many different regions participate in the IOAA, the olympiad in 2027 will be a good occasion to bring students and team leaders from all over the world together.

For the astronomical community in Türkiye, public outreach is as important as research and teaching. Student clubs and professional astronomers in many cities have been organizing public events for many years. The best-known one is the National Sky Festival, which is organized by TÜBİTAK and the Ministry of Industry and Technology (Fişek & Aliş, 2020). It is the largest star party in Türkiye. The festival was held for the 28th time in 2026, and thousands of people from all over the country participate every year (Figure 6).



Figure 6. Group photo from the 28th National Sky Festival. The festival is the largest star party in Türkiye.

7. Space Technologies

Developments in space technology are closely related to the future of astronomy in Türkiye. The TÜBİTAK Space Technologies Research Institute (TÜBİTAK UZAY)[21] designs satellites for different missions, and most of their subsystems are produced in the country. Türkiye already has several satellites in

[18] https://astro4edu.org/naec-network/TR/
[19] https://ioaastrophysics.org
[20] https://olimpiyat.astronomi.org
[21] https://uzay.tubitak.gov.tr/en/

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orbit that are used for telecommunication, broadcasting, and Earth observation. An important point here is that the high-precision mirrors of the Earth observation satellites are also produced in Türkiye. Since such space-grade optics can be adapted for astronomical observations, a Turkish space telescope is being actively discussed among astronomers.

The Lunar Research Program (Ay Araştırma Programı - AYAP) is the best-known goal of the National Space Program[22]. The production, assembly, and integration of the spacecraft (Figure 7) have been completed, and it has been transferred to the national test center for the system-level environmental tests. About 80% of the spacecraft is the product of domestic engineering. The launch of the first mission, AYAP-1, is planned for 2027[23] [24]. The spacecraft will first collect data from lunar orbit and then end its mission with a hard landing on the surface of the Moon. If it is successful, Türkiye will be the 9th country to accomplish a lunar mission.

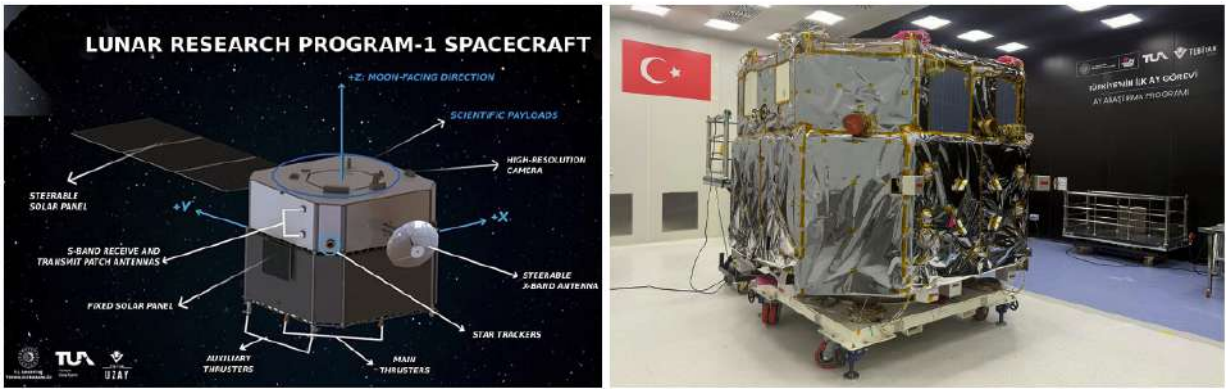

Figure 7. The spacecraft of the Lunar Research Program. (left) Main components of the spacecraft; adapted from the original graphic of the Turkish Space Agency (TUA) and TÜBİTAK UZAY. (right) The spacecraft in the clean room after the completion of its integration. Image: TÜBİTAK UZAY.

Finally, the 77th International Astronautical Congress (IAC 2026) was held at the NEST Congress and Exhibition Center in Antalya from 5 to 9 October 2026, with the theme "The World Needs More Space"[25]. The congress is organized every year by the International Astronautical Federation (IAF)[26], and it took place in Türkiye for the first time under the coordination of the Ministry of Industry and Technology, with the Turkish Space Agency (TUA) and SAHA Istanbul as hosts. A total of 8330 abstracts from 108 countries were submitted to the scientific program. Türkiye contributed 1810 of them, which is the highest number submitted by a single country in the history of the congress; with 674 accepted abstracts, it was also the country with the largest number of accepted contributions. The congress was attended by 7604 delegates from 111 countries, and the total number of visitors reached 18642, including more than 11000 people on the day open to the public. The first lunar mission of Türkiye was presented in a dedicated session. In addition, the "Antalya Declaration for Peace in Space", initiated by Türkiye, was adopted at the meeting of ministers and members of parliament held one day before the congress, with the support of 32 representatives from 21 countries. This level of participation indicates a growing interest in space sciences among universities and the industry in Türkiye, from which astronomy is also expected to benefit.

8. Conclusion

The panorama presented in this paper emphasizes that astronomy in Türkiye is transitioning from a period limited by small telescopes to a period of large national facilities. For many years, the research of Turkish astronomers was shaped by the telescopes that were available, and this is the main reason why stellar and solar studies became the tradition of the community. With the DAG Telescope, faint objects and near-infrared light will be accessible with a national facility for the first time, and the TURAG project is expected to do the same for radio wavelengths. It should be noted, however, that a new telescope alone is

[22] https://tua.gov.tr/en/national-space-program/national-space-program
[23] https://tua.gov.tr/tr/haberler/turkiye-nin-ay-yolculugunda-geri-sayim-basladi
[24] https://uzay.tubitak.gov.tr/en/space-exploration-lunar-research-program/
[25] https://www.iac2026.org/
[26] https://www.iafastro.org/

not enough. Instruments have to be developed and maintained, observing time has to be distributed in a fair and efficient manner, and young astronomers must be trained in the new observing techniques. From this perspective, the establishment of the Türkiye National Observatories as a single research center is as important as the telescope itself. The university observatories will maintain their role in this structure as the students gain their first observational experience there.

The second point is about the people. The growth of the community cannot be explained solely by the new facilities. The National Astronomy Congresses, the workshops organized together with the IAU, the astronomy olympiads, and the public events supported by the Turkish Astronomical Society create an environment in which young people encounter astronomy at an early age and remain in the field. The 20th IOAA, which will be hosted in Türkiye in 2027, is a result of this effort. In our opinion, the continuity of these activities is the most valuable aspect of astronomy in Türkiye because the facilities being built today will be used by the students reached through these activities.

Finally, the developments in space technologies and the collaboration with neighboring countries should be considered together with the points mentioned above. The capability of producing satellites and space-grade optics in the country, along with the upcoming lunar mission, may pave the way for a national space telescope in the long term. On the other hand, joint studies and organizations, such as the workshops and meetings carried out within the IAU SWCA ROAD, bring together astronomers from the region. We expect that such activities will increase in the coming years and that their positive effects will be felt by the communities of all the countries involved.

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