CRD FRIENDS NEWSLETTER

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TEPA-2010 IN ARMENIA ATTRACTS TOP SCIENTISTS FROM AROUND THE WORLD

The **Thunderstorms and Elementary Particle Acceleration (TEPA-2010)** conference was held from September 6 through 11, 2010 at the Nor Amberd international conference center of the Cosmic Ray Division (CRD) of the Artem Alikhanyan National Laboratory (AANL), formerly known as Yerevan Physics Institute, in Armenia.

The conference was organized jointly by the CRD and the Skobeltsyn Institute of Nuclear Physics of Moscow State University. It was sponsored by AANL, the international Committee On Space Research (COSPAR), and the Armenian State Science Committee. Forty scientists and students from USA, Mexico, UK, Germany, Russia, and Armenia were in attendance. Top scientists from NASA, Max Plank Institute, Moscow State University, Durham University and, of course, the CRD, presented original research, dealing with the newly discovered global phenomena of particle acceleration and multiplication in the atmosphere. These phenomena can cause wide-ranging effects. The interaction of cosmic ray particles with thunderstorms, for example, can result in trapped electrons in the radiation belt circling the earth and causing problems for orbiting satellites.

Michail Panasuk, director of the Skobeltsyn Institute of Nuclear physics, Moscow State U.; Gerald Fishman, NASA-Marshall Space Flight Center; Ashot Chilingarian, director of Artem Alikhanyan National Laboratory and head of the CRD; Sir Arnold Wolfendale, British Royal Astronomer - at Aragats cosmic ray research station.

These effects can be understood only by studying solar-terrestrial interactions in their entirety and analyzing the mechanisms of solar energy transfer from the sun to the earth. This requires the integration of vast amounts of data and scientific knowledge across multiple disciplines. CRD is a leading contributor in this area of research.

The participants of the TEPA-2010 conference agreed to cooperate in this field of research by installing various sensors on the earth's surface and onboard orbiting satellites and to share their scientific discoveries.

The evening lectures by the best experts in the world were of particular interest to the ten CRD students, who were active participants of the conference.

THE SUPPORT COMMITTEE FOR ARMENIA'S COMSIC RAY DIVISION

CELEBRATES 10 YEARS OF PARTNERSHIP

WITH THE CRD AND THE DIASPORA

THANK YOU FOR YOUR SUPPORT!

SEVAN MONITOR FOR INDIA; SLOVAKIA NEXT

The *Space Environmental Viewing and Analysis Network, (SEVAN)* is expanding. India is the next country to install one of the *SEVAN* monitors.

SEVAN is the brain-child of CRD scientists who recognized the need for placing compact, stand-alone particle detectors around the globe to simultaneously measure the energy and direction of travel of different types of cosmic ray particles. These monitors are designed and made in Armenia and placed in countries wishing to participate in ground based space weather research. The inexpensive modules are financed by a variety of sources, including the receiving countries' science budgets, the European Office of the US Air Force, and the International Science and Technology Center (ISTC). The CRD contributes its scientific expertise to this research partnership and manages SEVAN's international on-line data sharing network. CRD's young scientists, engineers, and graduate students play a major role in designing these systems, traveling to participating countries to install *SEVAN* units and to train local scientists in their use.

SEVAN basic space weather monitor unit ready for India

In December, Karen Arakelyan, CRD's electronic engineer who designed the compact, state of the art *SEVAN* data acquisition system and CRD's PhD student David Pokhsraryan will travel to Delhi India to install and commission the newest SEVAN space weather monitor at the location prepared by the School of Environmental Sciences (SES) of Jawaharlal Nehru University (JNU).

The next *SEVAN* detector is planned for Slovakia. The funding sources for this partner are completing their final reviews prior to approval. Currently *SEVAN* monitors are operating in Armenia, Bulgaria, and Croatia. China and Israel have built their own monitors. The *SEVAN* monitors are also proving useful in the area of research dealing with the acceleration of elementary particles in the upper, middle, and lower atmosphere and their effects on thunderclouds. This new area of research has captured the attention of top scientific organizations in the world. CRD is at the forefront of this new area of research as well.

CRD STUDENTS AT THE RUSSIAN COSMIC RAY CONFERENCE

Professor Ashot Chilingarian and three CRD PhD students traveled to Moscow in July to participate in the Russian Cosmic Ray Conference held from July 5 through 9, 2010.

The conference focused on cosmic ray research in Russian and Armenian research facilities including the Lebedev Physics Institute of the Russian Academy of Science, Moscow State University, the Yakut Institute of Cosmophysical research and Aerospace, and the Cosmic Ray Division of the AANL in Armenia. CRD student researchers Bagrat Mailyan, Armen Hovanissyan, and Levon Vanyan, under the leadership of Prof. Ashot Chilingarian, presented their work on the acceleration of electrons in thunder clouds, a topic attracting the attention of the physics community around the world.

Karen Arakelyan preparing the CRD students for their presentations

PROF. CHILINGARIAN AT THE INTERNATIONAL COMMITTEE FOR SPACE RESEARCH (COSPAR) CONGRESS

Shortly after the conference in Moscow, Prof. Ashot Chilingarian, the head of the CRD, attended the international Committee On Space Research (COSPAR) congress in Bremen, Germany, from July 18-25, 2010. He reported on the latest developments of the *SEVAN* network. COSPAR focuses on all space related research and has been one of the key sponsors of the conferences held at CRD's Nor Ambert conference center on Mt. Aragats during the past four years. Prof. Chilingarian met with noted Armenian physicists Dr. Razmik Mirzoyan of Max Plank Institute in Germany, and Prof. Vahe Petrossian, head of Astronomy in Stanford University's Physics Department.

A. Chilingarian, R. Mirzoyan, V. Petrossian at COSPAR

AESA-MICHIGAN SECTION BUYS A VEHICLE FOR WINTER SHIFT CHANGES

The BOBR-3409 snow vehicle for safe winter transport.

The members of the Armenian Engineers and Scientists of America Michigan Section (AESA-MI) have been working diligently to identify and evaluate the best winter shift change all-terrain snow vehicle for the CRD.

Winter shift changes to CRD's high altitude research station on Mt. Aragats (10,500 ft elevation) are treacherous and dangerous, taking up to 12 hours to complete. Often sudden severe weather forces the abandonment of the ascent and the crew returns to the lower station to try again when the weather improves. The previous vehicle used for winter shift changes was 40 years old and more than once it broke down during the journey necessitating dangerous rescue missions.

Mr. Harutyun Vaporciyan of the AESA-MI Section spent endless hours searching the internet, talking with various companies around the world, and negotiating prices. The BOBR-3409 made by the Russian GAZ company was selected as the best option. Generous Diaspora donors, through AESA-MI, paid for this very important piece of equipment which was delivered to the CRD in January 2010. Many thanks from the CRD staff.

BIKATHON BENEFITS THE WORK OF THE COSMIC RAY DIVISION SCIENTISTS

Hope For Armenia Bikathon 2010 participants, Vatche Soghomonian in the front, Saro Hartunian in yellow, and Seth Setrakian, riding to support the CRD.

On July 8, 2010, the bikathon riders left Yerevan's Republic Square for a five-day grueling ride from Yerevan to the CRD stations at 6,500 ft. and 10,500 ft. elevation on Mt. Aragats, then to Vanadzor, Dilijan, Echmiadzin, and back to Republic Square on July 12. The riders spent one day hiking to the summit of Mt. Aragats, as if riding up to 10,500 ft was not exercise enough.

Saro Hartunian from New Jersey and Seth Setrakian from New York, under the leadership of Vatche Soghomonian from Fresno, had two goals in mind: to draw attention to the importance of the work of the CRD scientists and to support them financially with pledges from their sponsors.

The riders accomplished both goals with flying colors and raised $12,000 which was critical for completing the summer repairs at CRD's research stations. Severe mountain storms inflict a beating on all the buildings and repairing them in the summer is a critical annual exercise.

Thank you to the all riders and their sponsors.

☐ 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 (formerly Yerevan Physics Institute).

Name _____ Address _____

My contribution is in the amount of ☐$2000 ☐$1000 ☐$500 ☐$200 ☐$100 ☐$_____

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

AESA – NY/NJ HOSTS SCACRD FOUNDERS; AESA – HEADQUARTERS GETS AN UPDATE

On May 20, 2010, over 40 noted Armenian engineers, scientists, professionals, and students filled room 826 of Columbia University's Mudd Hall for a two-hour discussion on science in the Republic of Armenia. This forum focused on the CRD with founders of the Support Committee for Armenia's Cosmic Ray Division, Anahid Yeremian and Joseph Dagdigian as guest speakers. The conferees heard about the pioneering work of the CRD in Armenia, its importance to Armenia, and CRD's contributions to the international scientific community. The presentation was followed by a lively discussion. The one-hour presentation was preceded by an informal reception, celebrating the first-year anniversary of the AESA-New York/New Jersey Section of the AESA. (http://groups.google.com/group/aesa-ny-nj)

On September 14, the AESA (www.aesa.org) headquarters in Glendale, CA hosted Anahid Yeremian to make an illustrated presentation titled "*Showers from Space, the Electric Sky; CRD at the Forefront of Both*." The participants included students, engineers, and scientists from the community. This was the 6th presentation about the CRD organized by the AESA headquarters since 2000 when the AESA became an umbrella for the Support Committee for Armenia's Cosmic Ray Division. Anahid updated the community on the most recent developments at the CRD in the exciting field of space weather and particle acceleration and multiplication in the upper and lower atmosphere.

2011 CRD CALENDAR ISSUED!

CRD's best ever calendar, *Spectacular Armenia 2011*, is ready, thanks to the efforts of CRD's graphic designer, Narine Khachatryan, and one of the founders of the Support Committee for Armenia's Cosmic Ray Division, Joseph Dagdigian. The *Spectacular Armenia 2011* calendar features photographs from different regions of Armenia. You can visit Armenia every day by paging through this calendar on your wall. The Tigran Medz printing house in Yerevan printed the calendars. CRD staff members and Diaspora supporters submitted the superb photographs. Our thanks to Prof. Ashot Chilingarian, Dr. Arthur Reymers, Dr. Suren Chilingarian, Narine Khachatryan, and Joseph Dagdigian for photo contributions.

2011 Spectacular Armenia Calendar
available for purchase on the website and selected stores

The calendar is available from the **www.crdfriends.org** website and will also be sold during various Armenian events in the USA. Republic of Armenia commemorative stamp books celebrating CRD's achievements, and Mt. Ararat and Mt. Aragats post cards are also available. These items make perfect gifts for your Armenian and non-Armenian friends. Proceeds from these sales directly benefit the work of the outstanding scientists at the CRD.

Visit **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).

In Armenia, SCACRD operates under the umbrella of the National Foundation for Science and Advanced Technology (NFSAT), a non-profit, non-governmental, independent organization dedicated to the promotion and funding of science and education for peace in Armenia (www.nfsat.am).

AESA's and NFSAT's financial integrity are assured by annual audits in accordance with international standards by both the IRS and the independent company Grant Thornton International.