



Romanian Academy

Institute of Geodynamics "Sabba S.Ștefănescu"

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History and activity



Fig.1. Dorel Zugrăvescu, the Director of the "Sabba S. Ștefănescu" Institute of Geodynamics of the Romanian Academy.

The "Sabba S. Ștefănescu" Institute of Geodynamics of the Romanian Academy (IG"SSS"AR) - director Prof. Dorel Zugrăvescu, member of the Romanian Academy (Fig. 1) was constituted in 1990, simultaneously with the revival of the Romanian Academy, which became possible after the destructuring of the whole consisting of the Soviet Union and the countries in its orbit.

The Institute continues a tradition begun in the framework of the Geophysical Research Centre of the Romanian Academy when, on the occasion of the February 15, 1961, total solar eclipse, it may be considered that experimental Geodynamcis was introduced in our country. On the occasion of this eclipse, in a building belonging to the Căldărușani monastic complex (Fig.2) the first recordings of the variations in time of the gravitational field in our country were carried out, using as a sensor an Askania type gravimeter and recording systems of own construction. On the same occasion, recordings were carried out with a paraconical pendulum, also of own construction, made after the photos and details put at our disposal by Prof. Maurice Allais (Nobel Prize for Economy in 1988) who performed, with the

pendulum he had built, similar determinations, on the occasion of the solar eclipses in 1954 and 1958.



Fig. 2. The location of the Căldărușani Geodynamics Observatory in the framework of the Căldărușani monastic complex.

We underline the fact that at present, the Căldărușani Geodynamics Observatory is functioning in the building where these recordings were carried out

and that the co-operation established in 1961 between the *Căldărușani Monastery* - the **Romanian Orthodox Church** and the *Căldărușani Geodynamics Observatory* (the Geophysical Research Centre) - the **Romanian Academy**, was officially celebrated in 2001 (Fig. 3), at the anniversary of four decades of existence of the first and up to now the only co-operation established between one of the orthodox churches - the **Romanian Orthodox Church** - and science - the **Romanian Academy**.



Fig. 3. The signatories of the collaboration between the Căldărușani Monastery and the Căldărușani Geodynamics Observatory, on the anniversary of four decades of cooperation.

In time, after the dissolution of the Geophysical Research Centre of the Romanian Academy in 1970, the various administrative reorganizations which affected the research structure of our country led to the functioning of the *Căldărușani Geodynamics Observatory* as a research laboratory, first as part of the *Bucharest Astronomic Observatory* and then, for a short time, as part of the *Institute of Geology and Geophysics of the Ministry of Mines, Petroleum and Geology*. Subsequently, till the constitution, on its structure, of the "**Sabba S. Ștefănescu**"

Institute of Geodynamics of the Romanian Academy, the Laboratory of Geodynamics functioned in the framework of the **Centre of Earth Physics and Seismology**, together with a laboratory of seismology, which became in 1990 the National Institute for Earth Physics, a laboratory of rock mechanics and a research group for natural fields.

The Laboratory of Geodynamics and the research group for natural fields constituted the basic nucleus of the Institute of Geodynamics. This nucleus created, gradually, a material basis consisting, in the beginning, almost exclusively of specific geodynamics equipment, conceived and built in the framework of its own laboratories, sometimes also in co-operation with specialists belonging to other research groups from our country (institutes of the Romanian Academy, the Department of Geophysics of the University of Bucharest, research units from Physics Platform Bucharest-Magurele) and from abroad (the Royal Observatory of Belgium, l'Institut de Physique du Globe Paris - France, the Geodynamics Department of the Institute of Theoretical Geodesy, Bonn University - Germany, the Nagoya University - Japan).

An essential role for the evolution of research in geodynamics in our country has been played by the collaboration, doubled by unfailing friendship relations, established already since the sixth decade of the last century, with Prof. Manfred Bonatz, head of the Laboratory for Geodynamics in the Institute for Theoretical Geodesy of the University of Bonn, and Prof. Paul Melchior, at the time the Director of the Royal Belgian Observatory, today a baron ennobled by King Baudouin for his scientific merits.

These links have been strengthened in 1993 by a multilateral collaboration signed by representatives of the elite of European geodynamics (Prof. Paul Paquet, Prof. Bernard Ducarme, from the part of the Royal Belgian Observatory - Belgium, Prof. Manfred Bonatz, from the part of the Institute for Theoretical Geodesy of the University of Bonn - Germany, Eng. Jan Flick, from the part of the Walferdange Observatory - Grand-duché de Luxemburg, Prof. Dorel Zogrăvescu, from the part of the "Sabba S. Ștefănescu" Institute of Geodynamics of the Romanian Academy - Romania, prof. Jean Louis LeMouël, Membre de l'Institut, from the part of the

Institute of Earth Physics Paris - France), a collaboration financed by the European Community, which made possible:

- a better knowledge about the space-time evolution of certain parameters causally linked with the accumulation and the release of energy related to earthquakes in the zone of Vrancea, Romania;
- an extension and a development of the material basis dedicated to the study of the active geodynamic zone of Vrancea;
- the organization, in June-July 2000, of an European Mission of Geodynamics Fig. 4).



Fig. 4. The European Mission of Geodynamics - the itinerary.

Since its foundation, the Institute of Geodynamics "Sabba S. Ștefănescu" of the Romanian Academy focused its interest on fundamental research imposed by the tasks implied by the Priority Program of the Romanian Academy, "Complex geophysical research in geodynamically active areas concerning especially the Vrancea seismogenic area", regarding particularly:

- the study of space-time variations of some parameters causally linked to the cumulating of stresses responsible for earthquakes occurrence;
- crustal deformations monitoring (relative displacement of tectonic blocks);
- tectonic hazard studies;

- the monitoring of space-time variations of the gravitational, geomagnetic, geoelectric fields and of Earth crust tilts;
- the creation and permanent maintaining at an international level of a mobile specialized equipment for complex studies in geodynamically active areas (seismoactive areas, landslides, underground cavities collapses, areas that became geodynamically active because of anthropic activity);
- modeling of the thermo-mechanical evolution of the lithosphere;
- non-linear analysis of geodynamic systems.

At present, the Institute has a network of observatories and observation points, structured in profiles and geodynamics polygons, all having as a main purpose a better knowledge of phenomena leading to stress cumulating/ triggering in geodynamically active areas, with a special concern for the geodynamically active area of the Romanian Carpathians bend - the Vrancea seismogenic area, the network being concentrated in three geodynamics polygons: the Căldărușani-Tulnici Geodynamics Polygon, the Crăciunești-Deva, Sarmizegetusa Regia, Padeș-Gorj Geodynamics Polygon and the Danube Delta - Mangalia Geodynamics Polygon (Fig. 5).

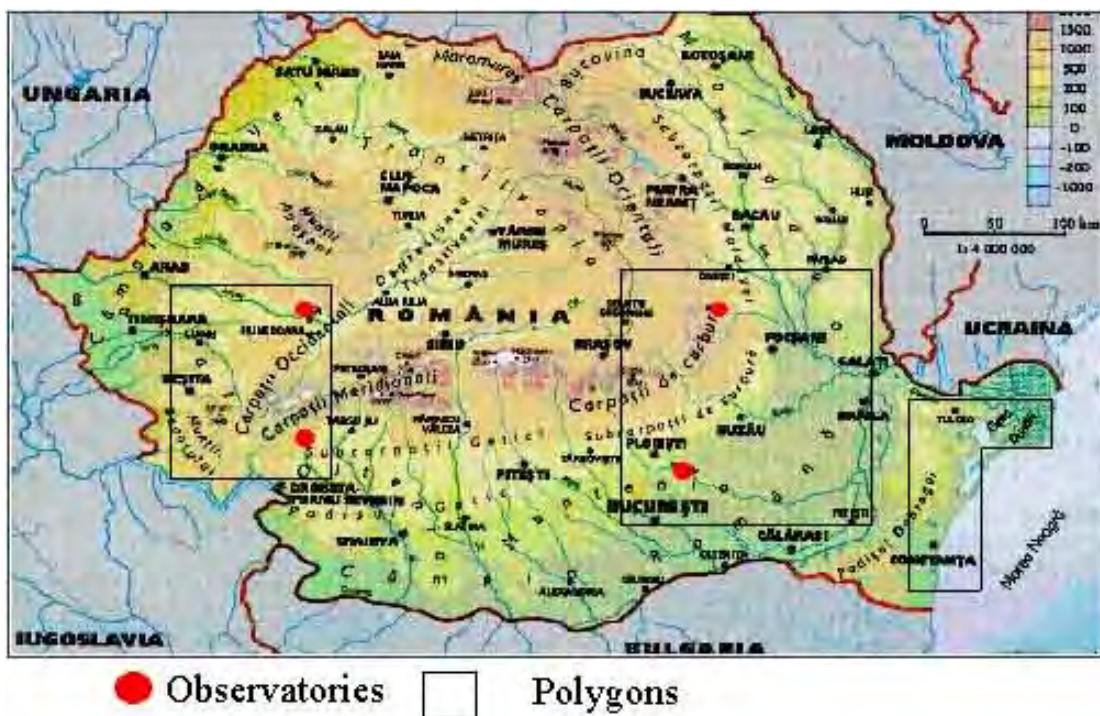


Fig. 5. The location of the geodynamics polygons of the "Sabba S. Ștefănescu" Institute of Geodynamics on the Romanian territory.

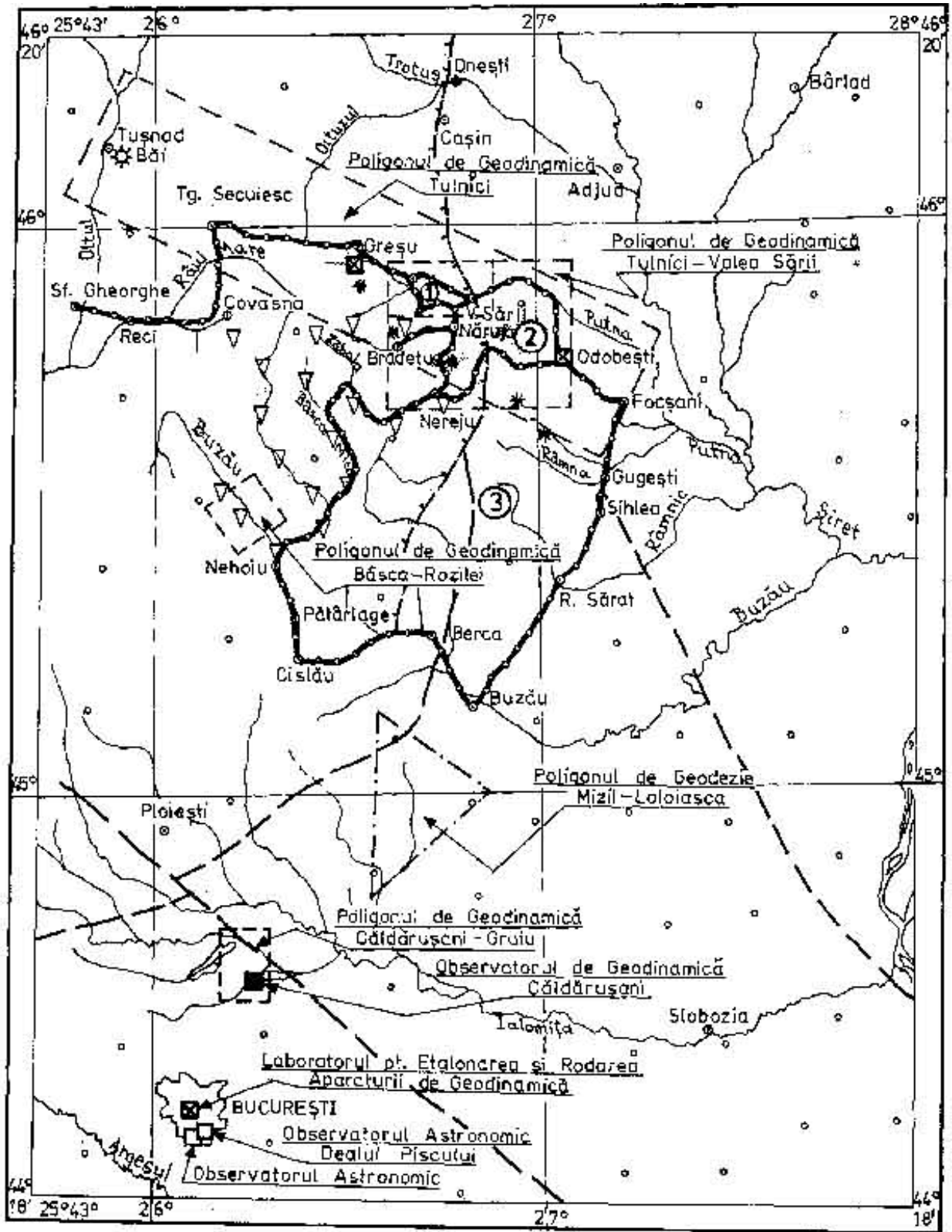


Fig. 6. Căldărușani-Tulnici Geodynamics Polygon

Among these polygons, a special place is occupied by the Căldărușani-Tulnici Geodynamics Polygon (Fig. 6) which includes - besides the laboratories for equipment gauging and aging, arranged in the framework of the Căldărușani Geodynamics Observatory, in the basement of the group of buildings that constitute the headquarters of the IG"SSS"AR (Fig. 7) and in the basement of the headquarters of the Romanian Academy - several micropolygons consisting of over 200 observation points, that allow the performing of repeated measurements, usually at 6 months up to 5 years intervals, and of underground laboratories, which allow data acquisition - within the limits of the possible, without interruption - corresponding to variations in the crust tilt and in the gravity, the magnetic and the electric fields.



Fig. 7. The "*Sabba S. Ștefănescu*" Institute of Geodynamics of the Romanian Academy: the headquarters in Bucharest.

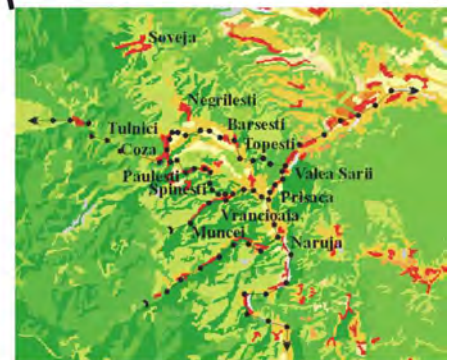
A complex information is thus obtained on the physical parameters causally linked to earthquake cumulating/triggering in the hypocenters of the Vrancea area, a veritable natural laboratory of geodynamics (Fig. 8), the seismicity of the zone being monitored by the seismological network that belongs to the National Institute for Earth Physics of the Ministry of Education and Research. The observation points in the framework of the micropolygons are included in the first order national networks (the national geodetic network and the magnetic and gravimetric fields observation networks).



Europa



România



Vrancea

Fig. 8. The location of the Vrancea Natural Laboratory for Geodynamics

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 Among these micropolygons, the most important one - the Micropolygon I Tulnici -
 is situated in the Vrancea geodynamically active area (Fig. 9) on both sides of the
 contact on which the hypocenters of the Vrancea seismogenic area are situated, till a
 depth that may exceptionally exceed 180 km.

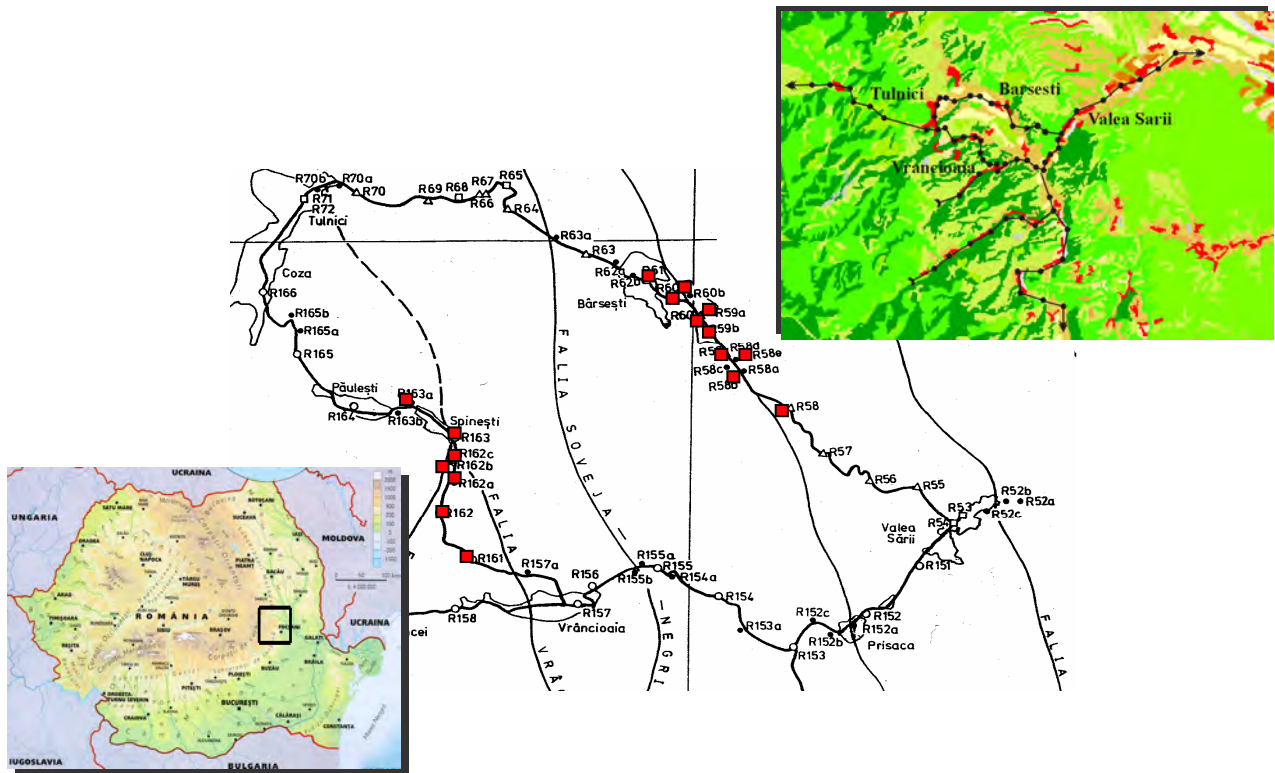


Fig. 9. The Micropolygon I – Tulnici

The Crăciunești-Deva, Sarmizegetusa-Regia, Padeș-Gorj Geodynamic Polygon
 is constituted, in its northern part, of a set of underground observatories including
 laboratories situated at depths exceeding sometimes 500 m below the soil surface,
 where the sensors are located far from any influences of anthropic activities and at a
 distance of about 300 km of the Vrancea geodynamically active area; these
 laboratories, which allow recordings that are subject only to low perturbation by
 parasite noises, have the role to provide a valuable reference information.

The Danube Delta - Constanta Polygon is dedicated to the monitoring of actual phenomena of sedimentation / erosion dynamics, specific to the river water / marine water / crust contact.

In the framework of the Institute, activities are performed by work groups directing their efforts to:

- the study of space-time evolution of the relative displacements between blocks which are in contact in the Vrancea geodynamically active area, with a special concern for the Tulnici-Greșu profile;
- the design of the methodology for an optimal emplacement of sensors able to highlight physical parameters causally linked to stress cumulating/ triggering in geodynamically active areas;
- the study of geomagnetic, gravity and geothermal fields space-time evolution; implications in Geodynamics;
- the study of possibilities to use information provided by the natural variations of the electromagnetic field, for a better knowledge of the tectonic blocks geometry, concerning especially certain geodynamically active areas;
- the study of the connections between volcanism and geodynamically active processes, with a special concern for connections with major tectonic sutures;
- the study of quantification criteria for ground motion severity; possibilities of elaborating a complex criterion which should take into account both instrumental and macroseismic criteria.

The research activity is coordinated by the Scientific Council of the Institute, which includes 4 members of the Romanian Academy. The Institute has a research potential constituted of 36 attested researchers, 18 teaching professors, 28 Ph.D.s, as a Graduate Studies Organizing Institute, it prepares Ph.D. students, also with double supervision in collaboration with specialists from other countries, and it organizes yearly specialty courses in geodynamics, instrumentation, information processing.

The ensemble of works which assure the functioning of the equipment installed in the geodynamics observatories, supplies measurements on geodynamic profiles and networks, provides the prompt repairing of the equipment and, especially, assures the building and experimenting of high performance sensors in Geodynamics, of own

construction or made worldwide, are carried out by a highly qualified research auxiliary personnel.

To maintain the level of the research at high level, specialists from other Romanian research units (The National Institute of Earth Physics, The National Institute for Building Research, the Geological Institute of Romania, the Geophysics Department of the Faculty of Geology and Geophysics, the Prospectiuni S.A. Enterprise, MINEXFOR Deva, etc.) are rallied to these activities, as well as specialists working in European research units with a similar profile (Institute de Physique du Globe - Paris, the Royal Observatory of Belgium, the Odendorf GeoObservatory of the Institute of Theoretical Geodesy of Bonn University, the Institute of Geophysics of the University of Karlsruhe, the Laboratory of Geophysics of Aarhus University, the United Institute of Earth Physics - Moscow, the Institute of Geophysics and Geology - Kishinev, the Institute of Geophysics - Bratislava, the Institute of Geodesy and Geophysics - Sopron, the Institute of Nuclear Research - Debrecen, a.s.o.), respectively from Japan (the Institute of Seismology and Volcanology of Hokkaido University) and the United States (the United States Geological Survey).

To strengthen the relations with the European centers of Geodynamics, respectively to make a direct contact to the achievements of these centers and to carry out, with equipment of own construction, connecting recordings, the Institute organized:

- in June-July 2000, an European Mission of Geodynamics in the framework of which a group of 12 Romanian researchers visited the Schiltach Observatory of the Institute of Geophysics - Karlsruhe, the European Institute of Geodynamics - Luxembourg, the Royal Observatory of Belgium, the Odendorf GeoObservatory of the Institute of Theoretical Geodesy of the Bonn University, Institut de Physique du Globe - Paris, institutions in the framework of which the partners, Romanian and foreign - at the international co-operation concerning the Vrancea area - presented the achieved results, and

- during 2001, the "Căldărușani 2001" International Symposium, which allowed to some of the European collaborators of the Institute to make a direct

contact to the works that are carried out in the framework of IG"SSS"AR and particularly in the framework of the Căldărușani Geodynamics Observatory and the Căldărușani-Tulnici Geodynamics Polygon, respectively.

Also during 2001, the "Sabba S. Ștefănescu" Institute of Geodynamics of the Romanian Academy founded in cooperation with the United Institute of Earth Physics "O.Yu.Schmidt" of the Russian Academy of Sciences, the *International Virtual Laboratory of Geodynamics*, an international laboratory open to the participation of researchers with preoccupations in this domain, from Romania and Russia, as well as from other countries. The International Virtual Laboratory of Geodynamics, supported by UNESCO - Paris, is currently becoming an international network of specialists activating in institutes interested in geodynamics. Up to this day, specialists from many other institutions have expressed their wish to join the Virtual International Laboratory of Geodynamics, from Romania (the Geodynamics Group in the Section for Oil, Mines and Geonomy of the Academy of Technical Sciences of Romania, The National Institute of Earth Physics, the Institute for Fine Mechanics, the National Institute for Building Research), from Germany (the Institute of Geophysics of the University of Karlsruhe), from the Republic of Moldova (the Institute of Geophysics and Geology of the Academy of Sciences in Chisinau) and from France (Institut de Physique du Globe - Paris, le Département de Géophysique Appliquée de l'Université Pierre et Marie Curie, Académie de Paris) - the sequence by which the Laboratory extension is to occur will be analyzed by the founders of the Laboratory in March-April 2002.

A mobile Geodynamics laboratory is being modernized, which has been used for complex geophysical measurements in geodynamically active areas also outside the country (electromagnetic soundings, electrometric measurements, soil vibration measurements, measurements of the electric, magnetic, and gravity fields), providing information about the vertical distribution of some of the physical parameters which characterize the various compartments of the Earth interior, from Earth surface to the depths that, for some of the parameters, may significantly exceed the thickness of the lithosphere.

The "Sabba S. Ștefănescu" Institute of Geodynamics of the Romanian Academy was distinguished in 2000, by the Romanian Academy and the National Agency for Science, Technology and Innovation with the Diploma and the title of *Institute of Excellency* and, within the framework of the analysis performed in 2001 on the results of the research activity in the research institutes of the Romanian Academy, IG"SSS"AR was also classified as an *Institute of Excellency*.

PUBLISHED PAPERS SELECTION

- M. Andreescu, The inverse approach to a geothermal profile of the Central Moesian Platform, Romania, *Tectonophysics*, 224, 435-442, 1993.
- M. Andreescu, C. Demetrescu, M. Ene, M. Diaconescu, V. Răileanu, M. Diaconescu, F. Rădulescu, A. Pompilian, D. Enescu, Complex geophysical study in the western part of the Moesian Platform and Carpathian Foredeep, *Rev. Roum Géophysique*, 38, 57-72, 1994.
- M. Andreescu, C. Demetrescu, A thermal and rheological model for the lithosphere in the convergence zone of the Eastern Carpathians, *Rev. Roum. Géophysique*, 43, 45-57, 1999.
- M. Andreescu, C. Demetrescu, Rheological implications of the thermal structure of the lithosphere in the convergence zone of the eastern Carpathians, *J. Geodynamics*, 31, 373-391, 2001.
- M. Andreescu, S.B.Nielsen, G.Polonic, C.Demetrescu, The heat flux budget of the Transylvanian lithosphere. Reasons for a low surface heat-flux anomaly in a Neogene intra-Carpathian basin, *Geophys. J. Int.*, accepted for publication, 2002.
- V. Chișcan, A. Damian, Observații privind evoluția geologică a șelfului românesc al Mării Negre și consecințe, *St. cerc. Geofiz.*, 34, 21-47, 1996.
- V. Chișcan, A. Damian, Aspecte ale evoluției geologice a sectorului Moesic Central Dobrogean acuatorial și consecințe, *St. cerc. Geofiz.* 35, 81-99, 1997.
- E. Cretu, C.Ioana, C.Suteanu, F.Munteanu, M.Rusu, Time series generator based on cellular automata, *Journal of Technical Physics*, 38, 2, 271-276, 1997.
- C. Demetrescu, S. Veliciu, D. Burst, Explanatory text-Romania, In: E. Hurtig, V. Cermak, R. Haennel, V. Zui (editors) *Geothermal Atlas of Europe*, VEB Hermann Haak, Gotha, 72-74, 1991.
- C. Demetrescu, S. Veliciu, Heat flow and lithosphere structure in Romania, In: V. Cermak, L. Rybach (editors), *Terrestrial Heat Flow and the Lithosphere Structure*, Springer-Verlag, Berlin, Heidelberg, New York, 187-205, 1991.
- C. Demetrescu, R.G. Dimitriu, C.S. Sava, M. Andreescu, Un câmp geomagnetic normal pentru sectorul românesc al platoului continental al Mării Negre, *St. cerc. Geofizică*, 30, 61-69, 1992.
- C. Demetrescu, M. Andreescu, Magnetic and electromagnetic induction effects in the annual means of geomagnetic elements, NASA Technical Memorandum on "Types and Characteristics of Data for Geomagnetic Field Modelling", NASA Conference Publication 3153, 333-340, 1992.

- C. Demetrescu, Variații regionale ale reologiei litosferei pe teritoriul României, *St. Cerc. Geofizică*, 31, 29-33, 1993.
- C. Demetrescu, M. Andreescu, G. Polonic, M. Ene, Câmpul crustal de temperaturi pe teritoriul României. Model de conducție staționară. *St. Cerc. Geofizică*, 31, 19-28, 1993.
- C. Demetrescu, George Atanasiu, Results of research on the secular variation of the geomagnetic field, *Rev. Roum. de Géophysique*, 38, 118-120, 1994.
- C. Demetrescu, M. Andreescu, Magnetic and electromagnetic induction effects in the annual means of the vertical component of the geomagnetic field at European Observatories, *Rev. Roum Géophysique*, 38, 73-84, 1994.
- C. Demetrescu, M. Andreescu, On the thermal regime of some tectonic units in a continental collision environment in Romania, *Tectonophysics*, 230, 265-276, 1994.
- C. Demetrescu, A. Soare, D. Enescu, Contribuții ale geofizicii generale la activitatea de prospecțiune din țara noastră, *St.cerc. Geofizică*, 33, 81-87, 1995.
- C. Demetrescu, G. Polonic, M. Andreescu, M. Ene, Thermal aspects of the geodynamic evolution of the Carpatho-Pannonian area, în: J.Sledzinski (Editor), *Monograph of Southern Carpathians, CERGOP Study Group 8 "Geotectonic Analysis of the Region of Central Europe"*, *Reports on Geodesy*, 7, 217-230, 1998.
- C. Demetrescu, H. Shimamura, Groundwater microtemperature measurements in Romania, In: G.Buntebarth (Ed.), *Microtemperature Signals of the Earth's Crust*, Clausthal-Zellerfeld Papierflieger, 142-147, 1999.
- C. Demetrescu, M. Andreescu, Thermal and rheological constants on tectonic models of convergence in the Eastern Carpathians, *St. cerc. Geofizică* 37, 1999.
- C. Demetrescu, S.B.Nielsen, M.Ene, D.Z.Șerban, G.Polonic, M.Andreescu, A.Pop, N.Balling, Lithosphere thermal structure and evolution of the Transylvanian Depression — Insights from new geothermal measurements and modelling results, *Physics of the earth and planetary Interiors*, 126, 249-267, 2001.
- C. Demetrescu, H. Wilhelm, M. Ene, M. Andreescu, G. Polonic, C. Baumann, V. Dobrică, D.Z. Șerban, On the geothermal regime of the foreland of the Eastern Carpathian bend, *J. Geodynamics*, 2002, submitted.
- C. Ioana, F.Munteanu, C.Suteanu, D.Zugravescu, Local and global anisotropy in two-dimensional structures: a new estimation method, *Romanian Geophysics*, 2, P20, 1995.
- F. Munteanu, C.Ioana, E.Cretu, C.Suteanu, D.Zugravescu, Algorithme pour la discrimination/classification des séries temporelles. Implications dans la géodynamique (in French, with an English abstract), *Revue Roumaine de Géophysique*, 38, 21-35, 1994.
- F. Munteanu, D.Zugravescu, C.Ioana, C.Suteanu, Sur la possibilité d'utiliser le scénario de Feigenbaum pour modéliser certains phénomènes géodynamiques (in French, with an English abstract), *Revue Roumaine de Géophysique*, 38, 3-9, 1994.
- F. Munteanu, D.Zugravescu, M.Rusu, C.Suteanu, On the synergy of ruptures, *Revue Roumaine de Géophysique*, 38, 11-20, 1994.
- F. Munteanu, C.Ioana, C.Suteanu, D.Zugravescu, Discriminating transient dynamics and critical states in active geodynamic areas, *Studii si Cercetari de Geofizica*, 33, 3-14, 1995.

- F. Munteanu, C.Ioana, C.Suteanu, E.Cretu, Smoothing dimensions for time series characterization, *Fractals*, 3, 2, 315-328, 1995.
- F. Munteanu, C.Suteanu, C.Ioana, D.Zugravescu, Fractal domains and dominant sizes in crack patterns, *Romanian Geophysics*, 2, C23, 1995.
- G. Polonic, Structure of the crystalline basement in Romania, *Rev. Roum. Geophys.* 40, 57-71, 1996.
- G. Polonic, Extensia – un proces geodinamic important în formarea Depresiunii Transilvaniei, *St. cerc. Geofiz.* 34, 47-61, 1996.
- G. Polonic, Malita, Z., Geodynamic processes and seismicity in Banat (Romania). *Rev de Géophysique, Rev Roum. de Géophys., Acad. Roum.* 41 (in press), 1997
- G.Polonic, F. Hauser, V.Răileanu, W.Fielitz, A. Bala, C. Prodehl, A.Schulze, VRANCEA 99 - the crustal structure beneath the southeastern Carpathians and the Moesian Platform from a seismic refraction profile in Romania, *Tectonophysics*, 340, 233-256, 2001.
- C. Suteanu, D.Zugravescu, F.Munteanu, Data evaluation by means of histogram flows (in Romanian, with an English abstract), *Studii si Cercetari de Geofizica*, 31, 51-62, 1993.
- C. Suteanu, C.Ioana, F.Munteanu, D.Zugravescu, Fractal aspects in solids fragmentation. Experiments and model with implications for geodynamics, *Revue Roumaine de Géophysique*, 37, 61-79, 1993.
- C. Suteanu, F.Munteanu, D.Zugravescu, Modeling of rock fragmentation emphasizing clustering on dominant size intervals (in Romanian, with an English abstract), *Studii si Cercetari de Geofizica*, 31, 63-79, 1993.
- C. Suteanu, La fragmentation - phénomène, instruments, sens (in French, with an English abstract), *Studii si Cercetari de Geofizica*, 32, 25-43, 1994.
- C. Suteanu, D.Zugravescu, C.Ioana, F.Munteanu, Correlation in size- and space distributions pertaining to fragmented structures, *Romanian Geophysics*, 2, C22, 1995.
- C. Suteanu, Data clustering detection for the evaluation of fragmentation phenomena, *Revue Roumaine de Géophysique*, 39, 13-24, 1995.
- C. Suteanu, F.Munteanu, D.Zugravescu, Hierarchies, scaling and anisotropy in dehydration cracking, *Revue Roumaine de Géophysique*, 39, 3-11, 1995.
- C. Suteanu, Inhomogeneous resolution analysis method for outcomes of fragmentation processes, *Studii si Cercetari de Geofizica*, 33, 15-29, 1995.
- C. Suteanu, D.Zugravescu, F.Munteanu, C.Ioana, Self-organization in geodynamic phenomena, *Revue Roumaine de Géophysique*, 40, 3-9, 1996.
- C. Suteanu, Structuring by fragmentation revealed by 3-dimensional evaluation, *Studii si Cercetari de Geofizica*, 34, 3-19, 1996.
- C. Suteanu, C.Ioana, E.Cretu, F.Munteanu, Complex dynamics and self-organized criticality, *Journal of Technical Physics*, 38, 2, 345-348, 1997.
- C. Suteanu, F.Munteanu, D.Zugravescu, Scaling regimes and anisotropy: towards an effective approach to complex geologic structures, *Revue Roumaine de Géophysique*, 41, 25-43, 1997.

- C.Suteanu, Ioana C., Munteanu F., Zugravescu D., Fragmentation laws and the collisional breakup of planetary bodies, *Revue Roumaine de Géophysique*, 42, 15-26, 1998.
- C. Suteanu, Events Thread analysis - a new approach to the investigation of seismogenic systems, *Studii si Cercetari de Geofizica*, 35, 21-33, 1998.
- C. Suteanu, D.Zugravescu, F.Munteanu, Critical slip displacement along an active geodynamic fault: dynamics on the interface (in Romanian, with an English abstract), *Studii si Cercetari de Geofizica*, 35, 1-12, 1999.
- C. Suteanu, Contrasting views of natural hazards: geodynamics and the public perception of extreme environmental variability, *Revue Roumaine de Géophysique*, 44, 2000.
- C. Suteanu, On the processes of meaning in geodynamics. Implications of a nonlinear approach, *Revue Roumaine de Géophysique*, 44, 2000.
- C. Suteanu, D.Zugravescu, F.Munteanu, Fractal approach of structuring by fragmentation, in T.Blenkinsop, J.H.Kruhl and M.Kupkova (eds.), *Fractal and Dynamic Systems in Geoscience*, Basel, Birkhaeuser, 539-557, 2000.
- C. Suteanu, D.Zugravescu, C.Ioana, Dynamic fingerprints of dissipative systems with discrete appearance: Applications in the study of seismicity, in J.H.Kruhl and H.-J.Krug (eds.), *Non-Equilibrium Processes and Dissipative Structures in Geoscience*, volume XI of "Yearbook for Complexity in Natural, Social and Human Sciences", Berlin, Duncker and Humblot, 209-228, 2001.
- C. Suteanu, D.Zugravescu, F.Munteanu, Fractured rock structures - evaluation of orientation dependent scaling properties, in D.Zugravescu, C.Suteanu (eds.), *Geodynamics - Outline of a Domain*, Publishing House of the Romanian Academy (in press), 2001.
- C. Suteanu, D.Zugravescu, F.Munteanu, The seismic activity in the Vrancea region in the light of the Events Thread analysis, *The Active Geodynamic Zone of Vrancea, Romania*, Bucharest, Publishing House of the Romanian Academy (in press), 2001.
- C. Suteanu, Contrasting views of natural hazards: Geodynamics and the public perception of extreme environmental variability, in D.Zugravescu, C.Suteanu (eds.), *The Active Geodynamic Zone of Vrancea, Romania*, Bucharest, Publishing House of the Romanian Academy (in press), 2001.
- C. Suteanu, J.H. Kruhl, Investigation of heterogeneous scaling intervals exemplified by sutured quartz grain boundaries (accepted for publication in *Fractals*) (to appear in 2002).
- D.Z. Şerban, Steady state and transient processes affecting the heat flow determinations with application to the Transylvanian Depression, *Rev. Roum. Geophys.*, 42, 75-91, 1998.
- D.Z. Şerban, B.H.Jacobsen, The use of broadband prior covariance for inverse paleoclimate estimation. *Geophys. J. Int.*, 147, 29-40, 2001.
- D.Z. Şerban, S.B. Nielsen, C. Demetrescu, Transylvanian heat flow in the presence of topography, paleoclimate and groundwater flow, *Tectonophysics*, 335, 331-344, 2001.
- D.Z. Şerban, S.B.Nielsen, C.Demetrescu, Long wavelength ground surface temperature history from continuous temperature logs in the Transylvanian Basin, *Global Planetary Change*, 29, 201-217, 2001.

- D. Zogrăvescu, G. Polonic, Geodynamic compartments and present-day stress on the Romanian territory, *Rev Roum. de Géophys., Acad. Roum.*, 41, 1997.
- D. Zogrăvescu, F.Munteanu, C.Suteanu, Geodynamics - an evolving concept (in Romanian, with an English abstract), *Studii si Cercetari de Geofizica*, 37, 1-12, 1997.
- D. Zogrăvescu, C.Suteanu, Géodynamique à l'échelle planétaire (Geodynamics at global scale) (in French); in D.Zogrăvescu, C.Suteanu (eds.), *Geodynamics - Outline of a Domain*, Bucharest, Publishing House of the Romanian Academy (in press), 2001.
- D. Zogrăvescu, M. Radulian, The Vrancea seismogenic zone - a natural geodynamics laboratory, in D.Zogrăvescu, C.Suteanu (eds.), *The active geodynamic zone of Vrancea, Romania*, Bucharest, Publishing House of the Romanian Academy (in press), 2001.