Astronomical Heritage Related Educational and Outreach Activities in Armenia

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Abstract

Astronomical heritage represents an important component of scientific and cultural identity, preserving the achievements, instruments, archives, and intellectual legacy of astronomy. In Armenia, the Byurakan Astrophysical Observatory (BAO) plays a central role in safeguarding this heritage while actively integrating it into modern educational and outreach initiatives. This article presents key educational and outreach activities related to astronomical heritage in Armenia, highlighting programs designed to promote astronomy education, engage the public, and inspire new generations of scientists. Initiatives such as the "From School to Space" lecture series, the Byurakan Science Camp, teacher training workshops, astrojournalism and astrophotography competitions, and digital outreach programs demonstrate how BAO connects historical scientific achievements with contemporary educational practices. Through these initiatives, the observatory continues to strengthen astronomy education, promote scientific communication, and foster international collaboration while preserving Armenia's rich astronomical heritage.

Keywords: *outreach, journalism, astronomy education, scientific literacy.*

1. Introduction

Astronomical heritage encompasses not only historic observatories, instruments, and scientific archives, but also the intellectual traditions and educational efforts that sustain astronomy across generations. Armenia possesses a remarkable astronomical legacy, closely associated with the work of prominent scientists such as Viktor Ambartsumian, founder of the Byurakan Astrophysical Observatory.

The Byurakan Astrophysical Observatory (BAO) has long served as one of the leading scientific institutions in the region, contributing significantly to astrophysical research and international scientific collaboration. At the same time, BAO plays a vital role in promoting astronomy education and public engagement. The observatory's mission therefore includes a dual responsibility: conducting scientific research while actively preserving and promoting astronomical heritage through educational and outreach activities.

This article presents several major initiatives that illustrate how astronomical heritage in Armenia is preserved, communicated, and transformed into a dynamic educational resource.

List of Astronomical Heritage in Armenia

- Calendars: in Matenadaran manuscripts, etc.
- Rock Art
- Ancient Observatories: Zorats Karer, Metzamor, etc.
- Ancient and Medieval astronomy-related records: Tigranes the Great coin, SN 1054, etc.
- Medieval sky maps
- Astronomical Instruments: astrolabe, etc.

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- BAO as astronomical and cultural heritage
- Scientific (Astro) Tourism sites
- BAO Plate Archive; 37,500 photographic plates
- Markarian Survey as UNESCO "Memory of the World" Documentary Heritage
- Viktor Ambartsumian House-Museum
- Museum of History of the Armenian Astronomy

2. Institutional Framework for Astronomy Outreach

Educational and outreach activities related to astronomical heritage in Armenia are coordinated through collaboration between several institutions.

The Byurakan Astrophysical Observatory hosts the International Astronomical Union (IAU) South-West and Central Asia Regional Office of Astronomy for Development (SWCA ROAD), which supports regional astronomy education and public engagement programs. These initiatives aim to strengthen astronomy development across neighboring countries and promote international scientific cooperation.

Another key organization is the Armenian Astronomical Society (ArAS), founded in 1999 by members of the Armenian astronomical community. The society works to promote astronomical research, education, and outreach within Armenia while fostering connections with astronomers worldwide. Through publications, conferences, and community initiatives, ArAS plays an important role in strengthening the national astronomy network.

Figure 1. ARAS logo

3. Educational Programs and Outreach Initiatives

3.1. The "From School to Space" Lecture Series

One of the most impactful outreach initiatives is the **"From School to Space"** lecture series, launched in 2012. The program was developed partly in response to the absence of astronomy in Armenia's school curriculum.

Scientists and educators travel to schools across the country—including remote and rural regions—to present lectures, demonstrate telescopes, and introduce students to astronomical discoveries. Over more than a decade, the program has reached thousands of students and provided many young people with their first direct exposure to modern astronomy (Figure 2).

Figure 2. From School to Space.

3.2. Byurakan Science Camp

The Byurakan Science Camp, launched in 2014, is designed for schoolchildren aged 11–14. The program provides participants with a week-long immersive experience at the observatory.

Students take part in hands-on experiments, workshops, and observational activities guided by professional astronomers. Evening stargazing sessions allow participants to observe celestial objects directly through telescopes, while excursions integrate scientific learning with Armenia's cultural and natural heritage.

The camp has become one of BAO's most successful educational initiatives, creating an inspiring environment that encourages young people to explore science and research careers (figure 3).

3.3. Teacher Training Programs

Recognizing the crucial role of educators in science communication, BAO launched teacher training workshops in 2024. These programs aim to strengthen astronomy education in Armenian schools by providing teachers with modern teaching methods and updated scientific knowledge. The workshops combine theoretical lectures with practical activities such as astronomical observations, field visits, and problem-solving exercises. By empowering teachers with new educational tools, the program indirectly reaches thousands of

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Figure 3. Byurakan Science Camp.

students throughout the country (Figure 4).

4. Educational Resources and Scientific Communication

4.1. The Astronomical Dictionary

One of BAO's important educational tools is the Astronomical Dictionary, a trilingual resource available in Armenian, English, and Russian. The dictionary includes astronomical terminology, object names, and star names, helping students, educators, and the general public navigate the complex vocabulary of astronomy.

This resource plays an essential role in supporting astronomy education by providing accurate and standardized terminology accessible to a broad audience.

4.2. ArAS Electronic Newsletter

The ArAS Electronic Newsletter serves as an important platform for scientific communication within the Armenian astronomical community. Published regularly by the Armenian Astronomical Society, the newsletter disseminates information about scientific achievements, conferences, educational initiatives, and astronomy-related events.

By connecting researchers, educators, and enthusiasts both nationally and internationally, the newsletter strengthens collaboration and ensures that developments in Armenian astronomy remain visible within the global scientific community (Figure 5).

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Figure 4. Teacher Training Programs

5. Science Communication and Public Engagement

5.1. Astrojournalism Competition

The Astrojournalism Competition was created to bridge the gap between science and society. The initiative encourages journalists and science communicators to present astronomical topics in accessible language for the general public.

Through this competition, participants develop skills in scientific communication while promoting public understanding of astronomy and highlighting local scientific achievements.

5.2. Astrophotography Competition

The Astrophotography Competition combines scientific observation with artistic creativity. By capturing images of celestial objects and astronomical phenomena, participants contribute to public appreciation of the beauty of the Universe. Such visual representations often communicate complex scientific ideas more effectively than written descriptions, making astrophotography an important tool for science outreach (Figure 6).

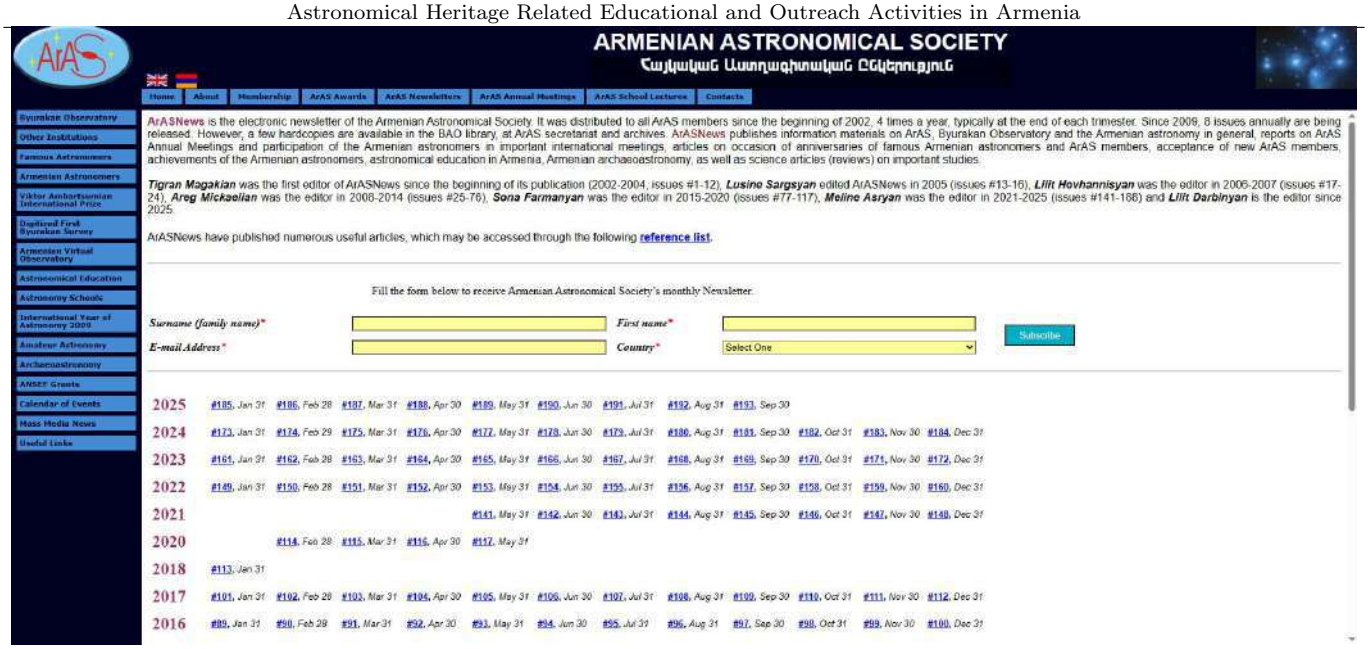

Figure 5. ArAS Electronic Newsletter

Figure 6. Byurakan Astrophysical Observatory and Mount Ararat.

6. Astrotourism and Digital Outreach

The Byurakan Astrophysical Observatory has also become one of Armenia's most significant astrotourism destinations. Each year, thousands of visitors—including students, tourists, and astronomy enthusiasts—visit the observatory to explore its telescopes, scientific history, and unique astronomical environment.

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In addition, BAO actively uses social media platforms such as Facebook and Instagram to share astronomy news, educational materials, and updates about observatory activities. Digital outreach allows the institution to reach global audiences and engage individuals who cannot visit the observatory in person.

7. Conclusion

Astronomical heritage in Armenia represents a valuable intersection of scientific history, cultural identity, and educational development. Through the initiatives of the Byurakan Astrophysical Observatory and the Armenian Astronomical Society, this heritage is actively preserved and transmitted to new generations.

Programs such as science camps, teacher training workshops, lecture series, and science communication competitions demonstrate how historical scientific achievements can be transformed into dynamic educational experiences. By combining tradition with innovation, Armenia continues to strengthen astronomy education and inspire curiosity about the Universe.

The experience of BAO illustrates how scientific institutions can successfully integrate research, heritage preservation, and public engagement to build a sustainable future for astronomy education.

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