



# The International Heliophysical Year (IHY)

A regional program of scientific research

## BALKANS, BLACK SEA AND CASPIAN SEA REGIONAL NETWORK

Armenia, Azerbaijan, Bulgaria, Croatia, Georgia, Greece, Romania, Russia, Serbia, Turkey, Ukraine

### ORGANIZATIONAL

- Balkan/Black sea/Caspian sea network for space weather studies
- National coordinators to contact other interested people/institutions to coordinate the activities
- Web-site:** [www.stil.bas.bg/IHY](http://www.stil.bas.bg/IHY)  
[www.ihy2007.boun.edu.tr](http://www.ihy2007.boun.edu.tr)  
[www.shao.az/IHY](http://www.shao.az/IHY)
- regional and worldwide IHY activity
- scientific database
- educational outreach

### PROBLEMS

- Educational materials (papers, movies, etc.)
- Travel grants
- New instruments and upgrade of existing instruments
- European and international programs (FP7, INTAS, ...)

### ARMENIA

Space Environment Viewing and Analysis Network (SEVAN)



Memorandum of Understanding on the Cosmic Ray Division (CRD)

Alikhanyan Physics Institute contribution to the United Nations Basic Space Sciences Initiative

### GEORGIA

Abastumani Astrophysical Observatory – AbAO (Mt. Kanobili)  
Georgian National Astrophysical Observatory base-ground telescopes  
*Solar investigation*  
*Upper atmosphere investigation*  
Ionosphere Observatory of Tbilisi State University (Tbilisi - Georgia)  
Michael Nodia Institute of Geophysics (Tbilisi – Georgia)

### ROMANIA

#### Financial supported projects :

- # Project EFYRA - coordinator Cristiana Dumitrache
- # Project PROTEL - coordinator Petre Popescu
- # Project HELGA - coordinator Nedelia Antonia Popescu
- # Astronomy and World Heritage - Magda Stavinschi
- # VIS-SHP - coordinator Vasile Mico
- # Solar Research Theme - Dynamic processes in solar atmosphere and heliosphere - coordinator Cristiana Dumitrache

#### International initiatives :

- # Workshop on "Flows, Boundaries, Interactions", Bucharest, 3-5 May 2007
- # Young Scientists International School on "Heliosphere and Galaxy", Bucharest, 3-5 May 2007

### NETWORK ACTIVITIES

#### SCIENTIFIC

##### • Research Proposals

- The physics of solar eruptive events and which ones are potentially hazardous;
- Atmospheric changes caused by solar UV irradiation variability at different time-scales;
- Comparative study of geomagnetic, ionospheric and seismic effects of Coronal Mass Ejections and High Speed Solar Wind;
- Participation in the scientific program of RAS
- Use of the radioastronomical data for space weather forecast
- Ionospheric disturbances above Vrancea epicenter

##### • Deployment of instruments (cosmic ray monitors, Doppler radioreceivers...)

##### • Bilateral and multilateral collaborations

- **Databases** (cosmic rays, high speed solar wind, solar flares, CME's)
- **Annual regional meetings/conferences**
- First regional meeting – June 2005, Sozopol, Bulgaria
- Second regional meeting - 30 March – 1 April 2006, Antalya, Turkey
- Third regional meeting – June or September 2007, Baku, Azerbaijan
- **Annual regional Summer/Winter Schools on Solar-Terrestrial Physics**
- August 2006 – Odessa, Ukraine – VI Gamov summer astronomical school
- June/September 2007 – Shamakhi, Azerbaijan
- IV Summer Astronomical School on Solar and Solar-Terrestrial Physics

### AZERBAIJAN

solar-terrestrial relations

"Working Group on Study of Solar-Terrestrial Relations" in the Azerbaijan National Academy of Sciences.

Space Weather effects and SW influences on the different technological and biological systems, including the human life and health;  
influence on technical, engineering and ecological systems (scintillation of microwave radio signals, oil production activity and functioning of oil-gas transportation pipelines, electric power grids, Caspian Sea level, climate, traffic, plants, beekeeping, etc.);  
affects on human life and health (virus-epidemic diseases, human brain functional state, cardiovascular diseases, sudden cardiac deaths, ophthalmologic diseases, thalassaemia, etc.).  
Space weather education and outreach: special academic courses, mass-media, daily and weekly columns in newspapers, summer schools, young scientists conference

### TURKEY

#### Ongoing projects

##### COST 724 action:

"Developing the Scientific Basis for Monitoring, Modelling and Predicting Space Weather"

- METUNN and Cascade Modeling
- METU-Neuro-Fuzzy Network Modeling
- TY Genetic Programming

##### Flare Index Calculations

- <http://www.koeri.boun.edu.tr/astronomy/finde.html> (Kandilli Observatory)
- [http://ftp.ngdc.noaa.gov/STP/SOLAR\\_DATA/SOLAR\\_FLARES/INDEX](http://ftp.ngdc.noaa.gov/STP/SOLAR_DATA/SOLAR_FLARES/INDEX)

### EDUCATIONAL

- popular scientific articles – [www.shao.az/SG](http://www.shao.az/SG)  
written by members of the network in English, translated into local languages and published in local periodicals and online on popular websites  
"Sun's magnetism" – Marina Gigolashvili (Georgia)  
"Solar rotation" – Dragan Roša and Darije Maričić (Croatia)
- school competitions for high school students
- formulating problems for astronomy olympiads
- school competition for experiments aboard the ISS
- School/university satellites
- Looking for possibilities for training of young scientists from member countries in different participating institutions
- Tutoring and co-tutoring of PhD students by members of the network

##### International scientific journal

Vol.1 Nr.1 – proceedings of the first regional meeting (Sozopol, 2005)

Vol.1 Nr.2 & 3 – refereed proceedings of the second regional meeting (Antalya, 2006)

Vol.2 – refereed articles



### BULGARIA

Bulgarian Academy of Sciences

#### Institute of Astronomy

- Rojen observatory
- Belogradchik observatory

#### Solar-Terrestrial Influences Laboratory

- Stara Zagora observatory
- in situ measurements aboard the ISS during IHY

#### Institute of Space Research

##### Institute of Geophysics

- Sofia ionospheric station
- Pangyurishte magnetic observatory
- Sofia University – Center for Space Research
- Shumen University – Astronomical center
- 10 people's observatories with planetaria

### UKRAINE

National Academy of Sciences of Ukraine

- Main Astronomical Observatory (Kiev)
- Institute of Radio Astronomy (Kharkiv)
- Space Research Institute NSAU (Kiev)
- Lviv Centre of Institute of Space Research Institute (Lviv)
- Observatory "URAN-4" of Institute of Radio Astronomy (Odessa)
- Poltava Gravimetric Observatory of Institute of Geophysics (Poltava)
- H.V.Karpenko Physico-mechanical Institute (Lviv)

Ministry of education and science of Ukraine

- Crimean astrophysical observatory
- Kharkiv V. Karazin National University (Department of Space Radio Physics)
- Institute of Ionosphere (Kharkiv)
- Kyiv National Taras Shevchenko University (Astronomical Observatory)
- Odessa National I.I. Mechnikov University (Astronomical Observatory)

#### Proposals for IHY

- Development of a space weather forecast methods
  - Ionosphere disturbance above Vrancea seismic region
  - Decameter investigation of the Sun activity, solar wind, and ionosphere response