

# Thunderstorms and Elementary Particle Acceleration (TEPA-2014)



## GENERAL INFORMATION:

**Dates:** September 22-26, 2014

**Location:** Nor Amberd International Conference Centre of the Yerevan Physics Institute,  
Byurakan, Aragatsotn District, Armenia;

**Symposium website:**

<http://crd.yerphi.am/Conferences/tepa2014/home>

**Organizers:**

Cosmic Ray Division of Yerevan Physics Institute, Armenia

Skobeltsyn Institute of Nuclear Physics of Moscow State University, Russia

## INTERNATIONAL ADVISORY COMMITTEE:

- *Ashot Chilingarian, Yerevan Physics Institute, Armenia, co-chair*
- *Lev Dorman, Israel Cosmic Ray Center and Emilio Segre' Observatory, Israel*
- *Joe Dwyer, Florida Institute of Technology, USA*
- *Gerald Fishman, NASA-Marshall Space Flight Center, Huntsville, USA)*
- *Hartmut Gemmeke, Karlsruhe Institute of Technology, Germany*
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- *Alexandr Lidvanski, Nuclear Physics Institute, Russian Academy of Science, Russian Federation*
- *Jean Lilensten, Institut de Planétologie et d'Astrophysique de Grenoble, France*
- *Evgeny Mareev, Institute of Applied Physics, Nizhny Novgorod, Russian Federation*
- *Razmik Mirzoyan, MPI, Munich, Germany*
- *Yasushi Muraki, STE laboratory, Nagoya University, Japan*
- *Michail Panasyuk, Moscow State University, Russian Federation, co-chair*
- *Marco Tavani, INAF and University of Rome "Tor Vergata", Italy*

- *Tatsuo Torii*, Japan Atomic Energy Agency, Tsuruga, Japan
- *Harufumi Tsuchiya*, Cosmic Radiation Laboratory, Riken, Japan.
- *Lev Zeleny*, Space Research Institute, Russian Academy of Sciences, Russian Federation

## **BACKGROUND:**

The research on high-energy phenomena in thunderclouds is entering an intensive development stage. New satellite and balloon missions are being prepared exclusively for the detection of optical, radio, and gamma ray emissions from thunderclouds. New research groups from several countries worldwide are installing surface-based particle detectors for TGE detection. New models aimed to explain TGF and TGE events are currently being developed and tested. A vast amount of experimental evidence on TGE and TGF is available for tuning the models and for consistency checks on individual observations. The spatial and energetic characteristics of extensive cloud showers and the measured energy spectra of the TGE gamma rays and electrons may be used for checking characteristics of the particle fluxes obtained by the TGF simulations.

The study of high-energy phenomena in the atmosphere provides unique information about particle acceleration and multiplication in the lower and upper atmosphere during thunderstorms. Generation and propagation of large fluxes of electrons, positrons, gammas, and neutrons in the atmosphere and in near space are related to the development of thunderstorms and may be used for monitoring dangerous consequences of extreme weather. Electromagnetic emissions connected with thunderstorms trigger various dynamic processes in the Earth's magnetosphere, causing global geoeffects and changing electrodynamics properties of the ionosphere. The large fluences of energetic electrons, photons, and neutrons produced by runaway electron avalanches can potentially be a danger to aircraft crews, passengers, and onboard electronic systems.

## **STRUCTURE OF THE SYMPOSIUM:**

We anticipate following sessions:

1. *Research of the Thunderstorm ground enhancements (TGEs)*
2. *Research of the Terrestrial gamma-ray flashes (TGF)*
3. *Atmospheric High-energy phenomena observations by space- born facilities*
4. *Instrumentation*

we plan as well discussions on the most intriguing problems of high-energy physics and on possible directions for the advancement in research and collaborative studies.

Following topics will be covered during oral and poster sessions:

- *Research of the Thunderstorm ground enhancements (TGEs), measurements of electrons, gamma rays and neutrons by networks of particle detectors located on Earth's surface;*
- *Research of the Terrestrial gamma-ray flashes (TGFs) observed by the orbiting gamma-ray observatories;*
- *Radio emissions produced by atmospheric discharges and particle fluxes;*
- *Monitoring of thunderclouds from orbit;*
- *Methods of the remote sensing of the thundercloud structure and electric field;*
- *Relation of the lightning occurrences to the TGE and TGF initiation;*
- *X-ray emissions from the lightning;*
- *Relations to the climate and space weather issues;*
- *Possibility of joint observations by space-born and ground-based facilities.*

## **ATTENDANCE LIMITATION:**

Due to the size of the venue and other restrictions, the number of participants will be limited to 40. Therefore, participation in the Symposium is by invitation only. Registered personnel need to submit an abstract to receive an invitation.

## **ABSTRACT SUBMISSION:**

Abstracts should be submitted electronically on the Symposium website. The deadline for abstract submission is 30 July 2014.

## **REGISTRATION:**

Registration to **TEPA 2014** should be done online via the Symposium website. We will provide participants with their own account on Symposium website. These accounts will serve for the submission of abstracts, papers for Symposium proceedings and for providing information about accompanying persons.

**TEPA-2014** got financial support from European Geosciences Union (EGU). This support will be used to wave conference fee of young researchers and students. For other participants registration fee is 250 Euro. The fee covers the cost of transportation from and to airport, coffee breaks, as well as the Reception the Banquet, and excursions. Payment of the registration fee will be accepted at the Symposium desk upon arrival.

## **CONFERENCE DEADLINES:**

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| - 30 July 2014   | Abstract submission deadline                                 |
| - 15 August 2014 | Contributed presentations selected and participants notified |
| - 30 August 2014 | Symposium program in the conference site                     |

## **TRANSPORTATION AND LODGING:**

The organizers will provide transportation from/to the Yerevan Airport “Zvartnots”. Information on the arrival date, time and flight number should be sent to the Local Organizing Committee. During the Symposium the participants will be accommodated at the hotels in Nor Amberd International Conference Center of Yerevan Physics Institute, located on the slopes of Mount Aragats near the village of Byurakan, Aragatsotn District, Armenia. The Center has a rich tradition of hosting high-energy physics schools and is well equipped for international forums.

## **CORRESPONDENCE:**

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