

**A.Chilingarian's report on participation in Management Committee Meeting COST Action ES0803 "Developing Space Weather Products and Services in Europe" Italy, 1 -3 April 2009;  
Meeting of the INTAS collaboration N 06-100017-8777, "Solar and Galactic Cosmic Ray Particle Acceleration and Modulation";  
Meetings in Frascati and DESY accelerator centers, April 5-9.**

COST (European Co-operation in the field of Scientific & Technical Research) was founded in 1971. COST is an intergovernmental framework allowing the co-ordination of nationally funded research on a European level:

- Today it has almost 300 Actions and involves nearly 30,000 scientists from 34 European member countries and more than 80 participating institutions from 11 non-member countries;
- COST is based on Actions. These are networks of co-ordinated national research projects in fields, which are of interest to a minimum number of participants (at least 5) from different member states. The Actions are defined by a Memorandum of Understanding (MoU) signed by the Governments of the COST states wishing to participate in the Action. The duration of an Action is generally 4 years;
- Annual ~€120 000 per Action is basically used to cover co-ordination costs such as contributions to workshops/conferences, travel costs for meetings, contributions to publications and short term scientific missions of researchers to visit other laboratories, Conference grants for early stage researchers (PhD +<10 years), students summer schools.

The **COST Action ES0803 "Developing space weather products and services in Europe"** has the primary goal to form an interdisciplinary network between European scientists dealing with different issues of Geospace, as well as warning system developers and operators, to: Foster the ties between European Geospace research and space technology establishments, Assess the European potential in advanced Space Weather observational and modeling techniques and in reliable products and services Define the needs of a broad range of users and Determine and recommend the specifications for new products and services that best meet the users requirements.

At the management committee meeting April 3, 2009 Armenia was accepted as associated member of the COST action. Decision of the management committee should be approved by the COST office in Brussels.

The meeting of the **INTAS collaboration N 06-100017-8777, "Solar and galactic cosmic ray particle acceleration and modulation"** was held in Italy due to participation of the all principal investigators in the COST action.



**Figure 1** INTAS consortium, from left to right: Prof. Dr. Rainer Hippler, Institut fur Physik, Universitat Greifswald; Prof. Lev I. Dorman, Tel Aviv University, Technion, and Israel Space Agency; Prof. Erwin O. Flueckiger, Physikalisches Institut, University of Bern; Prof. Ashot Chilingarian, Yerevan Physics Institute.

### **Visit to Frascati accelerator facilities**

The Italian National Institute for Nuclear Physics (INFN) is realizing in the Frascati National Laboratory several programs using particle accelerators. In domain of high energy physics it is first of all extremely precise study of the different decays of Phi and K mesons at DAFNE experiment, which will deliver new data on the CP violation and K meson physics with unique characteristics of energy resolution. A second experiment, FINUDA, will be installed on one of the two interaction straights of the DAFNE main rings to perform studies on the spectroscopy and decay modes of hypernuclei, e.g. special nuclei, where a nucleon is replaced by a baryon made up of "strange" quarks (Lambda, Sigma, Csi).

Besides high energy physics, a large assortment of particle accelerators is designed and fabricated for producing a variety of beams for the applied science and industry.

Excimer lasers laboratory produce excimer laser-facility named Hercules and a laser-driven point-like plasma source tuneable in the extreme UV and soft X-ray spectral region. Excimer Laser facility (10 J/pulse, 10 Hz), is a pulsed X-ray source emitting in the range between 70 eV and 1200 eV, a Linear Accelerator (5 MeV, 160 mA, 20 Hz) and a mm-wave FEL (2-3 mm, 1.5 kW - 4 ms pulse, 10 Hz).

The Free Electron Laser (FEL) Laboratory is operating in the mm-wave region (2.1 - 3.6 mm, infrared spectral region) and is being extended in the Far Infrared Region (FIR) down to (400 mm). A new device is presently under construction, based upon the new concept of "phase matching" between energy and phase of the e-beam that will generate high power coherent FIR radiation without the use of a resonator.

In the Frascati accelerator facilities have been performed studies of:

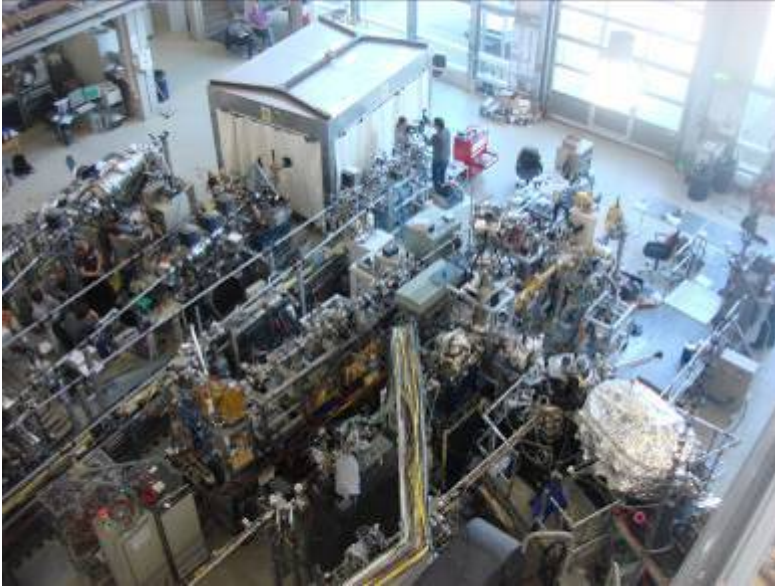
- solid state physics;

- superconductivity and spectroscopic experiments in the FIR and mm-wave region;
- investigations of the spectral range between approximately 30 GHz and 10 THz for telecommunication purposes;
- to develop techniques imaging techniques for medical diagnosis and therapy;
- research on THz and far infrared radiation influence on biological structures: cells, cell membranes, DNA, and proteins.

On the same way, although on much greater scale are new DESY accelerators. DESY is concentrated now on the production of very powerful beams for different scientific and industrial applications. After closing in 2007 HERA accelerator the high energy physics activity is shifted mostly on the data analysis and participation in LHC experiments. Only one high energy physics experiment with small budget is under consideration now. The Massachusetts Institute of Technology (MIT) propose to use DORIS storage rings to check positron-electron asymmetry in studding scattering on fixed target with OLYMPUS detector. Collaboration spokesman prof. R.Milner and chair of DESY directors board prof H.Dosch invited YerPhI to take part in this experiment planned in 2012.



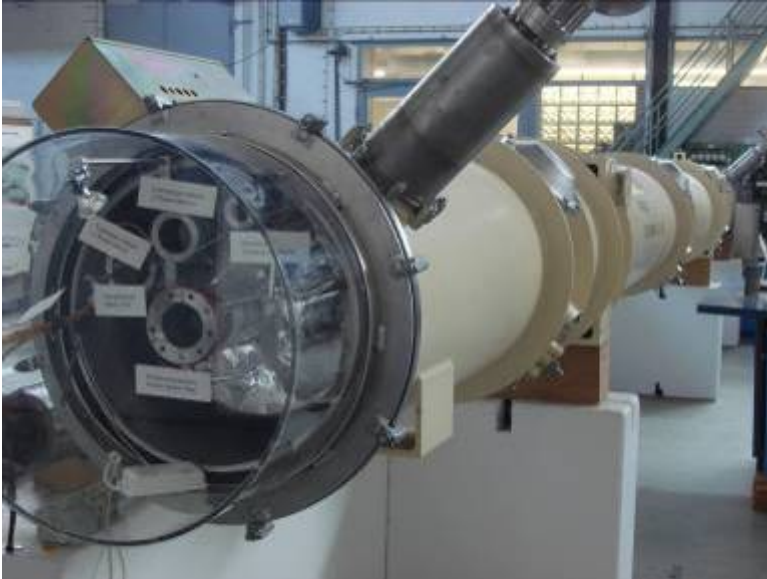
**Figure 2 ARGUS spectrometer at the DORIS storage rings; to be changed by OLYMPYS detector from MIT.**



**Figure 3** Five ongoing experiments on the FLASH FEL facility. Intensive energetic X-rays are used for different experiments in structure research, nanotechnologies, biotechnologies, etc...



**Figure 4** The new built experimental hall on PETRA 3 storage ring for providing 14 beams of brilliant X-ray beams for application ranging from condense matter studies till medicine. On 21 January the first of the 14 undulator magnets that will generate the brilliant X-ray light for PETRA III was installed in the 300-metre-long experimental hall.



**Figure 5** The superconducting acceleration section for XFEL facility designed and testing now by the TESLA collaboration



**Figure 6** Starting of excavations of the XFEL channel: the entrance at DESY the end of channel will be 3 km further in Schleswig-Holstein. Channel will go 35 meters under surface; construction planned to be finished in 2012 and acceleration sections also should be ready for this time.



**Figure 7** Group of YerPhI technicians and DESY staff in the underground hall of HERA-B experiment on HERA accelerator. For one month YerPhI employees helped DESY in dismantling the experiment already finished. Their work was highly valued by DESY administration. Some electronics parts from abandoned experiment were collected and stored for later transportation to Yerevan. Electronics will be used for preparing classes for Yerevan State University students in new forming Space Education Center of YerPhI.