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ARMENIAN ASTRONOMICAL SOCIETY

ArAS Newsletter

EDITOR: LILIT DARBINYAN

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LOCAL NEWS

ArASNews NEW EDITOR

We are pleased to introduce **Lilit Darbinyan** as the new Editor of *ArASNews*, beginning with this issue (#189). Lilit has been actively involved in astronomy communication and outreach since 2018. She manages the social media platforms of both the Byurakan Astrophysical Observatory (BAO) and the Armenian Astronomical Society (ArAS), promoting Armenian astronomy to broader audiences.


Lilit Darbinyan

Lilit holds an M.Sc. in Pharmacy and Chemistry from Yerevan State University, where she graduated in 2020. Her academic background, combined with a growing interest in astrochemistry, bridges the gap between natural sciences and astronomy.

Since September 2024, Lilit has taken on the responsibility of preparing BAO's press releases and daily news. She has also contributed significantly to the *ArAS School Lectures* program and participated in many key events organized by BAO.

From 2021 up to now, she serves as Armenia's **National Outreach Coordinator (NOC)** for the International Astronomical Union's Office of Astronomy Outreach (IAU OAO), helping to foster public interest in astronomy through innovative outreach activities. In addition, she is involved in the IAU's global network of **National Astronomy Education Coordinators (NAECs**), contributing to international efforts to improve astronomy education.

Her dedication to astronomy communication has earned her the opportunity to participate in the **European Astronomical Society Annual Meeting**, to be held in Cork, Ireland (June 23–27, 2025), where she will give a contributed talk on **"Innovative Strategies for Public Engagement and Scientific Literacy."**

We wish her great success in this important role of connecting Armenian astronomy with the global community. We also extend our thanks to all previous editors who have contributed to the growth of this newsletter.

Editors	Years	Issues
Tigran Magakian	2002-2004	1-12
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Areg Mickaelian,
ArAS Acting President

XVII Joint Byurakan-Abastumani (Armenian-Georgian) Astronomical Colloquium

On May 5, 2025, the official opening ceremony of the XVII Joint Byurakan-Abastumani (Armenian-Georgian) Astronomical Colloquium— already a well-established tradition — took place at the Byurakan Astrophysical Observatory (BAO).

Colloquium participants, 2025

Welcome speeches were delivered by BAO Director Areg Mickaelian, Abastumani Observatory Deputy Director Teimuraz Kvernadze, as well as Professor Pedro Russo from Leiden University and Georgian Professor Otar Kvaratskhelia. The opening ceremony was followed by the first session of the colloquium.

The colloquium sessions cover a variety of topics, including Solar Physics, Stars and Nebulae, Galaxies and Cosmology, as well as Theoretical Astrophysics.

The scientific collaboration and friendship between the Armenian and Georgian astronomers were established since 1930s due to Viktor Ambartsumian's (1908-1996) and Evgeni Kharadze's (1907-2001) efforts. Ambartsumian, working at that time at the Leningrad State University (LSU), several times visited the Abastumani Astrophysical Observatory (AbAO) founded in 1932 as a scientific adviser. The famous Georgian astronomers Mikhail Vashakidze and Shalva Gordeladze were Ambartsumian's PhD students at LSU and a number of important results were published resulting in PhD theses in 1936 and 1937, respectively. In 1946, the Byurakan Astrophysical Observatory (BAO) was founded and the collaboration was continued at a new level.

Collaboration between the Byurakan Astrophysical Observatory and the Institute of Geophysics and Engineering Seismology continues

On April 30 of this year, Areg Mickaelian, Director of the Byurakan Astrophysical Observatory (BAO) named after V. Ambartsumian of NAS RA, visited the Institute of Geophysics and Engineering Seismology (IGES) named after A. Nazarov of NAS RA, at the invitation of its Director, Jon Karapetyan.

Areg Mickaelian & Jon Karapetyan at IGES, 2025

A. Mickaelian was introduced to the activities carried out within the framework of Armenian-Chinese cooperation and the data collection center for newly installed ultra-sensitive seismic stations in Armenia. Notably, one of these stations is located directly at the BAO.

During the visit, opportunities for collaboration in the fields of astronomy and geophysics were discussed. These include areas such as asteroseismology, the study of meteorites, and planetary science (or planetology).

The parties agreed to sign a memorandum of cooperation in the near future, which will promote the exchange of scientific data and the implementation of joint research by combining scientific capacities.

As one of the leading scientific centers in the region, the Byurakan Astrophysical Observatory emphasizes the importance of interdisciplinary collaborations.

Scientific Article by Gagik Ter-Kazarian Published in *Gravitation and Cosmology* Journal

A scientific article authored by Gagik Ter-Kazarian, Chief Researcher at the Byurakan Astrophysical Observatory (BAO) has been published in the journal Gravitation and Cosmology:

"On the Kinetic Recession Velocities of Astronomical Objects" (G. Ter-Kazarian, Gravitation and Cosmology, 2022, Vol. 28, No. 2, pp. 186–195).

Gagik Ter-Kazarian

In this work, the author defines and calculates the true, "kinetic" recession velocity of astronomical bodies, which, regardless of the redshift value of these bodies, always remains below the speed of light in vacuum.

In this context, the fundamental principle of causality in physics is no longer violated. He also calculates another physically significant parameter: the portion of the motion of astronomical bodies that is due to the expansion of the Universe.

"The fundamental problem described above, which is essential for astronomy, is actually a particular case of a more general and complex 'classical' problem in physics — calculating the relative velocity of bodies in curved spacetimes. This issue has remained one of the most important unsolved problems in Einstein's General Theory of Relativity since 1915," said Ter-Kazarian.

"The challenge lies in the fact that the curvature of space makes it essentially impossible to perform the so-called 'parallel transport' of a velocity vector within that space — a step required to define relative velocity. In 2023, I overcame this difficulty and solved the general problem for any Riemannian space," he added.

He published this work in a second article in the Gravitation and Cosmology journal:

"Coordinate-Independent Definition of Relative Velocity in Pseudo-Riemannian Space-Time: Implications for Special Cases" (G. Ter-Kazarian, Gravitation and Cosmology, 2023, Vol. 29, No. 1, pp. 62–73)

You can read the article with the following link.

Cooperation between all Armenian Astronomical and Space Organizations

On May 27, 2025, at the initiative of the Armenian Astronomical Society (ArAS), a working meeting was held at the Byurakan Astrophysical Observatory (BAO). The meeting brought together Armenian astronomical organizations and specialists involved in astronomy, space science, and space engineering.

Meeting participants at BAO's UNESCO Centre

The purpose of the meeting was to discuss opportunities for cooperation, implementation of joint projects, and formats for experience exchange to promote the consolidation of scientific and engineering potential in Armenia.

During the discussions, participants presented the main directions of their activities, ongoing projects, and their vision for future collaboration. The meeting aimed to strengthen connections between sectoral organizations at the national level, pool innovative ideas, and coordinate unified efforts effectively.

As a result, it was decided to continue these discussions in a similar format and to establish a working platform for information exchange, joint events, and the implementation of scientific initiatives.

Seminar on Pulsars and Millisecond Pulsars Delivered at Byurakan Astrophysical Observatory

The Byurakan Astrophysical Observatory (BAO) hosted a scientific seminar featuring Dr. Maria Rah, a researcher affiliated with BAO and the Silk Road Project at the National Astronomical Observatories of China (NAOC).

The seminar, titled **"From Identifying Gaps to Simulating Evolution: A Comprehensive Study of Pulsars and Millisecond Pulsars"** took place on 29 May, 2025.

Dr. Rah presented a thorough investigation into the complex life cycles of pulsars and millisecond pulsars, beginning with a critical identification of existing knowledge gaps regarding their formation and evolutionary processes.

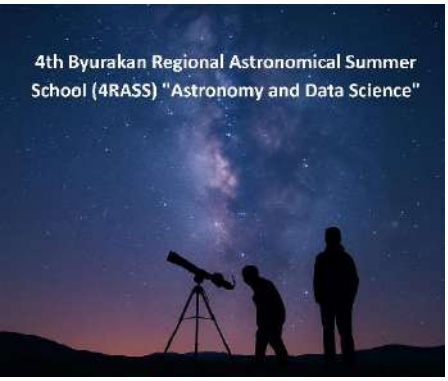
Maria Rah at BAO, 2025

The seminar underscored the urgent need for advanced modeling and numerical simulations to better understand these phenomena.

Dr. Rah detailed the evolutionary mechanisms, including dipole radiation, mass accretion, neutron star mergers, and magnetic field decay, explaining how factors such as binary status and accretion rates govern the transformation of ordinary pulsars into millisecond pulsars.

ANNOUNCEMENTS

IV Regional Astronomical Summer School (4RASS)



4RASS will take place at Byurakan Astrophysical Observatory on September 8-12, 2025. During the school the students will have observations on 1 or 2.6 m telescopes, practical tutorial sessions on data reduction and analysis, statistics, as well as will get knowledge about the Astronomical Surveys, Databases, Archives and Virtual Observatory tools. The Regional Schools are related to the IAU South West and Central Asian Regional Office of Astronomy for Development (SWCA ROAD) hosted by Armenia since 2015.
All local expenses for the school will be covered by the organizers. We can offer a limited number of travel grants for students from South West and Central Asia Regional Office of Astronomy for Development (SWCA ROAD) member countries and few more grants to other nationality students.

Follow the link for more details and registration:
IV Regional Astronomical Summer School (4RASS)

International Symposium "Astronomical Surveys and Big Data 3" (ASBD-3) dedicated to 20th anniversary of ArVO foundation

The International Symposium ASBD-3 will take place on 15-19 September 2025 in the Byurakan Astrophysical Observatory (BAO), Armenia and will be dedicated to the 60th anniversary of Markarian Survey (First Byurakan Survey, FBS, included in UNESCO Documentary Heritage *"Memory of the World"* International Register in 2011) and the 20th anniversary of the Armenian Virtual Observatory (ArVO, member of the International Virtual Observatory Alliance, IVOA).

ASBD-3 will contribute to the following:

- Review and discuss large astronomical surveys to summarize observational data obtained in astronomy
- Give tribute to Markarian Survey and other important surveys
- Review and discuss astronomical catalogues, databases and archives
- Learn about major current and upcoming surveys (including Euclid, Rubin, etc.)
- Learn and discuss how large observational data sets are changing astronomy
- Introduce tools and techniques for working with large data sets (including access, data mining, analysis, visualization, etc.)
- Discuss the future of astronomical research by joint efforts of astronomers and computer scientists

Follow the link for more details and registration:
Astronomical Surveys and Big Data 3 (ASBD-3)

International Conference Astronomical Heritage of the Middle East 2 (AHME-2)

The AHME-2 will take place on 6-10 October 2025 in the Byurakan Astrophysical Observatory (BAO), Armenia. This will be the 2nd such meeting; we had a very successful meeting AHME in 2017 with participation of astronomers and many other specialists. This way we make these meetings regular for BAO and Armenia, as Armenia is one of the cradles of Astronomical Heritage, as well as BAO hosts a UNESCO *"Memory of the World"* Documentary Heritage (Markarian Survey).

The AHME-2 meeting will contribute to the following:

- Review and discuss Astronomical Heritage of the Middle East to summarize available data
- Review and discuss individual items of Astronomical Heritage
- Learn about related major current and upcoming projects and studies
- Learn and discuss how Astronomical Heritage can change our understanding of the history
- Discuss access, data mining, analysis, visualization, etc. related to Astronomical Heritage
- Discuss the future of studies by joint efforts of Astronomers, Historians, Archaeologists, and other experts
- Discuss and homogenize the presentation of available information in webpages, etc.

During the Conference, an Astronomical Festival (AstroFest-2025) will be organized on 8 October, where dozens of scientists, students and others will visit BAO and meet scientists, writers and poets, composers and artists. All participants will be invited to participate.

Follow the link for more details and registration:
International Conference Astronomical Heritage of the Middle East 2 (AHME-2)

INTERNATIONAL NEWS

May 7 is Celebrated as International Planetarium Day

On May 7 International Planetarium Day is being celebrated worldwide, marking the 100th anniversary of their creation.

Previously observed in March, International Planetarium Day has been moved to May 7 starting from 2024, to coincide with the 100th anniversary of the establishment of the first planetarium.

The first planetarium was opened on May 7, 1925, in Jena, Germany, by the Carl Zeiss company, ushering in a new era for science and public education.

Planetariums have become important centers for science outreach, offering astronomical shows, educational programs, and public observations.

John Richard Bond and George Efstathiou receive the 2025 Shaw Prize in Astronomy

The Shaw Prize in Astronomy 2025 is awarded in equal shares to John Richard Bond, Professor of the Canadian Institute for Theoretical Astrophysics and University Professor at the University of Toronto, Canada and George Efstathiou, Professor of Astrophysics at the University of Cambridge, UK for their pioneering research in cosmology, in particular for their studies of fluctuations in the cosmic microwave background. Their predictions have been verified by an armada of ground-, balloon- and space-based instruments, leading to precise determinations of the age, geometry, and mass-energy content of the Universe.

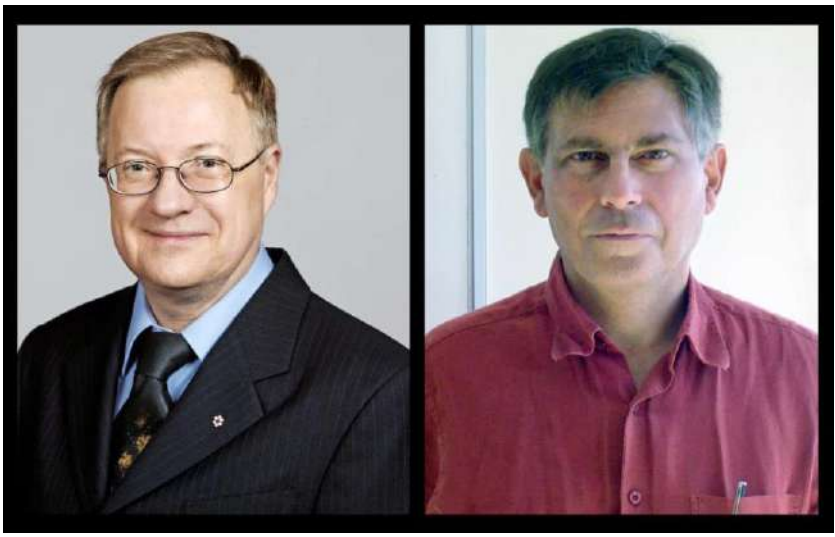


Photo of John Richard Bond (left) and George Efstathiou (right), Shaw Prize in Astronomy 2025. Image Credits: Gruber Foundation, Yale University and University of Cambridge, Twitter/X.

Both Bond and Efstathiou have worked closely with experimentalists to bring their predictions to the test: they have been heavily involved in the analysis of cosmic microwave background data arising from a wide variety of experiments of growing sophistication and accuracy.

The Shaw Prize is also intended to recognise Bond and Efstathiou's other contributions to cosmology. Bond and his collaborators introduced the concept of the "cosmic web", the network of filaments and sheets that connects individual galaxies to larger structures such as groups and clusters of galaxies, developed the mathematical theory of the statistics of peaks of Gaussian random fields that underlies our understanding of clustering of galaxies in the Universe, and made fundamental contributions to our understanding of primordial non-Gaussianity arising during the inflationary phase of the early Universe. More generally, their research touches on almost every aspect of modern cosmology and has made fundamental contributions to the establishment of the standard cosmological model.

For more information visit to the following link.

Ryan Cooke and Max Pettini received Gruber Cosmology Prize 2025

The 2025 Gruber Cosmology Prize recognizes Ryan Cooke and Max Pettini both for their determination of a key value in the composition of the universe moments after it came into existence and for perfecting the method that allowed them to make that measurement.

Cooke and Pettini will equally share the $500,000 award and each will receive a gold laureate pin at a ceremony that will take place later this year. The citation honours them for *"bringing the light element abundances and Big Bang Nucleosynthesis (BBN) into the realm of precision cosmology."*

Photo of Ryan Cooke (left) and Max Pettini (right) the 2025 Gruber Cosmology Prize Winners.
Credit: IAU / The Gruber Foundation

What's more, their measurement of the baryon density is in excellent agreement with the percentage derived via a separate method of identifying the composition of the universe. Whereas the BBN method examines the Universe when it was just a few minutes old, the alternative method looks at the Universe 378,000 years later, when the first light in the Universe left an all-sky lasting imprint upon space—what cosmologists call the Cosmic Microwave Background, or CMB. (The principal investigators of, and the teams behind, three successive and increasingly precise measurements of the CMB received Gruber Cosmology Prizes in 2006, 2012, and 2018.)

In 2018, Cooke and Pettini (with assistance from Charles Steidel, recipient of the 2010 Gruber Cosmology Prize) published the results from a sample of seven quasars, all of which agreed (within the margin of error) on the D/H ratio. That ratio in turn allowed them to calculate that baryons constitute about 5 percent of the mass-energy density of the Universe—a result that not only closely matched the results from the CMB method but validated the BBN method as a tool for performing precision cosmology.

For more information visit to the following link.

ANNIVERSARIES

Rafik Vardanyan's 90th Anniversary

May 20, 2025, marked the 90th anniversary of the birth of the distinguished Armenian astronomer Rafik Vardanyan, one of the pioneering scientists of the Byurakan Astrophysical Observatory (BAO).

Rafik Vardanian

A commemorative seminar was held on May 22 at BAO, honoring his scientific achievements and lasting legacy. The seminar featured a talk by Hayk Harutyunyan, Head of the "Non-Stable Phenomena" research department at BAO, who reflected on Vardanyan's life, contributions, and enduring impact on the development of astronomy in Armenia.

Rafik Vardanyan was born on May 20, 1935, in the village of Tegh in the Goris region of Armenia. He graduated from the Faculty of Physics at Yerevan State University (YSU) in 1958 and began his career at BAO even earlier, in 1957, as a student.

Between 1964 and 1966, he pursued postgraduate studies and, in 1967, defended his PhD under the supervision of Karlos Grigoryan. He later earned his Doctor of Science degree in 1986 and was named Senior Researcher in 1995.

Vardanyan's name is closely linked with the earliest polarimetric observations at BAO and the formation of the observatory's Practical Astronomy Group. His scientific work primarily focused on polarimetric studies and the investigation of galaxy groups. He conducted detailed research on variable stars (including Mira-type, Cepheids, T Tauri-type, and flare stars), interstellar extinction, Markarian galaxies, quasars, radio galaxies, and compact galaxies.

Over his distinguished career, he authored around 100 scientific papers in prestigious journals, including *Astrophysics*, *Kinematics and Physics of Celestial Bodies*, *IBVS*, *Variable Stars*, *Astronomical Circular*, and *BAO Communications*. His research significantly advanced the understanding of the Universe's structure, galaxy evolution, and star formation processes.

Rafik Vardanyan passed away on February 14, 2000, in Byurakan, while still actively engaged in research. His legacy remains influential in contemporary astronomical studies in Armenia and beyond

OBITUARY

Former President of the NAS RA Radik Martirosyan Passed Away

With deep sorrow, we announce that on May 5, 2025, distinguished radio physicist, skilled organizer of science and education, Academician of the National Academy of Sciences of Armenia (NAS RA), Foreign Member of the Russian Academy of Sciences, Doctor of Physical and Mathematical Sciences, and Professor Radik Martirosyan passed away at the age of 89.

Radik Martirosyan was born on May 1, 1936, in the village of Mataghis, Martakert region of the Karabakh.

From 1943 to 1953, he studied at the secondary school of Mataghis. In 1958, he graduated with honors from Yerevan State University, earning a degree in astrophysics.

He began his professional career in 1958 as a junior researcher at the Byurakan Astrophysical Observatory. In 1960, he moved to the Institute of Radiophysics and Electronics.

From 1960 to 1964, he pursued postgraduate studies at the P.N. Lebedev Physical Institute of the USSR Academy of Sciences in Moscow.

His scientific worldview was shaped during those years under the mentorship of Nobel Laureate and Academician Alexander Prokhorov. Martirosyan conducted notable scientific research aimed at creating quantum amplifiers and became one of the pioneers in their application in radio astronomy. The quantum amplifier he developed for the 21 cm wavelength was the first of its kind to be used in Soviet radio astronomy.

ArAS News is the electronic newsletter of the Armenian Astronomical Society. It was distributed to all ArAS members from the beginning of 2002, 4 times a year, typically at the end of each trimester. In 2009-2014, 8 issues annually and since 2015, 12 issues annually have been released.

ArASNews publishes information materials on ArAS, Byurakan Astrophysical Observatory and the Armenian astronomy in general, reports on ArAS Annual Meetings and participation of the Armenian astronomers in important international meetings, articles on occasion of anniversaries of famous Armenian astronomers and ArAS members, acceptance of new ArAS members, achievements of the Armenian astronomers, astronomical education in Armenia, Armenian archaeoastronomy, as well as science articles (reviews) on important studies.

So, if you want to share your studies with the scientific community, send us your articles to lilit.darbinyan7@gmail.com. They will be reviewed for the publication in ArAS Newsletters next issues.

ArAS Newsletter issues are available online with the following link.