

# THE 50TH BIRTHDAY OF THE NAGYCENK OBSERVATORY AND THE INTERNATIONAL GEOPHYSICAL YEARS

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The whole activity of the 50 years old Nagycenk Geophysical Observatory (in its full name: Széchenyi István Geophysical Observatory of Hungarian Academy of Sciences) is closely related to international geophysical co-operations, and its history is milestone by such events as the International Geophysical Year 1957–1958 (the starting date), and the IGY+50 anniversary years, especially the Electronic Geophysical Year.

## Introduction: IGY and the Observatory

As evaluated 50 years later (at the US002 session of IUGG General Assembly in Perugia), the International Geophysical Year (IGY) has meant a remarkable progress to the scientific disciplines represented in IUGG. The polar regions, the deep oceans, the Earth's interior, its atmosphere and the space beyond were explored at an unprecedented rate. New technologies like satellites and computers facilitated measurements, data collection and analysis and were applied in a global effort and with an extraordinary station density.

The Nagycenk Geophysical Observatory (Ádám and Verő 1958, Ádám et al. 1981, Bencze and Márcz 1981, Verő 1996, 2001, 2002) is one of the direct products of the International Geophysical Year 1957–1958.

## IUGG/IAGA and the Observatory

Since that time, the Nagycenk Observatory has become an indispensable data source of earth science observations, related to electromagnetic phenomena in the Earth and in near-Earth space. By measuring the electromagnetic field on the Earth in a wide frequency range, the observatory data are relevant to the investigation of the following inter-related domains: Sun, interplanetary field, magnetosphere, ionosphere, atmosphere, Earth's crust, mantle and core, and their processes varying with time. (See the Annual Reports of the Observatory.)

The Institute, where the Observatory belongs to (Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences, [www.ggki.hu](http://www.ggki.hu)), all the three classical ways of scientific research: theory, numerical simulation and physical measurements are characteristic, and among the physical measurements the observatory measurements are our permanent data source (while the field works and the laboratory experiments are intermittent tools).

The name of the institute is "Geodetic and Geophysical", and the name of IUGG (founded in 1919, due to the activity among others by Baron Loránd Eötvös, but Hungary could become its member only in 1930) means International Union of "Geodesy and Geophysics" ([www.iugg.org](http://www.iugg.org)). The departments of the Geodetic and Geophysical Research Institute of the Hungarian Academy of Sciences (Geodesy, Seismology and Geophysics) are closely related to three of the seven (from 2007: eight) member associations of IUGG: IAG (International Association of Geodesy, [www.iag-aig.org](http://www.iag-aig.org)), IASPEI (International Association of Seismology and Physics of the Earth's Interior, [www.iaspei.org](http://www.iaspei.org)) and IAGA (International Association of Geomagnetism and Aeronomy, [www.iugg.org/iaga](http://www.iugg.org/iaga)). In such a way, the Geodetic and Geophysical Research Institute provides the largest component of Hungarian IUGG activities.

The Nagycenk Observatory is a part of the Geophysical Department. Activities of its three groups (Geomagnetism, Aeronomy and Electromagnetic induction) are related to all the five IAGA divisions. The research in Sopron (fedded, first of all, by observatory data from Nagycenk) has been recognised by the IAGA in a special way: the 11th IAGA Scientific Assembly will be held in Sopron, August 23–30, 2009 ([www.iaga2007sopron.hu](http://www.iaga2007sopron.hu), see in details in the Appendix).

### **IGY+50 and the Observatory**

The IGY+50 events in Hungary start with the 50th birthday of the Nagycenk Observatory, to be held together with the Hungarian launching event of international geoscience years of 2007–2009 (Annual Meeting of Hungarian Geologists and Geophysicists, September 19–22, 2007).

All over the world several initiatives have been formed to celebrate IGY+50: the most general one is the International Year of Planet Earth 2007–2009 ([www.yearofplanetearth.org](http://www.yearofplanetearth.org), Szarka 2006, Ádám 2007), which is a UN year in 2008. The International Polar Year 2007–2009 (Bindschadler 2007, [www.ipy.org](http://www.ipy.org), which

is actually the fourth polar year: the third one was a part of the IGY itself) investigates the two polar regions (including their electromagnetic phenomena), while the International Heliophysical Year 2007–2008 (e.g., Baker 2007, Kecskeméty 2007, [www.ihy2007.org](http://www.ihy2007.org)) focuses on the heliosphere, where the new word “heliophysics” is a generalization experiment of the word “geophysics”.

There have been and will be observatory-related events devoted to these three international geophysical years of 2007–2008, and also to the so-called GEOSS (Global Earth Observation System of Systems). However, the observatory has the closest relationship with the Electronic Geophysical Year ([www.egy.org](http://www.egy.org)), which is the IGY+50 initiative of IAGA.

It is self-understanding, that the Observatory has been and will be serving as a basis of international scientific co-operations. Its geomagnetic part, e.g., is a member of the IAGA-promoted INTERMAGNET network. Reports, research papers and rememberings in this book provide further examples.

### **Electronic Geophysical Year and the Observatory**

The Electronic Geophysical Year, 2007-2008 (*eGY*) provides an opportunity for the international geoscientific community to focus effort on a 21st Century e-Science approach to issues of data stewardship: open access to data, data preservation, data discovery, data rescue, capacity building, and outreach. (Barton 2007, Parsons 2007). The development of Virtual Observatories and Laboratories is a central feature of *eGY*. In the VxO series, where x denotes the physical parameter, we find the following international initiatives: VCO (Virtual Carbon Observatory), VGMO (Virtual Geomagnetic Observatory), VHO (Virtual Heliophysical Observatory), ViRBO (Virtual Radiation Belt Observatory), VMO (Virtual Magnetospheric Observatories), VOO (Virtual Ocean Observatory), VSN (Virtual Seismic Network), VSO (Virtual Solar Observatory), AVO (Astrophysical Virtual Observatory), while NVO will be the US National Virtual Observatory. The Nagycenk Observatory data are relevant to VGMO, VHO, ViRBO, VMO, and most probably to VSN.

### **Conclusions for the next 50 years**

The natural electromagnetic fields and their time variation contain information about the entire world, including the changing Earth and the whole heliospace. In order to understand e.g. the variable conditions in the near-Earth space (known as space weather), the energy coupling between the solar wind and the Earth's magne-

tosphere (which might influence the Earth's climate), or the geophysical processes within the Earth, such monitoring measurements, as have been carried out since the IGY in the Nagyecenk Geophysical Observatory, are absolutely indispensable: not only for the international scientific community, but also for the sustainability of human societies.

At the Perugia IUGG General Assembly the member associations gave an overview over the accomplishments in their fields during IGY and in the 50 years since. As Charles Barton, the resigning president of IAGA pointed out (Barton 2007): the question "What YOU have provided in terms of data to the scientific community?", will be more and more important in the future. The Nagyecenk Observatory gives to this question a reassuring answer.

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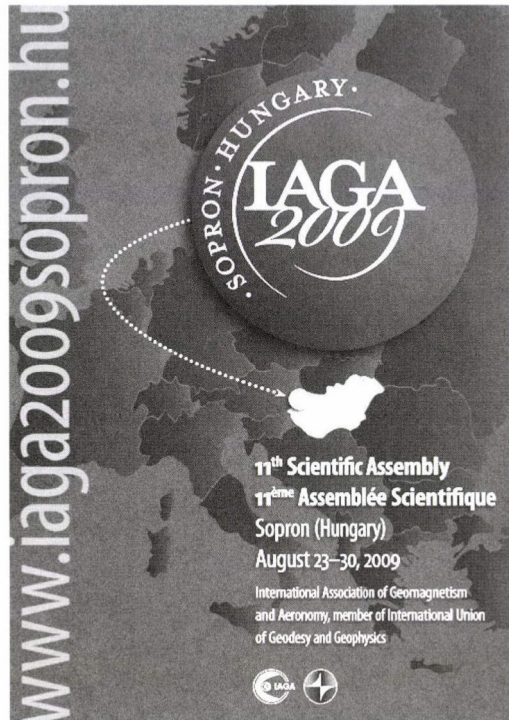
## Appendix – The 11th Scientific Assembly of IAGA

You are cordially invited to attend the IAGA 11th Scientific Assembly, to be held August 23–30, 2009 in Sopron, Hungary.

The Assembly will be held in the Liszt Ferenc Conference and Culture Centre (LFCCC) and nearby buildings (in the developing “Sopron Downtown Convention District”). LFCCC will serve as the headquarter (with the registration area, opening and closing ceremony, association lectures, and part of the sessions). The other part of the sessions and the poster presentations will be held in other buildings. All lecture and poster halls are within less than 5 minutes of each other on foot.

The scientific program of the meeting, which will cover all areas of IAGA science, will be defined by IAGA and its scientific bodies. It will be announced in the Second Circular, which will give all relevant information on how to submit an abstract and how to register for the meeting.

The scientific program starts on August 24 (Monday) and ends on August 29 (Saturday). The posters will be on show for six days, as well as the planned exhibition. About 600 oral presentations, 600 posters, and two association lectures are expected.



The poster of the Assembly (designed by Márton Juhász, University of West Hungary)

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