ArAS News

N E W S L E T T E R OF THE
ARMENIAN ASTRONOMICAL SOCIETY (A r A S)

No. 46 (March 31, 2011)

CONTENTS:

The ArAS Newsletter in the INTERNET: http://www.aras.am/ArasNews/arasnews.html

UNESCO SCIENCE REPORT 2010

According to UNECSO Armenia is one of the best by relative numbers

Recently UNESCO published a report based on its survey on the state of science in the world ("UNESCO Science Report 2010: the Current Status of Science around the World"). A detailed statistics on each country is presented. By the number of publications in 2000-2008 (only high-level journals have been taken into account), Armenia is one of the leaders in Central and Western Asia, where 10 countries are included. Armenian having 544 publications comes after Israel (the data concern 2008, the last year surveyed). The next countries are Georgia (328), Uzbekistan (301), Azerbaijan (292), Kazakhstan (218), Mongolia (115), Kirgizstan (54), Tajikistan (45) and Turkmenistan (3). If taking former Soviet Union (FSU) countries, Armenia has better numbers than Latvia and Moldova too, and only Russia, Ukraine, Lithuania, Belarus and Estonia have more publications. The absolute leaders in the world in 2008 were the following countries: USA (272879 publications), China (104968), Germany (76368), Japan (74618), UK (71302), France (57133), Italy (45273), Canada (43539), India (36261), Spain (35739), South Korea (32781), Australia (28313), Russia (27083), Brazil (26482), Netherlands (22945), etc. Armenia is the 70th in this total list. The scientific results of countries more or less reflect the economic power, i.e. the countries with powerful economies are also leaders in science (as well as countries with the largest number of population and territory). From this point of view, the activity of the Armenian scientists is obvious by relative numbers.

According to UNESCO, there were 4927 scientists in Armenia in 2002 (47.0% female) and 4114 scientists in 2007 (44.7% female). So the number of scientists has been decreased while it has been increased in almost all other countries. This number has been increased in all European countries, USA, Canada, Japan, China, Australia, most of other American, African, and Asian countries by 1.1-1.5 times. Nonetheless, the number of scientists in Russia fell from 415 to 376 thousand, in Ukraine, from 85 to 79 thousand, in Georgia, from 12 to 8 thousand, but grew up in Azerbaijan from 10 to 11 thousand. Armenia is 48th in the world by the number of scientists (1339) per 1 million population (however data not for all countries are available). This number is between 1000 and 13000 in the European countries (the highest numbers are in Northern countries: Iceland 13181, Finland 10111, Norway 8845, Sweden 7982, and Denmark 7895). USA have 4663 scientists per 1 million people, Japan has 6934, and Russia has 2658.

The activity of the Armenian scientists is striking if considering the number of publications per scientist. E.g., 544 Armenian publications have been provided by 4114 scientists (the average number per scientist is 0.132), Georgian 328, 8112 scientists (0.040), and Azerbaijanian 292 publications, 11280 scientists (0.026), i.e. Armenian scientists have 3 and 5 times higher efficiency than Georgian and Azerbaijani scientists, respectively. By this number Armenia is one of the leaders among the FSU countries and shares the 1-2 positions together with Estonia. The next countries are: Lithuania (0.125), Moldova (0.086), Russia (0.072) and Ukraine (0.063). USA's number is 0.191, and the European countries have numbers between 0.1 and 0.5. However, if taking into account the funding of these scientists, Armenia is an absolute leader. Particularly, according to UNESCO, the Armenian government has allocated an equivalent of USD 36.2 million in 2007 (by the way, these data are overestimated, as the official science funding from the budget was an equivalent of USD 20 million), in Georgia 27.8, in Azerbaijan 114.4. The funding per scientist in Armenia was an equivalent of USD 8.8 thousand, and these numbers in the FSU

countries are between 3.4 and 62.2, being the highest in Russia. As a result, an average Armenian scientist has annually provided 0.015 publication against each USD 1000, Georgians 0.012, Tajik 0.006, Lithuanians 0.004, Estonians and Azerbaijani 0.003, Latvians and Ukrainians 0.002, and Russians 0.001 publications. The average European numbers by such calculations are 0.001-0.002, USA, China, Japan, South Korea and India 0.001, i.e. the productivity of the Armenian scientists is 10-15 times better than that of the European, USA and developed Asian countries scientists. Note that the average annual funding of a scientist in the European developed countries is an equivalent of USD 153.3 thousand, i.e. 17 times more than that of an Armenian scientist (the highest number is in the Netherlands, 240.9). This number is even higher in the USA (279.3), Australia (175.4), Canada (172.4), and Japan (167.5).

It is worth mentioning that the efficiency of the Armenian scientists has increased in 2000-2008 by 74% and by this number Armenia also is one of the leaders. These numbers for the FSU countries are between 1.1 and 1.3, and for some countries, there is a decrease of the number of publications.

If taking individual science fields, Armenian scientists have most striking advantage in physics and astrophysics, Earth and biomedical sciences. UNESCO also separately gives publications in frame of international collaborations, where Armenia also is among the leaders in the Central and Western Asia and comes as the 2nd after Israel. Armenian scientists have been much ahead of others in all years during 2000-2008.

Areg Mickaelian

JENAM-2011 in ST. PETERSBURG

The Joint European and National Astronomical Meeting, the *"European Week of Astronomy and Space Science",* is the EAS meeting combined with the Euro-Asian Astronomical Society (EAAS) annual meeting. It will be held on **July 4-8, 2011** in **St. Petersburg, Russia**. The scientific program consists of 9 EAS Symposia and 10 Special Sessions, as well as plenary sessions, EAS and EAAS General Meetings and some other additional sessions.

Symposia:
S1: *Magnetic Universe*
S2: *Planets of the Solar System and Beyond*
S3: *The Sun: New Challenges*
S4: *Solar System Measurements of the Next Decade*
S5: *Physics of Stars*
S6: *Combined Radio/X-rays Approaches to Relativistic Astrophysics*
S7: *Far-Infrared Spectroscopy comes of age: the Herschel view*
S8: *Status and prospects in high-energy & particle astrophysics across the electromagnetic spectrum*
S9: *Galaxy Evolution: the key for Galaxy Formation theories*

Special sessions:
SPS1: *Close Binaries with Compact Components*
SPS2: *Massive Stars Formation*

SPS3: *Science with the Virtual Observatory*
SPS4: *What powers AXPs and SGRs?*
SPS5: *Minor merging as a driver of galaxy evolution*
SPS6: *Space Projects*
SPS7: *The Missing Baryons and the Warm-Hot Intergalactic Medium: Current State and Future Prospects*
SPS8: *Astronomy Education and Public Outreach*
SPS9: *Amateur and professional astronomers in Europe*
SPS10: *European Astronomy: Moving Forward*

Important Dates:

25.04.2011	Deadline of abstracts and request for grants
31.05.2011	Results of Grant applications / Final programme release
31.05.2011	End of early registration
27.06.2011	End of late registration
04-08.07.2011	JENAM-2011

Early registration:	280* EUR	students 170 EUR
Late registration:	330* EUR	students 220 EUR
Desk registration:	380* EUR	students 270 EUR
Accompanying person	120 EUR	

* *EAS members will have a reduction of 30 EUR*

JENAM-2011 webpage is available at http://jenam2011.org/. Contact: jenam2011@gao.spb.ru.

50th ANNIVERSARY of YURI GAGARIN'S FLIGHT into SPACE

On 12 April 1961, Yuri Gagarin made the first human flight in space. 12 April 2011 will be the 50th anniversary of this event. In "Vostok" spacecraft Gagarin made one circle around the Earth in 89 minutes and successfully returned back. In the same year, three more flights were accomplished: by two Americans (Alan Sheppard and Virgil Grissom) and by another Soviet cosmonaut German Titov. Thus, the space era began. 530 astronauts from 36 countries have accomplished space flights so far.

The 50th anniversary of this significant event will be celebrated in a number of countres. The largest event, "Starmus" festival, will be held on June 20-25 in Canary Islands and is being organized by *Prof.* Garik Israelian. A number of famous astro/cosmonauts, Nobel Prize winners, and in total more than 5000 guests will tae part.

In Armenia, we also plan to organize some events. Particularly, according to an agreement between the Presidium of the Armenian National Academy of Sciences (NAS RA) and "Rossotrudnichestvo" ("Russian collaboration"), a solemn scientific meeting will be held on April 12 in the hall of the Presidium of NAS RA, where a number of talks will be given. A day before, on April 11, a youth seminar will be held in the Conference Hall of the Byurakan Astrophysical Observatory (BAO), where selected school pupils and teachers will be present. Also at BAO, an International Gagarin symposium for students and young scientists of CIS countries will be organized named "Under Byurakan's clean sky" (the dates will be announced later). Gagarin lectures and other events will be held in a number of schools.

ANANIA SHIRAKATSI 1400TH ANNIVERSARY EVENTS

Anania Shirakatsi was the greatest Armenian scientist of the middle Ages. He was a philosopher, mathematician, cosmologist, chronologist, the founder of exact and natural sciences in Armenia. Having advanced astronomical views for his epoch and having left rich astronomical heritage, Shirakatsi is by right considered to be the founder of astronomy in Armenia. He was born in 612 or 613 (the exact year is unknown). To celebrate his 1400th birthday anniversary, we have proposed to organize a number of events in 2012-2013. An official proposal was sent on behalf of the Armenian National Academy of Sciences to the Armenian Government. Two Ministries were also engaged: the Ministry of Culture and the Ministry of Education and Science. This proposal has already been approved, and a number of events will be planned and accomplished in 2012-2013 in the Byurakan Astrophysical Observatory (BAO), Yerevan State University (YSU), Armenian State Pedagogical University, Vanadzor State Pedagogical Institute, Gyumri State Pedagogical Institute, and Yerevan Anania Shirakatsi College. Jubilee Committee will be formed, involving officials from the State organizations and scientists. A proposal to UNESCO has also been submitted to officially celebrate this anniversary.

One of the purposes to celebrate Anania Shirakatsi's 1400th anniversary and give a large to this event, is to develop and promote archaeoastronomical matters in Armenia. Our goal is to start a collaboration with historians and archaeologists and a preliminary collaboration agreement has already been signed between 4 institutions: BAO, Institute of History, Institute of Archaeology and Ethnography, and Matenadaran (the Museum of Ancient Manuscripts). The ICOMOS Armenian Office will also participate. Among the events of astronomical interest, we plan a global survey for historical-astronomical matters in Armenia (study and listing, creation of webpages): rock art, Armenian calendar and chronology, ancient observatories (Karahunge, Metzamor, etc.), astronomical terminology, historical records of astronomical events, Anania Shirakatsi's heritage, Armenian astronomy of the Middle Ages, etc. An archaeoastronomical symposium (*"Astronomical Heritage and modern society"*) in 2012 is also planned in collaboration with the UNESCO Astronomy and World Heritage project and corresponding IAU Working Group.

Areg Mickaelian

ICRANet MEETING in PESCARA

Armenia participates in the International Centre for Relativistic Astrophysics

On February 21-22 in Pescara, Italy, a meeting of the Governing Committee of the International Centre for Relativistic Astrophysics Network (ICRANet, http://www.icranet.org/) took place, where the results of the last year's activities and the next year's budget were discussed. This centre has its branch in Armenia and BAO Director Haik Harutyunian also took part in the meeting. One of the most important achievements reported was connected with the organization of post-university education for young people coming from the European universities, as well as organization of a number of meetings in different countries. The fact that the Italian parliament had unanimously

decided to award an international status to the Centre with all resulting advantages was stated as an important achievement. As it is known, ICRANet was founded in 2002, and Armenia joined in 2003. Armenia, together with Italy and Vatican is considered as a founding member of the Centre, and later Brazil joined these countries. At present works to develop the Armenian and Brazilian branches are being carried out. As it is stated in this year's official protocol of the Governing Committee, the Armenian Branch has a strategic importance to link the Centre with the Middle East and Central Asian countries. According to the decision of the Committee, the ICRANet Director *Prof.* Remo Ruffini has sent official letters to the corresponding bodies in Armenia and Brazil to discuss in the parliaments and award international status to the ICRANet branches of these countries.

EURO-VO SCHOOL in STRASBOURG

Armenian student Gohar Harutyunyan participated in the Euro-VO school

On March 21-24, the European Virtual Observatory (Euro-VO) project, in the framework of the Euro-VO International Cooperation Empowerment (ICE), organized an international VO School for young astronomers interested in the virtual astronomy at the Observatoire de Strasbourg, France. The Virtual Observatory (VO) is opening up new ways of exploiting the huge amount of data provided by the ever-growing number of ground-based and space facilities, as well as by computer simulations. VO is in fact collaboration between astronomers and computer scientists. One of the biggest world astronomical databases (CDS) is located at the Strasbourg Observatory and best VO specialists work there, who shared their knowledge and skills with young astronomers during the school. The goals of the School were to expose European astronomers to the variety of VO tools and services available today so that they can use them efficiently for their own research. Thanks to collaboration between the Armenian and European Virtual Observatories, together with 30 other participants, YSU Physics Department Master student and Armenian Virtual Observatory (ArVO) project member Gohar Harutyunyan also took part. The other participants represented UK, Germany, France, Italy, Spain, Austria, Greece, Bulgaria and Chile. Each student presented a scientific project, which was accomplished utilizing VO tools. Gohar Harutyunyan presented the project *"Multiwavelength Study of Bright Active Galaxies"*, which is being successfully developed by the ArVO group in the Byurakan Observatory. As a result, a multiwavelength catalog of bright active galaxies, study of their multiwavelength SEDs, revision of classifications, as well as detailed studies of X-ray, UV, optical, IR, and radio properties of these objects is expected.

ArAS/OxArm POPULAR ASTRONOMY PRIZES

To encourage popular astronomy publications and programs in Armenia, ArAS and the Oxford Armenian Society (OxArm, http://oxarm.com/Home.html) have jointly established annual popular astronomy prizes. The idea was discussed between the ArAS Co-President Areg Mickaelian and ArAS member, astrophysicist and cosmologist from the University of Oxford (UK) Mihran Vardanyan, who will sponsor this

initiative. A Committee (Jury) will be created from scientists and journalist to evaluate the presented works and to decide the winners. The 2011 Prizes established are the following:

- **for the best newspaper/journal/online article**
- **for the best radio/TV program**
- **for the most active journalist** (more than one prizes are possible)
- **for the best astronomical photo**

Materials published or broadcasted and photos taken during 2011 will be taken into account. The hardcopies and/or electronic versions of these materials should be submitted before November 30. The works should be somehow related to space themes. To give better visibility and possibility to make comments, all materials may be posted in the Facebook Scientific Journalism group page (http://www.facebook.com/home.php#!/home.php?sk=group_144651068920380&ap=1) and these comments will be taken into account by the Jury.

Each prize consists of ArAS/OxArm official certificate, 30000 Armenian Drams (AMD) monetary award, and annual subscription to one of the international science journals (Science, Nature, or New Scientist). The results will be known and the prizes will be awarded at the end of December at the Scientific Journalism seminar and closing annual meeting. It is planned to continue this initiative in the next years and even increase the monetary award.

SCIENTIFIC JOURNALISM SEMINAR in BYURAKAN

On April 16, Saturday, the first Scientific Journalism 1-day seminar will be held in the Byurakan Observatory Conference Hall. Science writing journalists will take place from all major mass media actively working in Armenia. Current state and problems of scientific journalism in the world and in Armenia will be discussed, information on the state of astronomy and BAO will be provided to the journalists, as well as on related topics (space flights, extraterrestrial civilizations, archaeoastronomy, astrology, etc.). As excursion will be organized in the observatory and a reception will be offered.

SCIENTIFIC JOURNALISM NEWS

In December 2010 a group of Scientific Journalists of Armenia was created to facilitate and promote scientific (mostly astronomical) publications in mass media. Some 60 members are involved in this group from various mass media: TV, radio, newspapers, Internet media, as well as some other scientists. A significant increase of scientific publications and of interest to astronomy/ science has been recorded.

As a result of 27 press-releases circulated to Scientific Journalism group members during 3.5 months, almost 200 publications in newspapers and Internet web-sites appeared. Moreover, a number of interviews and press-conferences were taken additionally to present more detailed materials on Virtual Observatories and Virtual Astronomy, State of astronomy in Armenia, Astronomy and Astrology, Cosmic garbage, Practical use of astronomy, Moon's closest approach to Earth, UFOs and Extraterrestrials, Cosmic catastrophes, Solar energy, etc. For the moment, the prevailing number of the publications is related to space subjects and contribution from other fields of science is desirable and welcome.

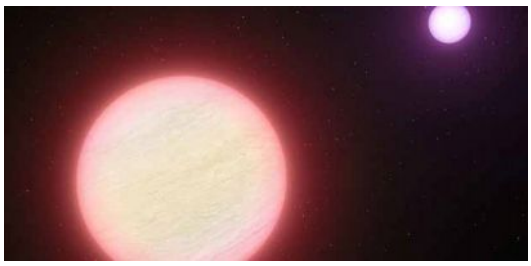
METEORITE CRATER FOUND on MOUNT ARARAT?

Astrophysicists Vahe Gurzadyan from the Yerevan Physics Institute in Armenia and Sverre Aarseth from the University of Cambridge in the UK, discovered an unrecorded crater that raises the possibility that the biblical mountain Ararat was struck by a meteorite. A British scientific publication *"Observatory"* will soon publish an article about the discovery. However, after appearing on the University Cornell website it had already spread around the world. Mount Ararat is an ancient, isolated volcano in eastern Turkey near the borders with Armenia. The northern and western slopes of the mountain are closed to public but somehow the two physicists gained access.

At an altitude of 2100m, at coordinates 39°47′30″N and 44°14′40″E, they found a well-preserved and previously unrecorded crater some 70m across. Gurzadyan and Aarseth think that it is the result of a meteorite impact. They rule out a glacial origin on the grounds that 2100m is well below the glacier line. Gurzadyan and Aarseth publish their account with the intention of attracting interest so that the crater can be properly classified.

ESO NEWS

A Very Cool Pair of Brown Dwarfs



Observations with the ESO's Very Large Telescope, along with two other telescopes (Keck II and Canada-France-Hawaii 3.6m), have shown that there is a new candidate for the coldest known star: a brown dwarf in a double system with about the same temperature as a freshly made cup of tea – hot in human terms, but extraordinarily cold for the surface of a star. This object is cool enough to begin crossing the blurred line dividing small cold stars from big hot planets.

Brown dwarfs are essentially failed stars: they lack enough mass for gravity to trigger the nuclear reactions that make stars shine. The newly discovered brown dwarf, identified as CFBDSIR 1458+10B, is the dimmer member of a binary brown dwarf system located just 75 light-years from Earth.

The dimmer of the two dwarfs has now been found to have a temperature of about 100 degrees Celsius – the boiling point of water. Unravelling the secrets of this unique object involved exploiting the power of three different telescopes. CFBDSIR 1458+10 was first found to be a binary using the Laser Guide Star (LGS) Adaptive Optics system on the Keck II Telescope in Hawaii. Liu and his colleagues then employed the Canada–France–Hawaii Telescope, also in Hawaii, to determine the

distance to the brown dwarf duo using an infrared camera. Finally the ESO VLT was used to study the object's infrared spectrum and measure its temperature.

The hunt for cool objects is a very active astronomical hot topic. The Spitzer Space Telescope (SST) has recently identified two other very faint objects as other possible contenders for the coolest known brown dwarfs, although their temperatures have not been measured so precisely. Future observations will better determine how these objects compare to CFBDSIR 1458+10B. Liu and his colleagues are planning to observe CFBDSIR 1458+10B again to better determine its properties and to begin mapping the binary's orbit, which, after about a decade of monitoring, should allow astronomers to determine the binary's mass.

The release, images and video are available at http://www.eso.org/public/news/eso1110/.

ANNIVERSARIES

Ruben BUNIATIAN – 60. Recently Ruben Buniatian, the leader of amateur astronomers in Armenia and an ArAS member, celebrated his 60th anniversary. He was born on 17 February 1951 in Armenia. He finished the phys-math school at the Yerevan State University (YSU) and then entered and graduated from the Yerevan Polytechnic Institute (at present: Armenian State Engineering University). Astronomy was and remains the main hobby for Buniatian. In 2004 he organized in Yerevan mass observations of Venus transit over the Sun's disk and this event was widely reflected in mass media. At that time he got acquainted to a number of talented young people and in the same year on September 18 he organized the next amateur observations dedicated to distinguished scientist Viktor Abartsumian's birthday. Encouraged with successful accomplishment of this event, the group decided to celebrate Ambartsumian's birthday every year on September 18 and organize frequent amateur astronomical observations. Gafeschian foundation has greatly supported the group. On occasion of Ambartsumian's 100th anniversary and on the direct initiative of R. Buniatian and G. Melikian, a letter with numerous signatures was submitted to the President of Armenia Serzh Sargsyan to adopt September 18 as an official Day of Astronomy in Armenia. And by the Resolution No.13 from 8 January 2009, September 18 was announced as the Day of Astronomy in RA. The public activities of Buniatian were extended to astronomical observations in numerous Yerevan schools, as well as an astronomy lesson and observations were organized in Abovyan city. In July 2009, Buniatian and some other amateur astronomers took part in the ArAS VIII Annual Meeting in Byurakan, and he gave a talk on the state of amateur astronomy in Armenia. This was the first official collaboration of amateurs with professional astronomers in Byurakan. In May 2010, by an immediate initiative of Buniatian, "Goodricke John" amateur astronomical organization was founded. The organization supported not only astronomy but also science and culture promotion and development especially among the youth. We wish new successes to this amateur astronomers' organization and to Ruben Buniatian personally as well.

OBITUARIES

Alenush Terian, the first Iranian female astronomer and physicist died on March 4, 2011 in Tehran, Iran. She was born on 9 November 1920 to an Armenian family in Tehran. Terian graduated in 1947 in the Science Department of University of Tehran. She began her career in the physics laboratory of this university and was elected the chief of laboratory operations in the same year. For continuing her studies, Terian left Iran for France where in 1956 she obtained her doctorate in Atmospheric Physics from Sorbonne University. Upon this she returned to Iran and became Assistant Professor in thermodynamics at University of Tehran. Later she worked in Solar Physics in the then West Germany for a period of four months through a scholarship that was awarded by the German government to University of Tehran. In 1964 *Dr.* Terian became the first female Professor of Physics in Iran. In 1966, *Prof.* Terian became Member of the Geophysics Committee of University of Tehran. In 1969 she was elected chief of the Solar Physics studies at this university and began to work in the Solar Observatory of which she was one of the founders. *Prof.* Terian retired in 1979. *Prof.* Terian's 90th birthday celebration in Tehran was attended by a number of Iranian parliamentarians and over 100 Iranian Armenians.