

ROMANIAN ACADEMY

ROMANIAN NATIONAL COMMITTEE OF GEODESY AND GEOPHYSICS

NATIONAL REPORT

ON GEODETIC AND GEOPHYSICAL ACTIVITIES

1999 - 2003

Prepared for the XXIIIrd IUGG General Assembly

SAPPORO - JAPAN

2003

BUCHAREST

2003

FOREWORD

The National Report of the Romanian Committee of Geodesy and Geophysics (RNCGG) prepared for the XXIII-rd General Assembly of IUGG aims at presenting the main directions and results of newly initiated and/or developed scientific researches of Romanian geoscientists, corresponding to the component associations, regarding the interdisciplinary study of the planet Earth.

In the framework of this volume, each section of the RNCGG has displayed, under the guidance of the national correspondents, the involvement of Romanian scientists and specialists in major national and international research projects, the organization of significant conferences and symposia, as well as the main topics discussed by the Romanian participants.

A selective bibliography is presented as an important part of every contribution within the National Report, allowing to those interested to continuously follow the development of the research projects as well as the involved working groups, in view of establishing contacts that we hope will prove to be mutually profitable in the next future.

This report, conceived as an ensemble that allows the interested reader to get an accurate image upon the activity in geodesy and geophysics in Romania, includes the interval 1999 - 2003, since the last IUGG General Assembly held in Birmingham, UK. The possibility of presenting a quite comprehensive volume is a consequence of the continuous improvements in the organizational policy of the RNCGG, by appointing a new national correspondent (IAG) as well as new members and secretaries of the associations' committees. Significant efforts and dedicated work have been provided by Dr. Constantin Sava, RNCGG Secretary General, by Dr. Dumitru Ioane, editor-in-chief, by Dr. Otilia Diaconu, who produced the CD version, and by all the associate editors. Their most important contribution is acknowledged and thanked.

The National Report represents also an homage to our dear professors and former presidents of the Romanian National Committee of Geodesy and Geophysics, founders of the Romanian school of geophysics, Acad. Sabba S. Stefanescu and Acad. Liviu Constantinescu.



Prof. Dr. Dorel ZUGRAVESCU

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FOREWORD

This report outlines Romanian activities in geodesy for the period 1999 - 2003. Geodetic activities during 1999 - 2003 were marked by the most important changes of Romanian society, combined with the new social and economical conditions, intensely influenced by the international policy frame, for integration of Romania in the European and Euro - Atlantic structures.

A very important factor in this period was the reorganization and consolidation of the responsible institutes for the geodetic activity, both at central level and in territory by removing the parallel structures. In present the National Office for Cadastre, Geodesy and Cartography (ONCGC) as a central public administration under the authority of Public Administration Ministry, took all the responsibility for coordination, leading and control of the cadastre, geodetic, topographic, photogrammetric, remote sensing and cartographic activities at national level.

The main activity was the contribution of the geodetic specialists in translating into practice the provisions of property laws (Law no. 18/1991 and Law no. 1 / 2000), where the geodesists carried out specific tasks and of large responsibility. A substantial contribution in this direction has brought by the specialists of ICGFC and by the 42 Country Offices of Cadastre, Geodesy and Cartography. The importance of this activity was emphasized also at the first National Symposium entitled "Cadastre - Modern technologies for determination, recording and evidence", organized in November 2002, having as organizers: ONCGC, Faculty of Geodesy from Technical University of Civil Engineering Bucharest, Union of Romanian Geodesy and the Association of Cadastre, Geodesy and Cartography Companies.

Even the fundamental research in the geodesy domain has stagnated in the last period, as a cause of social - economic priorities reminded above, the national committee IAG has the conviction that this will return soon at a proper level. The national report on geodesy has been divided into sections corresponding to the five sections of the IAG, namely:

Positioning
Advanced Space Technology
Determination of the Gravity Field
Theory and Methodology
Geodynamics

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International Association of Geodesy

IAG ACTIVITIES IN ROMANIA

1999 - 2003



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FOREWORD

The present report describes the activities carried out in Romania, under the supervision of the "Seismology and Physics of the Earth's" section of the National Romanian Committee of Geodesy and Geophysics, organized in four main domains: Seismology, Structure of the Lithosphere, Heat Flow Studies and Nonlinear Analysis and Modelling in Geodynamics.

Romania is characterized by relatively high seismic activity, experiencing 3-4 destroying earthquakes per century, concentrated mainly at the Carpathian Arc Bend, in the Vrancea region, in a particularly confined focal volume at intermediate depths. The strong earthquakes generated here are significantly affecting very extended areas in Europe. Since Seismology is a data-driven science, special efforts were put during the last decade to develop and improve the data management, including acquisition, processing and rapid exchange of seismic information. The National Institute for Earth's Physics is operating a telemetered network of 18 seismic stations for monitoring natural and induced seismicity, as well as a strong motion network of 39 high quality digital accelerometers (recently installed in the framework of the Romanian-German co-operation) and 18 SMA analog accelerometers.

In the field of seismological research, important achievements were obtained during 2000-2003 period in the following domains:

- monitoring of seismicity;
- seismic source physics;
- wave propagation;
- seismotectonics;
- seismic hazard of Romania by probabilistic and deterministic approaches;
- earthquake prediction;
- engineering seismology.

In the field of lithosphere structure the most significant results are referring to the deep structure of the lithosphere, determined from seismic data correlated with the available geophysical and geological data. Heat flow studies went on with interpretation of new geothermal data, acquired in the previous IUGG interval, in terms of tectonic evolution of crust and lithosphere of various tectonic units. Thermomechanical kinematic and dynamic modelling of the evolution and structure of the Carpathians and adjacent tectonic units, as well as retrieving information on past climate changes from borehole temperature data have been the main directions of development.

A very dynamic "entry" in the fields of interest of scientists involved in the study of the Earth, reported for the previous IUGG interval, namely the nonlinear analysis and modelling in Geodynamics, went on, the specific view on geodynamic phenomena and adequate tools to study complex geodynamic systems granting a separate section of the present report. The research concerned mainly the study of the structure and the dynamic behaviour of complex systems involved in seismogenic processes.

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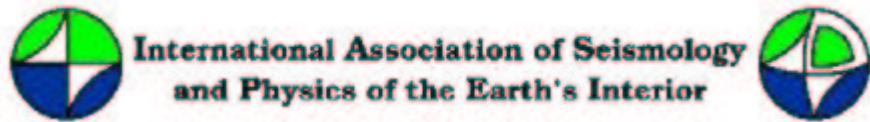
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International Association of Volcanology and
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**The International Association of
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IAMAS ACTIVITIES IN ROMANIA

1999 - 2003



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FOREWORD

The National Institute of Hydrology and Water Management (NIHWM), is a highly appreciated specialized institute in the field of hydrology and water management research-development and operational services.

NIHWM performs research, studies and technical assistance in the following domains:

- short, medium and long range hydrological forecasts;
- mathematical modeling and research for surface and groundwater resources (from quantity and quality point of view);
- water management and river basin master plans;
- environmental impact assessment;
- warnings for dangerous hydrological phenomena (flood, drought, accidental pollution, etc.);
- GIS applications;
- design and management of hydrological data base;
- management and prevention of crisis situations: floods, droughts;
- design and development of flood warning and forecasting informational systems;
- ecology;
- marine physics, coastal dynamics;
- development of software for computer modeling and
- other institutional aspects.

The specialists from the National Institute of Hydrology and Water management have a good experience in the co-ordination and participation in several national and international hydrological projects (PECO, LIFE, PHARE, NATO, EC, etc.).

NIHWM collaborates with educational institutions by delivering different educational activities in water sciences, offering consulting and expert services.

The main objective of NIHWM is to enhance transboundary cooperation and to implement the Danube River Protection convention and increasingly, the EU Water Framework Directive.

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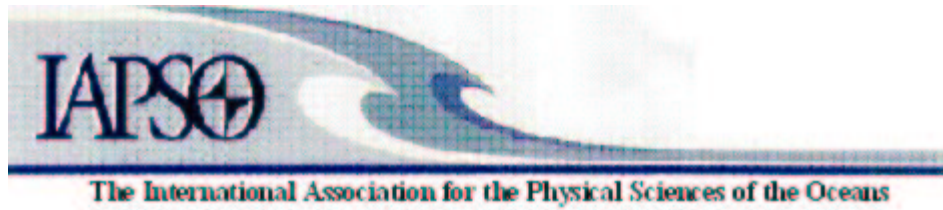
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