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ArAS Newsletter

IAU SYMPOSIUM 365
DYNAMICS OF SOLAR AND STELLAR
CONVECTION ZONES AND ATMOSPHERES

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LOCAL NEWS

Armenian-Spanish Cooperation Program Is in Progress

Observations in the Armenian-Spanish cooperation program between the Byurakan Astrophysical Observatory (BAO) and Astronomical Observatory Ramon Maria Aller of the University of Santiago de Compostela came to an end.

Armenian-Spanish Cooperation. BAO. 2023

The collaboration began in 2016 with spectral and polarimetric observations of binary stars, replacing the old methods with the new one, called speckle interferometry.

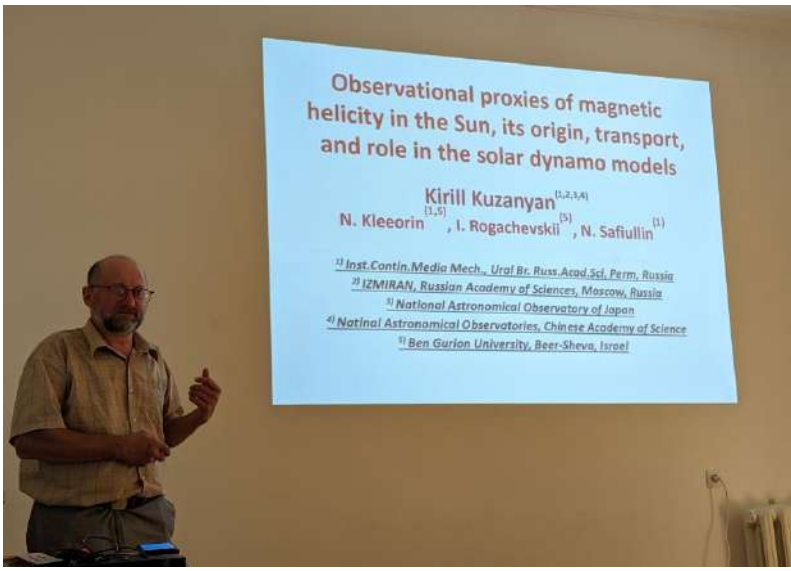
The method was put into practice only a few years ago thanks to the acquisition of the eMCCD device. The device makes it possible to observe stars that are suspected to be binary. Thus, many images are obtained by the speckle interferometry method, which are later combined and added together using special mathematical calculations. This allows to reduce atmospheric turbulence and remove the sky background. During each observation, as many measurements of the stars as possible are collected, and then these data are used to measure the orbits of the binary stars.

Observations were made with the 2.6 meters telescope, the largest in the BAO. Within the framework of cooperation, Spanish scientists visited the BAO every year to engage in joint research work.

G. Paronyan, BAO researcher and Alexei Grave, BAO engineer, together with J. Gomez and J. Couto from Spain participated in the program. The project from BAO was initiated by the late Norayr Melikian, Senior Researcher of BAO “Unstable Phenomena” Research Department.

Seminar by Kirill Kuzanyan

On August 28, the BAO hosted a seminar by Kirill Kuzanyan, from IZMIRAN, Russia. His speech was devoted to "Observational proxies of magnetic helicity in the Sun, its origin, transport, and role in the solar dynamo models".



Kirill Kuzanyan. BAO.2023

The researcher introduced the importance of magnetic helicity in magnetohydrodynamics as an inviscid invariant. As it is also mentioned in the abstract of the talk, in the context of solar physics, it is extremely important in several aspects. Firstly, its relaxation time is much longer than the turnover time of solar turbulence, and therefore, observations of magnetic structures such as active regions may bring essential information on its global distribution. Secondly, the local distribution and dynamics of its observational proxies is linked with the potential for solar flaring activity. And more, the transport of magnetic helicity which is generated by the solar dynamo mechanism and released to the heliosphere (where it is taken out by the solar wind) provides an important constraint on the dynamo models. The balance of helicity plays a role of a nonlinear feedback which determines complexity of dynamic behaviour of solar activity. We show that important observable properties of solar cyclicity can be obtained even with simple self-consistent models of solar dynamo with helicity.

Viewing Meteor Shower from Byurakan

Public Event

The Byurakan Astrophysical Observatory (BAO) continues organizing public events to promote astronomy and engage with the general public.

On August 11-13, the BAO hosted a public event dedicated to the Perseid meteor shower. Over those days, more than 3000 individuals visited the Observatory. This number indicates the growing interest of the public in Astronomy and the Observatory.

During these days the observatory visitors had the opportunity to participate in the lectures by the BAO director Areg Mickaelian, have a tour in the BAO territory, as well as visit 1m Schmidt telescope and Viktor Ambartsumian house-museum.

The night observations continued till 03:00, which is yet another testament to the public interest.

BAO Director Areg Mickaelian giving an open-air public lecture for the visitors. BAO. 2023

The Byurakan Astrophysical Observatory and the Space Camp

On August 6-12, the scientific-educational program “SpaceCamp 2023” was held at the Monte Melkonyan Military Sports Academy in Dilijan. This was already the 3rd such camp. The participants of the camp were young students aged 14-17. The main organizer of the Science Camp was the Ministry of High-tech Industry of the RA, and the co-organizer and the head of Astronomy topic was the Byurakan Astrophysical Observatory.

On August 10 and 11, the BAO director Areg Mickaelian, senior researcher Hovhannes Pikichian, leading researcher Haik Harutyunian, BAO researchers Hayk Malkhasyan, Naira Azatyan and Hayk Abrahamyan had interactive lectures for children. Various topics were presented and discussed: the past of Armenian space activities, the laws of celestial mechanics, the world of nebulae and galaxies, space telescopes, Zorats Karer and Armenian petroglyphs, etc. Moreover, BAO associate Andranik Sukiasyan organized observations with a small telescope for the participants.

3rd Science Camp. Dilijan. 2023

INTERNATIONAL NEWS

Armenia Hosts IAU Symposium 365

“Dynamics of Solar and Stellar Convection Zones and Atmospheres”

On August 21-25, the Byurakan Astrophysical Observatory, together with Lomonosov Moscow State University and the International Astronomical Union (IAU) organized the IAU symposium “Dynamics of Solar and Stellar Convection Zones and Atmospheres” in Yerevan. This year Armenia hosted an IAU symposium for the 7th time in its history. Armenia, consequently the BAO, had the honor to host symposia in 1966, 1986, 1989, 1998, 2001 and 2013.

The Symposium brought together solar and stellar physicists investigating the dynamics of convection zones and lower atmospheres.
It was dedicated to observational and theoretical aspects of the hydrodynamics and magnetohydrodynamics, both global and local, of the solar and stellar convection zones and lower atmospheres with the inclusion of numerical simulations as a particular branch of theoretical research.

Figure 1IAU Symposium 365. 1st Day. Yerevan. 2023

The five-day program included 6 sessions with many captivating talks, discussing topics from differently scaled solar convection and magnetoconvection and models of stellar convection to Miscellaneous subjects.
At the opening of the conference, participants were welcomed by Alexander Getling, Professor of Lomonosov Moscow State University, chairman of the Scientific Organizing Committee of the conference, Ashot Saghyan, the president of the RA National Academy of Sciences (NAS), Mihran Aroian, Representative of the RA Ministry of Economy (USA), Eric Tintrup, deputy ambassador of the Federal Republic of Germany, and Areg Mickaelian, the BAO director, chairman of the Local Organizing Committee of the conference.

In recent decades, the topic has been of great interest among researchers. Thanks to modern observational equipment on orbiting observatories, a large amount of valuable data is now available, which contributes to the progress of research on the subject.

Among the main topics discussed at the conference are heat transfer, solar and stellar differential rotations and meridional rotations, global dynamo, solar and stellar seismology, local processes of magnetic flux generation, sunspots and starspots.

More about the conference here: http://iaus365.sinp.msu.ru/

IAU Symposium 365. Closing Ceremony. Yerevan. 2023

The Fourth Country to Land on the Moon

On Aug 23, 2023, the Indian Space Research Organization's (ISRO) Chandrayaan-3 mission landed near the Moon's south pole. Next day the rover took a walk on the lunar surface in hope of collecting vital information about its south pole region. The mission aims to demonstrate the capability of the lander and rover on the lunar surface, as well as conduct scientific experiments for 14 days, or one lunar day, according to ISRO. The modules will test the Moon's surface plasma density, thermal properties, soil composition, and internal activities. The surface of the Moon's south pole is believed to house water ice across its more rugged terrain than previously explored areas of the Moon.

ISRO's Chandrayaan-3 image taken of the lunar surface after landing April 23, 2023. Credit: ISRO (via Instragram)

India is the first country to land on the Moon since 2020, when China's Chang'e 5 visited our satellite to collect lunar surface samples. Chandrayaan-3 officially launched into orbit on July 14 from the island Sriharikota off the coast of India. To achieve the proper landing, the mission performed multiple orbit-raising maneuvers before entering translunar orbit. On Aug 23, the mission announced on the ISRO website, "I reached my destination and you too!" The Vikram lander, which contained the Pragyan rover, made a soft landing on the surface and the rover rolled out of the lander the day after.

This is the first successful landing for the country. Four years ago, Chandrayaan-2 entered into lunar orbit, but the lander and rover crashed into the Moon's surface. (The orbiter, however, remains operational to this day.) Read more in Astronomy Magazine's post.

ANNIVERSARIES

Hovsep Chavushian's 85th Anniversary

Hovsep Chavushian

Dr. Hovsep Chavushian's name is associated with the long-time investigations of non-stable stars at BAO, particularly flare stars in Pleiades.

Hovsep Chavushian was born on 17 August 1938 in Mosul, Iraq (1938-2014.). He graduated from the Yerevan State University (YSU) Department of Physics with a specialization of Astrophysics in 1962 and the same year joined the BAO. He had his PhD fellowship in 1969-1972 and defended his thesis in 1979 under the supervision of Prof. L.V. Mirzoyan. Chavushian was a Senior Research Associate since 1984.

Chavushian's main area of research was non-stable stars, particularly flare stars. During his life, he published more than 60 papers on flare stars and stellar associations, mainly focused at Pleiades stellar system. He was one of the main authors of the series of paper on Flare stars in Pleiades, co-authored by V.A. Ambartsumian, L.V. Mirzoyan, E.S. Parsamian, L.K. Erastova and others. Chavushian collaborated with a number of foreign astronomers, including L. Rosino (Italy), M. Tsvetkov and K. Tsvetkova (Bulgaria), I. Jankovics (Hungary), V. Venugopal (India), R. Natsvlishvili (Georgia).

Chavushian's important contribution to the development of astronomy and other exact sciences (Physics, Mathematics) in Armenia was his long-year teaching at the Byurakan secondary school, the Physical-Mathematical School at the Yerevan State University (YSU), and YSU. Dozens of youngsters from Byurakan village received higher education due to Chavushian's efforts, almost all Byurakan people at present having higher education.

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.*

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