

Travel report of A. Chilingarian, July 13-23
Participation in the 37th COSPAR (Council of the Committee on Space Research) Congress in Canada

37th COSPAR (Council of the Committee on Space Research) Congress in Canada is the greatest event since COSPAR started in 1960. 2,500 scientists and students from 50 countries will present 1,500 reports in more than 87 sessions covering all topics of Space Research: from planetary protection till jet dynamics in Supernovae explosions. I will attend the following sessions:

- H0– Astroparticle physics;
- D12 - Heliophysical processes: After the International Heliophysical year 2007; D22- New views on the Sun-Earth connections, Multispacecraft Imaging and in situ observations;
- D23- Energetic Particle Events – Past, Present, Future;
- E13 – Astrophysical shocks: Space Observations vs. Modelling;
- E12 – High Energy Acceleration processes in Supernova Remnants, PWEe, Microblazars and Binaries: the keV to TeV connections;
- PSW1 – Space Weather: Preparing to the next solar maximum.

Among numerous new observations and concepts I can emphasize:

New concept of particle acceleration in the solar flares during magnetic reconnections. Reconnection was occurred not in the unique, but in numerous sites in the active regions with enhanced magnetic field on the sun surface and in the corona. Numerous reconnection sites form an archipelagoes of islands with distinct borders and particle acceleration took place when electrons and ions cross this borders. This region above roots of magnetic loops in corona is site of particle acceleration and is seen in the high energy roentgen radiation by satellite X-ray observatories. The loops connected reconnection region and chromospheres are regions of particle trapping: due to magnetic pressure particles approaching sun surface are directed backward to the reconnection region and so on till there energy reached rather high values or till magnetic field lines opened.

The X-ray satellite observatories and gamma-ray Cherenkov atmospheric telescopes present new prove of magnetic field amplification in Supernovae Remnant till 0.2 mg due to nonlinear particle-plasma interactions and rather detailed morphology of the SNR I X-rays, gamma-rays and radio waves.

Multivariate campaigns of the stellar objects observations prove to me extremely successful in new physical inference and model selection. The Inverse Compton scenario of the TeV gamma-rays origin can be excluded, and, therefore prove of Hadronic nature of TeV gamma-rays from SNR can be accepted as most probable one. It is very exciting achievement: after exploring cosmic ray flux ~100 years ago and after 50 years of intensive experimentation with surface air shower arrays, modern experimental techniques finally establish the origin of cosmic rays.

I will present the following reports:

- "Surface Particle Detectors in Space Weather forecast" has been accepted and scheduled for an oral presentation in scientific event PSW1;
- "SEVAN particle-detector network located at Middle-Low latitudes for Solar Physics and Space Weather research" has been accepted and scheduled for an oral presentation in scientific event D12;
- "Research of the Galactic Cosmic Rays from "knee" till "cutoff" (1017-1019) eV at Aragats Cosmic Ray Observatory" has been accepted and scheduled for an oral presentation in scientific event E19.

On July 20 I participated in COSPAR assembly meeting as Armenian representative to this organization. During meeting was decided that COSPAR will support the conference in Armenia: Forecasting of the Radiation and Geomagnetic Storms by networks of particle detectors (FORGES-2008), September 29 - October 3, 2008, International Conference Center, Nor Amberd, Armenia

The topic of meetings was directly connected with A1554 ISTC projects goals. During numerous discussions I came to conclusion that goals of A1554 ISTC project and their planned realization summarized in the working plan are sound, very timely and achievable.

During collaboration meetings with colleagues from on-going CRD international projects: (FP7 NMDB and INTAS) we discussed current status of joint research and planned new meetings and publications.

Manager of the A1058 project
A.Chilingarian 22.07.08