

# CRD FRIENDS

## NEWSLETTER



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### ADVANCED SCIENCE SUMMER SCHOOL AT YEREVAN PHYSICS INSTITUTE



**Advanced Science Summer School participants from Yerevan State University and Armenian State Pedagogical University with instructors from Yerevan Physics Institute**

The advanced Science Summer School in High-Energy Physics, Atmospheric and Cosmic Ray Physics, and Particle Accelerator Physics was held from August 17 to 20 at the Yerevan Physics Institute (YerPhI), named in honor of its founder - Artem Alikhanyan.

Twenty-four students from Yerevan State University and the Armenian State Pedagogical University participated in the summer school. Lectures and classes were delivered by senior scientists from various divisions of the Yerevan Physics Institute. Classes were held both at the Aragats Cosmic Ray research center on Mt. Aragats and at the Yerevan Physics Institute's headquarters in Yerevan. On the final day of classes the group visited CRD's Aragats Cosmic Ray Research Center atop Mt. Aragats at 10,500 ft. elevation; the world's largest research center for monitoring secondary cosmic rays.

During the course of 15 lectures and classes students were introduced to the most important new developments in cosmic ray and atmospheric physics, cosmology, accelerator physics, applied research, and information technology (IT). During laboratory sessions the students assembled systems of particle detectors, measured elemental composition of materials, and became acquainted with modern Graphic Processing Unit (GPU) servers. They measured the yield of medical isotope production at YerPhI's newly established medical isotope production laboratory.

The hands-on nature of the summer school impressed upon the students that physics is a multidimensional discipline and the road from measurements to scientific models and discoveries is a proven path to practical applications.

Yerevan Physics Institute provides modern experimental facilities for students, preparing them to represent Armenia within the international scientific community. The mission of the National Laboratory includes high standards of education in Master and PhD programs, clearly demonstrating that science and education are vital elements for Armenia's continued development. The Armenian National Laboratory's Master courses for physics students provides a high quality education in physics prior to entry into the PhD program, and prepares students for research in an academic environment, in national research laboratories, and in industry. To apply for the Masters program see <http://www.yerphi.am/index.php/young-scientists-and-students/master-courses> .

## INTERNATIONAL CONFERENCES AND WORKSHOPS AT NOR AMBERT, ARMENIA



**Participants in the LEAD Workshop at CRD's Nor Ambert research and conference center in Armenia.**

Despite lightning and thunderstorms being a common phenomenon, their underlying physics is still not well understood. Thunderstorms often cause significant economic damage and endanger lives. Experiments at CRD's Aragats Research Station at 10,500 ft. elevation recorded multiple features of thunderstorms and lightning together with relevant meteorological parameters.

About twenty scientists from Armenia, Germany, Japan, Kazakhstan, and Russia met to discuss these phenomena at a workshop on *Lightning initiation, Electron acceleration and Atmospheric Discharges (LEAD)* held at the Nor Amberd International Conference Center of the Cosmic Ray Division of the Yerevan Physics Institute (YerPhi) in Armenia, from June 9 through June 12.

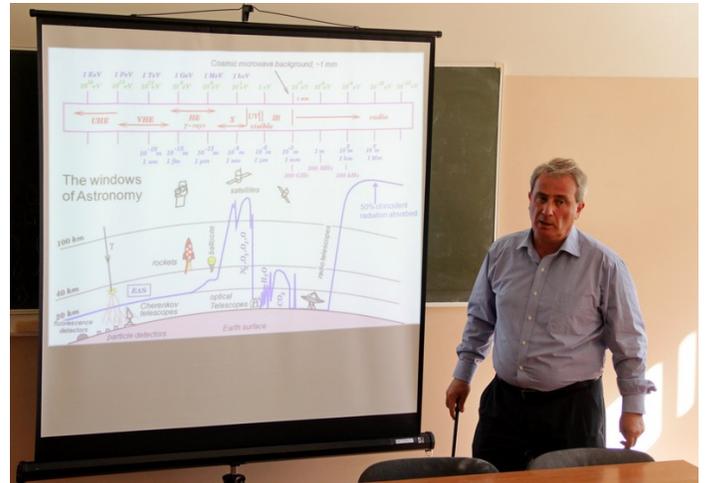
There was general agreement among the participants that the vast archive of unique data from observations of energetic thunderstorms acquired at the Aragats Space Environmental Center (ASEC) is extremely valuable. The data is being analyzed by CRD scientists and is publicly available at <http://www.crd.yerphi.am/adei/> for other experts to analyze and for collaboration with CRD scientists.

The fifth annual workshop on *Thunderstorms and Elementary Particle Acceleration (TEPA 2015)*, organized by the CRD, will be held from October 5 through 9 at the Nor Ambert conference center, <http://crd.yerphi.am/Conferences/tepa2015/home>

Participants from 7 nations will attend this workshop, originally founded and currently led by the CRD. It was intended to rotate the conference among participating countries, but by popular demand of attendees, the conference is being held in Armenia each year.

Special scholarships for student participants are available.

## PORTRATE OF RAZMIK MIRZOYAN, CONTINUING TO GIVE BACK TO ARMENIA



**Prof. Razmik Mirzoyan, currently astrophysicist at Max Plank Institute for Physics, Munich, Germany, teaching at one of CRD's workshops for students and young scientists.**

Prof. Razmik Mirzoyan is a senior astrophysicist at the Max-Planck-Institute for Physics in Munich, Germany. He is the chairman of the MAGIC collaboration, operating one of the most successful facilities in Gamma Ray astronomy.

Born in Yerevan, Armenia, Dr. Mirzoyan graduated with a degree in physics from Moscow Nuclear Physics University in 1977 and received his PhD in 1985 from the Lebedev Physics Institute of the Academy of Sciences of USSR in Moscow. The difficult events of the early 1990's caused him to leave Armenia and pursue his scientific career in Germany.

Prof. Mirzoyan took a leading role in the design, construction, and operation of the six imaging telescopes of the HEGRA international collaboration on the Canary Islands. Upon conclusion of the HEGRA experiment, he led the creation of the MAGIC Cherenkov radiation telescope system, also on the Canary Islands.

Now Prof. Mirzoyan actively participates in the leading European astrophysical project to design a new Cherenkov Telescope Array. He is also the head of the TAIGA experiment near Lake Baikal in Russia. This experiment will search for ultra-high gamma ray sources in the universe and measure other aspects of cosmic radiation.

Prof. Mirzoyan visits Armenia every year, delivering lectures to young scientists at the Yerevan Physics Institute and consulting with Cosmic Ray Division (CRD) experts in various topics of experimental particle physics.

On December 27, 2014, Prof. Mirzoyan was elected a foreign member of the National Academy of Sciences of the Republic of Armenia.

**CRD ANNUAL BIKE-A-THON RAISES FUNDS AND AWARENESS OF ARMENIA'S TALENT – by Anahid Yeremian**



On the road from Haghartzin to Ijevan.

The sixth Annual bike-a-thon from August 10 through 13 to raise funds for the scientists of the Cosmic Ray Division (CRD) of the Yerevan Physics Institute was another smashing success under the leadership of the world renowned cycling coach, Mr. Albert Soloyan. This year's bike-a-thon had an added goal of supporting cyclists in Armenia.

Veteran riders from the Abovyan Cycling School and the youngest of the young riders joined us at different stages of the ride. We stayed at an amazing hotel called "Maisian Kamurj" in Ijevan during our ride. The owner of the hotel, Mr. Vahagn, was extremely kind and generous toward us. For the price of an average dinner in Menlo Park, CA, we were fed 3 hardy meals a day and had comfortable beds to sleep on with unlimited access to the pool and game room.

Our ride started at the Haghartzin monastery on August 10, with a steep downhill to the main road. From there we rode to Ijevan on a relatively flat road with gentle hills. After dinner, Mr. Soloyan took us to the mountaintop Nor Varagavank monastery in the support van, something I personally welcomed. On the next day we rode to Goshavank and the day after to Makaravank, both extremely steep climbs. I confess, on some of the very steep parts I had to be rescued by the support van, but the boys were awesome and rode all the way.



Finishing at the Abovyan City Hall. Hon. Vahagn Gevorgyan in the middle in red shirt, to his right renowned cycling coach and leader of our ride, Mr. Albert Soloyan, and to his right the coach of the Abovyan cycling school, Mr. Armen Yeritsyan.

On the final day we rode to the city of Abovyan. The steep climb to Dilijan was a killer. Again I had to be rescued by the support van, but those boys, so tenacious and focused, completed the climb on their bikes. From Dillijan to Abovyan it was a relatively flat or downhill experience with just a few very shallow climbs which I managed. Upon entering the city of Abovyan the youngest of the Abovyan riders, ages 7 to 10 and no taller than the bikes they were riding, joined us. Together we rode to Abovyan City Hall where the mayor, the Hon. Vahagn Gevorgyan, welcomed us to his city.

We raised much needed funds for the CRD to repair a snow tractor (BOBR), which slid down the mountain to the valley below during this past winter's shift change to the Aragats Cosmic Ray Research station at 10,500 ft. elevation. Funds will also be used to support some of the championship level cyclists with needed equipment so that they can continue to raise the Armenian flag at cycling races with their medal-worthy performances

As we say each year, "This year's bike-a-thon was the best of all". We expect to top the experience next year and hope that many of you will join us to ride or to support the CRD scientists and the cycling athletes.

Yes, I want to promote Armenian science and education by supporting the excellent work of the dedicated scientists, engineers, technicians, & students of the Cosmic Ray Division of Artem Alikhanyan National Laboratory (also known as the Yerevan Physics Institute).

Name \_\_\_\_\_ Address \_\_\_\_\_

My contribution is in the amount of \$5000 \$2000 \$1000 \$500 \$200 \$\_\_\_\_\_

Please send this cut-out with your check, payable to **AESA-CRD** and mail to the Support Committee of Armenia's Cosmic Ray division at: **AESA-CRD, P.O. Box 655, Menlo Park, CA 94026**



## BOBR DOWN



Retrieving the BOBR snow travel vehicle from the valley below Mt. Aragats.

In 2010, CRD's good friends at the Armenian Scientists and Engineers of America, Michigan Section, bought a much needed snow travel vehicle for the Cosmic Ray Division's winter shift changes. The Russian-made vehicle, called a BOBR, served its purpose very well for the last 5 years.

Unfortunately, on April 20 during CRD's final winter shift change of 2015, the thick icy surface which had formed from periodic melting and freezing of snow, proved too much for the BOBR. It with 4 employees inside slid over 500 ft. from 9000 ft elevation down to the valley below.

The driver broke his arm in several places, and the others had to be treated for internal injuries. Only through sheer determination did they survive and exit the vehicle, getting to safety at the nearby town of Aparan. Thank God they are on the mend. Recovery, though slow, is progressing.

The dangers facing the CRD scientists are real, yet their determination to succeed amazes us all.

Now we intend to repair the BOBR or purchase a new vehicle before the first winter storms.

## 2016 CRD CALENDAR IS HERE!

CRD's calendar, *Spectacular Armenia 2016*, is ready thanks to CRD's graphic designer, Narine Khachatryan, and one of the founders of the Support Committee for Armenia's Cosmic Ray Division, Joseph Dagdigian. The calendar features breathtaking scenes from places most people don't know exist, the Cosmic Ray research stations on top of Mt. Aragats, and an amazing display of flowers at Tsitsernakabert on the 100<sup>th</sup> anniversary of the Armenian Genocide. CRD's Spectacular Armenia 2016 calendar is truly not to be missed.



2016 Spectacular Armenia Calendar  
available for purchase on the website and selected stores

The calendar is available from the [www.crdfriends.org](http://www.crdfriends.org) website; Armenian Vendor [armenianvendor.com](http://armenianvendor.com) website; NAASR in Belmont, MA (617 489-1610); ALMA in Watertown, MA (617 926-2562); Artbridge in Yerevan; at various Armenian events in the USA; or by calling Joseph Dagdigian (978 772-9417). Republic of Armenia commemorative stamp books celebrating CRD's achievements and Mt. Ararat and Mt. Aragats post cards are also available on the CRDFRIENDS website.

These items make perfect Christmas gifts for your Armenian and non-Armenian friends, while at the same time benefiting the work of the outstanding scientists, engineers and students at the CRD in Armenia.

Visit [www.crdfriends.org](http://www.crdfriends.org) for your gift-shopping needs.

**The Support Committee for Armenia's Cosmic Ray Division (SCACRD) operates under the umbrella of the Armenian Engineers and Scientists of America Inc. (AESA), a 501 (c) 3, tax-exempt (ID 95-3957498), charitable organization dedicated to promoting scientific and engineering excellence in the United States and Armenia. AESA has chapters in California, Michigan, New York/New Jersey, and the greater Metropolitan Washington DC area ([www.aesa.org](http://www.aesa.org)).**

**In Armenia, SCACRD operates under the umbrella of the Yerevan Physics Institute (YerPhI) named after Artem Alikhanian, a non-profit, non-governmental, independent organization dedicated to the promotion and funding of science and education for peace in Armenia ([www.yerphi.am](http://www.yerphi.am)).**

**AESA's and YerPhI's financial integrity are assured by annual audits in accordance with international standards by both the US Internal Revenue Service and the independent company Grant Thornton International respectively.**