Issue 142/ June 2021

ARMENIAN
ASTRONOMICAL SOCIETY

ArAS Newsletter

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LOCAL NEWS

Byurakan Astrophysical Observatory Received the Highest Award of the National Academy of Sciences of the Republic of Armenia

On 11 June, Presidium members of the National Academy of Sciences of the Republic of Armenia (NAS RA) visited the Byurakan Astrophysical Observatory (BAO) on the occasion of BAO's 75th anniversary. Among the honorary guests there were NAS RA president Radik Martirosyan, Vice-president Yuri Shoukourian, NAS RA Academician-Secretary Hrant Matevosyan and Academician-Secretaries of the Divisions.

Prior to the meeting with the BAO director Areg Mickaelian, NAS RA presidium members visited BAO's pantheon to commemorate founder Viktor Ambartsumian's memory. Then they had the opportunity to visit Viktor-Ambartsumian house-museum, ZTA-2.6m telescope, the largest observational instrument of BAO, and were introduced to the telescope's activity.

NAS RA President Radik Martirosyan and BAO Director Areg Mickaelian

During the second part of their visit, they had a meeting with Areg Mickaelian, at which the events dedicated to the BAO's 75th anniversary were introduced (https://www.bao.am/activities/events/2021/2021.php), as well as BAO and NAS RA collaboration and BAO current activities were discussed. The meeting was followed by the award ceremony. Presidium members granted BAO Commemorative medal, the Highest award of the NAS RA as the appreciation of BAO's past and current activities. At the end of the meeting, the Presidium members left their notes in the guest book.

Armenian Scientific Researchers of High Productivity Announced

On 11 June, Science Committee of the Republic of Armenia announced the names of high productivity scientific researchers that were involved in scientific, scientific and technical activities or themes sponsored by the RA budget.

154 research topic supervisors were chosen, as a result of the competition.

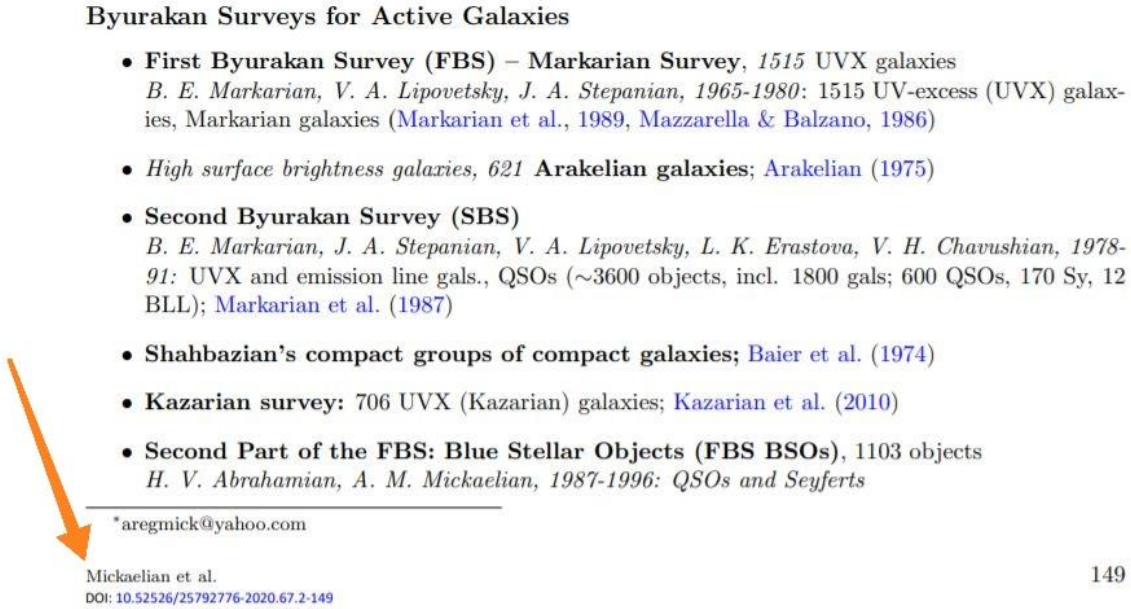
We are happy to announce, that among the winners were also the Byurakan Astrophysical Observatory's leading researcher Areg Mickaelian and junior researcher Naira Azatyan.

Naira Azatyan and Areg Mickaelian

It should be noted, that unlike previous years, this year's competition was among all the age groups. For that purpose, 3 passing thresholds were set to summarize the competition results: those under 35 who managed to pass the 1st threshold will receive 75k AMD per month, those under 45 who passed the 2nd threshold will receive 100k AMD a month while for the 3rd threshold, which implies 135k AMD/a month, there's no age limitation. The sponsorship will be received from June and for 1-year period.

"ComBAO" Papers Received Digital Object Identifier Numbers

NAS RA Byurakan Astrophysical Observatory (BAO) has signed an agreement with National library of Armenia, according to which the Library will provide BAO with services to join the CrossRef, an official Digital Object Identifier (DOI) Registration Agency of the International DOI Foundation.



Byurakan Surveys for Active Galaxies

- **First Byurakan Survey (FBS) – Markarian Survey**, *1515* UVX galaxies
  B. E. Markarian, V. A. Lipovetsky, J. A. Stepanian, 1965-1980: 1515 UV-excess (UVX) galaxies, Markarian galaxies (Markarian et al., 1989, Mazzarella & Balzano, 1986)
- *High surface brightness galaxies, 621* **Arakelian galaxies**; Arakelian (1975)
- **Second Byurakan Survey (SBS)**
  B. E. Markarian, J. A. Stepanian, V. A. Lipovetsky, L. K. Erastova, V. H. Chavushian, 1978-91: UVX and emission line gals., QSOs (∼3600 objects, incl. 1800 gals; 600 QSOs, 170 Sy, 12 BLL); Markarian et al. (1987)
- **Shahbazian's compact groups of compact galaxies;** Baier et al. (1974)
- **Kazarian survey:** 706 UVX (Kazarian) galaxies; Kazarian et al. (2010)
- **Second Part of the FBS: Blue Stellar Objects (FBS BSOs)**, 1103 objects
  H. V. Abrahamian, A. M. Mickaelian, 1987-1996: QSOs and Seyferts

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Mickaelian et al. 149
DOI: 10.52526/25792776-2020.67.2-149

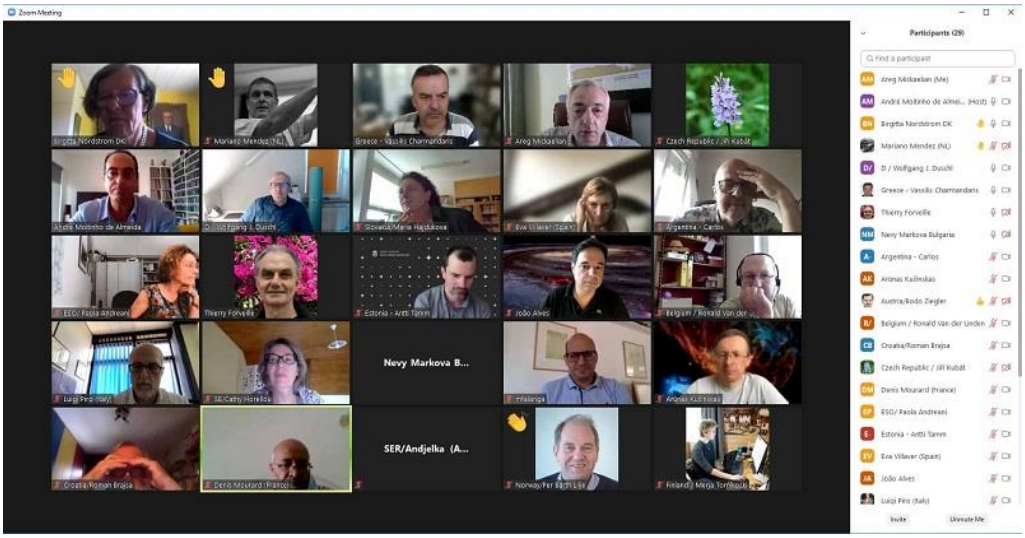
This implies that BAO has become a member of PILA (Publishers International Linking Association) as a library-sponsored organization, while the Communications of the Byurakan Astrophysical Observatory (ComBAO) papers starting from 2017 will have corresponding DOI numbers, which will facilitate their search.

All DOI numbers are available at ADS system (Astrophysics Data System).

Astronomy & Astrophysics Board of Directors Meeting 2021

On 17 June, European well-known “Astronomy & Astrophysics” Journal (A&A) Board of Directors meeting took place, at which the journal policy and editor’s activities, as well as other questions were discussed,

As it was earlier announced, the meeting should have been held in Armenia, however, because of COVID-19 it was again shifted to a virtual meeting, deciding on Armenia being the host of the 2022 board meeting.



Screenshot of the A & A Board of Directors Meeting 2021

It is interesting to note, that A&A is one of the 4 most important astronomical journals in the world, the other 3 being Astrophysical Journal (ApJ), Astronomical Journal (AJ) and Monthly Notices of the Royal Astronomical Society (MNRAS).

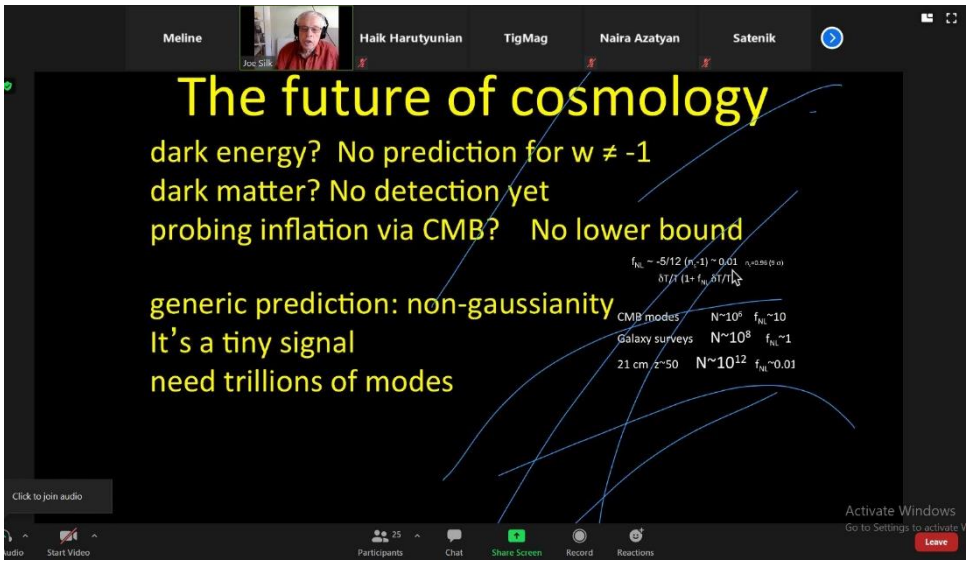
A&A member countries are Austria, Armenia, Belgium, Bulgaria, Germany, Denmark, Estonia, Spain, Italy, Poland, Croatia, Greece, Hungary, Lithuania, Netherlands, Norway, Sweden, Switzerland, Czech Republic, Portugal, Serbia, Slovak Republic, Ukraine, Finland, France, as well as European Southern Observatory and Argentina, Chile that joined recently.

International Seminar-month at the Byurakan Astrophysical Observatory

June was full of virtual seminars that were organized within a series of seminars launched by the Byurakan Astrophysical Observatory (BAO) in 2021. As was mentioned in the previous ArAS news issue, these are scientific, review, technical, report and informational seminars held every Monday and Thursday by not only BAO but also other, foreign scientists.

The Future of Cosmology: Seminar by Balzan Prize Winner Joseph Silk

On 14 June, the BAO hosted a seminar by Balzan Prize and Gruber Prize winner Joseph Silk. In his report, he pointed that one of the greatest challenges in cosmology is understanding the origin of the structure of the universe. The cosmic microwave background and large-scale surveys of galaxies have provided unique windows for probing cosmology and its inflationary origin. Silk argued that the ultimate goal for our future strategy must be astronomy from lunar-based telescopes.



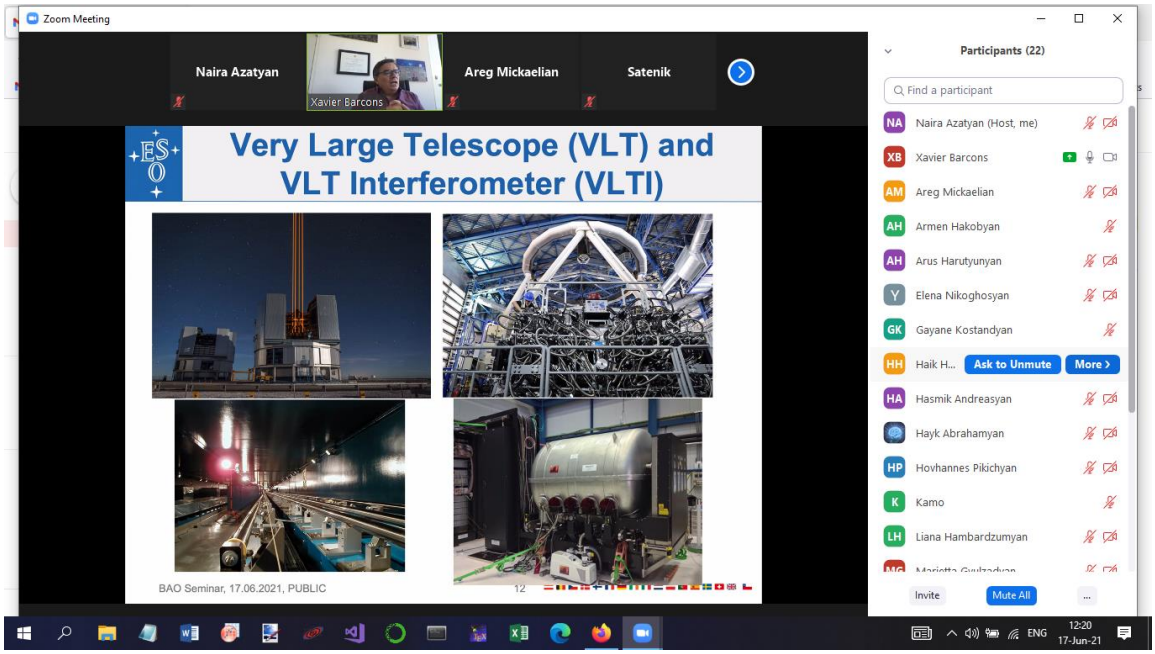
Screenshot of the virtual seminar by Joseph Silk

At present, diffusion damping, one of the 2 effects by which the structure of CMB anisotropies is principally determined, is also called collisionless or Silk damping. Silk has over 900 publications, of which 3 have been cited over 1000 times, over 50 have been published in Nature and 12 in Science. He has received Balzan Prize (2011), Gruber Prize in Cosmology (2019), Royal Society Bakerian Medal (2007) and Gold Medal of the Royal Astronomical Society (2008). He is an Emeritus Fellow of New College (Oxford), a Fellow of the Royal Society, Viktor Ambartsumian Prize SC member, etc..

Seminar by Xavier Barcons, ESO Director General

On 17 June, there was the second international seminar held at BAO.

Xavier Barcons, Director general of the European Organisation for Astronomical Research in the Southern Hemisphere (ESO) presented a report, titled “ESO: Building and operating the most powerful ground-based astronomical observatories” at BAO virtual seminar.



Screenshot of Seminar by Xavier Barcons

In his report, Prof. Barcons identified ESO as the lead world-wide organisation in building and operating most powerful ground-based astronomical observatories. According to the speaker, the success of the organisation relies on the support of its member states and the cooperation with the community, among other key factors. He mentioned that over 3000 refereed papers are published every year using data from ESO facilities, with an increasingly larger fraction of these data coming from the archive. Among these scientific outcomes, there are several directly linked to Nobel Prize awards, that ESO has supported.

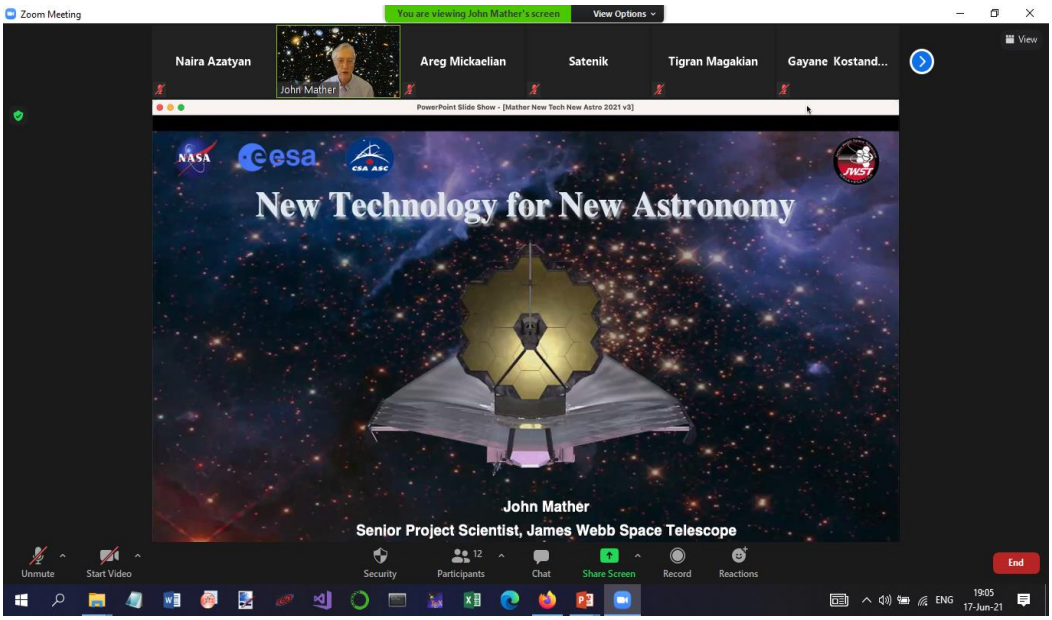
He also reviewed the current status and future perspectives of ESO programmes, underlining science and instrument development opportunities in the coming years as well as societal benefits of ESO’s activities.

Seminar by Nobel Prize and Gruber Prize Winner John Mather

On 17 June, astrophysicist and cosmologist John Mather presented a seminar, titled “New Technologies for New Astronomy”. The speaker is a Nobel Prize laureate in Physics (2006) for his work on the Cosmic Background Explorer Satellite (COBE), he has also received Heineman Prize for Astrophysics (1993), Gruber Prize in Cosmology (2006). J. Mather works at NASA Goddard Space Flight Center (GSFC) in Maryland and is an adjunct professor of physics at the University of Maryland College of Computer, Mathematical, and Natural Sciences. It should be noted that in 2007, Mather was listed among Time magazine's 100 Most Influential People in the World. In October 2012, he was listed again by Time magazine in a special issue on New Space Discoveries as one of 25 most influential people in space.

It’s not his first-time collaboration with BAO, he visited Armenia in 2004 and participated in ArAS annual meeting.

In his report, Mather mentioned, that on the ground, a new generation of optical telescopes is under construction (up to 39m in diameter). Adaptive optics compensates for the turbulent atmosphere, but could work far better with an orbiting reference beacon in space.



Screenshot of the virtual seminar by John Mather

Meline Asryan

Ancient Observatory-Monument Zorats Karer: the Results of Measurements

On 18 June, a meeting was organized at the National University of Architecture and Construction of Armenia where the results of measurements carried out in Zorats Karer (Qarahunj) ancient observatory-monument were introduced from the architectural perspective.

A meeting on Zorats Karer (Qarahunj) ancient observatory-monument

The above-mentioned measurements were conducted in the scope of the cooperation between the Byurakan Astrophysical Observatory (BAO) and the National University of Architecture and Construction of Armenia, the agreement of which was signed on 9 July, 2020. According to the agreement, the working group (a delegation from each institution) sought to obtain complete, astronomically applicable digitized data of Zorats Karer monument (exact coordinates of all stones, directions of existing holes, and some other data). The delegations conducted one-week joint research. BAO delegation comprised of Head of the BAO "Cultural Astronomy" department, the late lamented Grigor Brutean and junior researcher of the same department Hayk Malkhasyan.

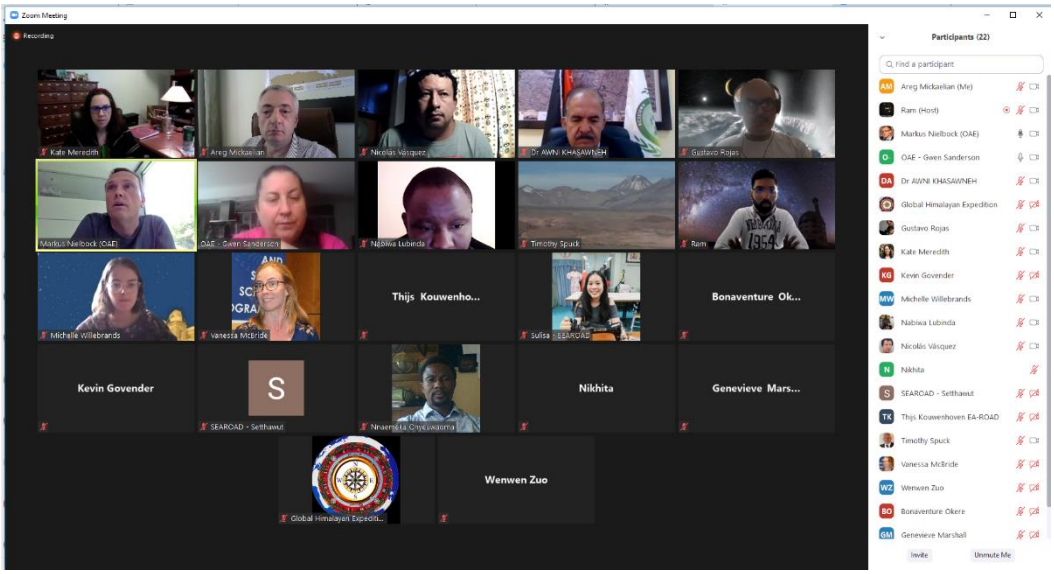
The group carried out complete and overall architectural and geodetical measurements of Zorats Karer monument, computer scanning of the adjacent area, aerial photography-scattering, photographed all the stones and stone holes of the monument, determined vectors of holes using modern digital equipment և digital methods.

As a result of the research, 84 new stones (not included earlier) of astronomical nature were discovered.

IAU OAD and Regional Offices (ROAD) Meeting

On 21 June, a meeting of the Office of Astronomy for Development (OAD) of International Astronomical Union (IAU) and the representatives of the regional offices took place, to which IAU Office of Astronomy for Development (OAD), Office of Astronomy for Education (OAE) and Office for Astronomy Outreach (OAO) representatives, as well as representatives of the regional offices took part, including the Byurakan Astrophysical Observatory's (BAO) director Areg Mickaelian.

During the meeting the activities of the centers were presented, the above-mentioned centers discussed the latest news and the cooperation between the regional centers and the IAU offices.



Screenshot of the ROAD meeting

The IAU coordinates Astronomy development through 11 regional offices and language expertise centres that are located in Armenia (South West and Central Asia), Colombia and Chile (Andean Region), Jordan (Arab World and Arabic Language), Ethiopia (East Africa), China (East Asia and Chinese Language), Netherlands (Europe), USA (North America), Portugal (Portuguese Language), Thailand (South East Asia), Zambia (Southern Africa), and Nigeria (West Africa). Each of the offices are hosted by a local institution or consortium of institutes and supported in their efforts by regional partners.

It should be noted, that on July 6, 2020, an agreement concerning the further hosting of the South West and Central Asian Regional Office of Astronomy for Development was signed between the International Astronomical Union and the Byurakan Astrophysical Observatory and will remain in force for 5 years.

The European Astronomical Society Annual Meeting Was Launched

On 28 June, the European Astronomical Society Annual Meeting was launched (EAS, formerly as EWASS) and will last till 2 July.

Every year the EAS organises its meeting in one of European countries to enhance its links with national communities, to broaden connections between individual members and to promote European networks. However, it has already been the second year, that due to the uncertain COVID-19 situation around the world, the meeting has been moved to a virtual platform (https://eas.unige.ch/EAS2021/).

Among the meeting participants are the Byurakan Astrophysical Observatory's director Areg Mickaelian, junior researhcers Naira Azatyan, Gor Mikayelyan and Sona Farmanyan. They have reports and scientific posters.

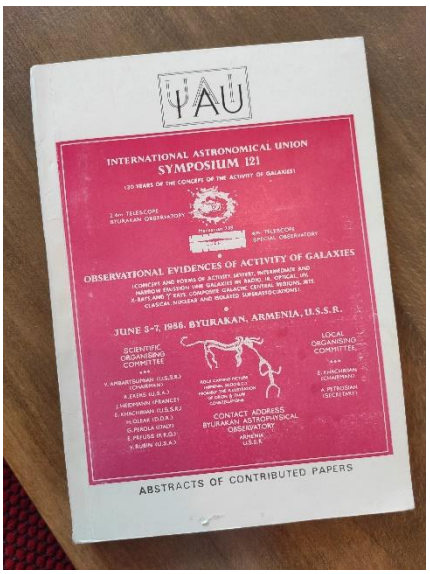
It should be noted, that the EAS was founded in 1990 and now comprises 30 national astronomical societies, including the Armenian Astronomical Society (ArAS). In 2007, the EAS annual meeting was held in Armenia in partnership with ArAS.

HISTORY PAGES

The 35th Anniversary of the IAU Symposium #121: Observational Evidences of Activity in Galaxies

35 years ago on 3-7 June, 1986, the IAU Symposium #121 devoted to the 30th anniversary of working out the idea of activity of galactic nuclei was held at the Byurakan Astrophysical Observatory.

60 foreign scientists from 16 countries (France, FRG, USA, UK, Mexico, Italy, Canada, GDR, Brazil, Bulgaria, India, Japan, Poland, Hungary, Netherlands, and S. Africa) and 53 scientists from different astronomical observatories and institutes of the Soviet Union participated. The scientists of the socialist countries participated in the frame of the agreement on scientific exchange between the Academies of Sciences of socialist countries and Academy of Sciences of the USSR.



IAUS 121

Chairman of the Scientific Organizing Committee (SOC) was Academician Viktor Ambartsumian (USSR, chairman), who couldn't be present because of illness, but whose message was read out for the participants.

11 invited reviews, 23 oral and about 40 poster contributions were presented.

Scientific topics included Surveys of Active Galaxies and QSOs; Galaxies with Ultraviolet Excess; Seyfert Galaxies, QSOs and Lacertides, Radiogalaxies; Intermediate Objects; Active Galaxies with Complex Central Regions; Galaxies with Narrow Emission Lines; Superassociations and Active Star Forming Regions; Interacting Galaxies

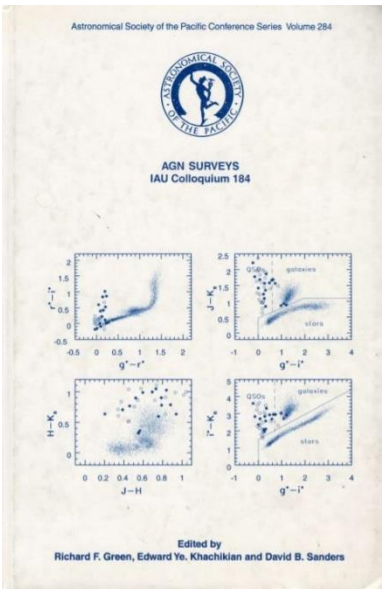
IAU Symposium 121 had an enormous significance for the confirmation of Byurakan ideas in the field of study of active galaxies, establishment and development of contacts with foreign scientists, leading authorities in the field of study of active galaxies.

More: https://www.bao.am/meetings/meetings/iaus121.php

The 20th Anniversary of IAU Colloquium #184 "AGN Surveys", Dedicated to the Memory of Beniamin Markarian

20 years ago on 18-22 June, 2001, the Byurakan Astrophysical Observatory hosted IAU Colloquium #184 on AGN surveys, devoted to the memory of B. E. Markarian, who was the first to conduct a systematic large-area survey for active galaxies and discovered 1500 UV-excess galaxies, later named Markarian galaxies.

Scientific Topics of the colloquium were Spectral and colorimetric surveys for AGN, Surveys for UV-excess galaxies, AGN from IR/submm surveys: IRAS, ISO, SCUBA, SIRTF, AGN from Radio surveys: NVSS, FIRST, and others, AGN from X-ray surveys: ROSAT, ASCA, BeppoSAX, Chandra, XMM, AGN statistics and cross-correlation of multiwavelength surveys, Physics and Cosmological Evolution of AGN, Study of unique AGN, Digital surveys and their advantage, Future giant projects, The Phenomena of Activity.



92 scientists from 16 countries (USA, Canada, Mexico, Japan, China, UK, Germany, France, Italy, Netherlands, Spain, Portugal, Poland, Russia, Kazakhstan, and Armenia) participated in the symposium, including 67 foreign (11 from former USSR), and 25 from Armenia. Among them there were distinguished scientists, such as Richard Green, David Sanders, Vahe Petrosian, Wolfgang Voges, Luis Ho, Sylvain Veilleux, Robert Antonucci, Joseph Mazzarella, Lutz Wisotzki, Roc Cutri, John Hutchings, Brigitte Rocca-Volmerange, and others. The IAU Colloquium 184 in Byurakan showed that building "complete" samples at various wavelengths was certainly necessary. The survey specialists exchanged the acquired experience, compared different surveys, discussed methodological problems, and elaborated a strategy for further investigations. It was helpful for planning the most efficient way to make significant advances in the field: plan future surveys best fitted to improve our knowledge about AGNs, coordinate observations with large ground-based and space telescopes, construct as homogeneous as possible sample of AGNs over the whole sky, obtain an overall patterns of the distant Universe and understand AGN phenomena and the related evolution of galaxies.

More: https://www.bao.am/meetings/meetings/iauc184.php

ANNIVERSARIES

Avetik Grigoryan's 60th Anniversary

On 14 June, former BAO researcher Avetik Grigoryan celebrated his 60th anniversary. He was born on June 14, 1961, in Yerevan. He graduated from the Yerevan State University in 1983 (Department of Astrophysics). From 1983 to 1985 he served in the Soviet Army, then he worked at the Theoretical Department of BAO up to 1992, first as an assistant astronomer and then as a junior research associate. After doing some research work on celestial mechanics, diffusion in nonhomogeneous medium, 9 light transfer and reverse problems on supernova envelopes and their spectra he started working on his Ph.D. thesis. However, the political and military situation in the region at that time forced him to leave BAO and dedicate himself to defense problems. He led the theoretical research work in that area, which came to its end after 9 years because of cutting the funding for such projects. Since 2000 he works in "LTX-Credence Armenia" IT company (subsidiary of US based "LTXCredence Corporation") as a technical writer.

Avetik Grigoryan

Apart from professional activity, Grigoryan started his educational activity in 1988. He developed an extracurricular course for secondary school students for teaching interesting aerospace subjects such as astronomy, aeronautics, aviation and astronautics. He founded an educational center now called Aerospace Club, which is promoting its activity till now.

Based on his long experience in education he wrote a popular science book "From the Deep of Ages to the Universe".

Avetik Grigoryan is a member of Armenian Astronomical Society (ArAS), the committee of the astronomy republican Olympiad.

Rudolf Muradian's 85th Anniversary

On 19 June, a well-known Armenian physicist, BAO former researcher Prof. Rudolf Muradian celebrated his 85th anniversary. Though he is a physicist-theorist, he has a significant contribution in the solution of astrophysical problems.

Rudolf Muradian

Rudolf Murad Muradian was born on June 19, 1936 in Yerevan. He graduated from the Moscow State University in 1959. In 1962, he successfully defended the candidate thesis in the field of physical-mathematical sciences. In 1962-1979, he worked at the United Institute of Nuclear Researches (Dubna, former USSR) (since 1966, as a senior scientist). In 1970, he defended the doctorate thesis in the field of physical-mathematical sciences and was awarded a title of professor. In 1979-1986, he was the Head of the Department of Radiation Researches of Yerevan Physics Institute. In 1984-1995, he worked as a leading scientist at the Byurakan Astrophysical Observatory (BAO). Then he left for Brazil and worked at the Institute of Physics of the Federal University of Baya.

Muradian's work refers to the problem of the theory of elementary particles, the large-scale structure of the Universe, cosmology, the theory of superdense matter, cosmogony and mathematical physics. He examined questions of higher symmetry of elementary particles. Proceeding from the properties of interactions of elementary particles, he proposed the hypothesis of scale invariance in the physics of high energy, which the so-called formula of quark account particularly results from. He discussed the origin of stars, galaxies and the Universe from the primary hadron, as well as the connection between the origin of rotation in the Universe and the superdense Universe, as well as between the cosmological constant and the rotation of the Universe. The hypothesis of cosmogony proposed by Muradian, connected with Viktor Ambartsumian's theory of cosmogony, allows to explain the origin of rotation of cosmic objects quantitatively, relying on the connection existing between the moment and the mass of the rotation known in the physics of elementary particles. As a result of the mentioned works, Muradian published more than 100 scientific papers, some in international high-ranked journals of physics and astrophysics. Muradian is a Lenin prize winner (1988), a member of the Academy of Vatican (Pontificia Academia) since 1994, and an academician of the National Academy of Sciences of the Republic of Armenia (NAS RA) since in 1996.

INTERNATIONAL NEWS

Recipients of 2021 Shaw Prize in Astronomy

Victoria M. Kaspi and Chryssa Kouveliotou

The Shaw Prize in Astronomy 2021 was shared equally by Victoria M. Kaspi, Professor of Physics and Director of McGill Space Institute, McGill University, Canada and Chryssa Kouveliotou, Professor and Chair, Department of Physics at George Washington University, USA for their contributions to our understanding of magnetars, a class of highly magnetised neutron stars that are linked to a wide range of spectacular, transient astrophysical phenomena.

Through the development of new and precise observational techniques, Victoria M. Kaspi and Chryssa Kouvelioto confirmed the existence of neutron stars with ultra-strong magnetic fields and characterised their physical properties. Their work has established magnetars as a new and important class of astrophysical objects.

The research carried out by Kaspi and Kouveliotou was motivated by the theoretical prediction that neutron stars with extreme magnetic fields up to a thousand times stronger than those in regular pulsars could form if dynamo action were efficient during the first few seconds after gravitational collapse in the core of the supernova. Such objects (termed magnetars) would be powered by their large reservoirs of magnetic energy, rather than by rotation, and were predicted to produce highly-energetic bursts of gamma-rays through the generation of highly energetic ionised particle pairs at their centres.

This prestigious award is a way in which the Shaw Prize Foundation seeks to promote astronomy, a mission shared by the IAU and one which the two organisations have ongoing collaborations to pursue.

More:

https://www.iau.org/news/pressreleases/detail/iau2104/?lang&fbclid=IwAR32otRGFZ8cr5ajL0TAlX161fAh4gFWDWoDOdg9msAdTKO6wud04H7gr1Q

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 ***melin.asryan@gmail.com****. They will be reviewed for the publication in ArAS Newsletters next issues.*

ArAS Newsletter issues are available online: https://www.aras.am//ArasNews/arasnews.html