

## **Geoscience without Boundaries: in Memoriam of Professor Aleksander Guterch**

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On 28 December 2023, just before the start of the new, 2024 year, I received sad news by e-mail from my colleague Dr. Tomasz Janik that Prof. Aleksander Guterch had passed away at the age of 87. Compared to the colleagues from the Institute of Geophysics of the Polish Academy of Science, with whom Prof. Guterch was working side-by-side for many years, I have no reminiscences related to everyday routine research work with him. However, for me personally this news was particularly sad, as it is one of the events marking the end of an important and very intensive period of my scientific career. This period is related to participation in the EUROPROBE program, in which Prof. Aleksander Guterch was one of the key persons.

It is worth to remember now, in 2024, that the history of the EUROPROBE program started in the early 1980s. It was a time of great political and social progress in Europe, initiated not only by well-known “perestroika” processes in the Soviet Union, but by similar processes in many countries of Central and Eastern Europe. Without these political changes, it would not be possible to overcome the language and cultural barriers between scientists of Western, Central, and Eastern Europe that formed by that time. These barriers created numerous problems for successful scientific cooperation in many disciplines. Such a cooperation is particularly important for Earth Sciences, as geological units do not follow the state and political boundaries and tectonic processes forming our Earth are not dependent on the present state of relations between different countries and political blocks.

The first idea of cooperation between Earth Scientists of Western, Central, and Eastern Europe started to form in the 1980s, when the leading Earth Scientists from Western Europe and the Soviet Union started to discuss integrated geophysical and geological studies along some tentative east-west profile from the border zone between Asia and Europe to the Iberian Peninsula and the Atlantic margin (Gee and Stephenson 2006). The idea was presented at the International Geological Congress in Moscow in 1984, that is, one year earlier than the official start of “perestroika” in the Soviet Union in 1985. So, it could be said that the Earth Sciences researchers in Europe started the own “perestroika” earlier than politicians. This would not be possible without contribution from individuals with enhanced vision of the future of European science. Professor A. Guterch was one of the persons with such a vision.

The planning of scientific program of EUROPROBE started in 1988–1989, and the support of the European Science Foundation (ESF) helped organize the two planning workshops in Moscow (Russia) and Jabłonna (Poland) in 1991. In the last workshop, the first idea of the EUROPROBE/EUROBRIDGE project was presented by Prof. Svetlana Bogdanova from Sweden (Bogdanova 1993). She then became a scientific leader of the EUROBRIDGE/EUROPROBE project. Finally, the program consisting of 10 projects was approved by the ESF. The program was governed by an Executive Committee headed by Prof. David Gee, in which Prof. Aleksander Guterch represented Poland. He was also a coordinator of TESZ (Trans-European Suture Zone)/EUROPROBE project from Poland and a member of the EUROBRIDGE Seismic Working Group.

All these facts and pre-history were not known to me in 1994, then a PhD at the Institute of Geochemistry and Geophysics of the Academy of Science of Belarus. I was doing my PhD thesis in geophysics (then it corresponded to a Candidate of Science degree in the old USSR degree system) under the supervision of Prof. German Ivanovich Karataev, then the head of the Laboratory of Geophysics at that institute. Professor Karatayev, together with a famous geologists, Academician of the Academy of Science of Belarus, Radim Gavrilovich Garetsky, were the leading Belarussian scientists in the EUROBRIDGE/EUROPROBE multidisciplinary geological-geophysical project. The project aimed to study the region of the East European Craton between the Fennoscandian and Ukrainian shields covered by platform sediments. That is why a geophysical transect from southeastern Scandinavia, across Lithuania, Belarus, and Ukraine (all of them already independent countries then) was a backbone of the project. It was quite natural that the Laboratory of Geophysics and me personally were involved into the project. The key geophysical experiment was a seismic wide-angle reflection and refraction profile along the transect that was planned by a EUROBRIDGE Seismic Working Group composed of scientists from Poland, Germany, Denmark, Finland, Belarus, Ukraine, Lithuania, and Sweden. As the experience of seismologists from Belarus in deep seismic soundings was limited, international cooperation was particularly important for realization of the EUROBRIDGE'96 profile in Belarus.

The project was realized during 1994–2002 and became a very successful cooperation between West- and East European scientists despite numerous economic difficulties in new independent states of the former Soviet Union (Bogdanova et al. 2006). The support of INTAS organization (European Commission 2024) was particularly important for involvement of young scientists into the EUROBRIDGE and for their travels to EUROBRIDGE workshops organized in different countries involved in EUROPROBE.

After I started my work in EUROBRIDGE, Prof. Karatayev presented to me some papers by A. Guterch describing results of deep seismic sounding studies in Poland (c.f. Guterch 1970). This was for the first time I heard this name and started to familiarize myself with deep seismic sounding techniques, as previously I was dealing mainly with potential field studies and inverse geophysical problems. Later, during the EUROPROBE and EUROBRIDGE workshops organized during 1994–2002, I met Prof. Guterch in person many times. For me, it was quite clear then that he was one of the leading persons and drivers of the whole project. He was a person who could organize efficient work of research team composed of scientists with diverse cultural background and age. It was particularly interesting to observe this during the meetings of the EUROBRIDGE Seismic Working Group, where planning of EUROBRIDGE seismic profiles and data interpretation was done as a team work. During those hot discussions, I was particularly impressed seeing how Prof. Guterch communicated with young Polish colleagues, governing them extremely politely, without suppression of individuality. Together with other EUROBRIDGE senior scientists, Prof. Guterch created a very warm and friendly atmosphere at these workshops that did not exclude quite vivid discussions. I believe that working in the

EUROBRIDGE was an important experience not only for me, but for other junior researchers as well. The main skills learned then were the ability to see the European lithosphere at large scale, without limitations posed by political boundaries, and the ability to listen and respect diverse opinions. It is not a surprise that many young researchers that started their careers in the EUROBRIDGE became later not only recognized scientists in their countries, but also members of wider international scientific community.

Later, after I moved to the Department of Geophysics of the University of Oulu in Finland in 1996 and started to work with seismologist Jukka Yliniemi in the EUROPROBE/SVEKALAPKO project, I also understood the role of Prof. Guterch in the development of deep seismic soundings and lithosphere studies in Finland. Several Finnish deep seismic sounding profiles (SVEKA'81, FENNIA, and SVEKA'91) were realized via communication between Finnish seismologists (Prof. Urmas Luosto from the Institute of Seismology of the University of Helsinki, Jukka Yliniemi from the University of Oulu, and other colleagues) and the group of Polish seismologists from the Institute of Geophysics, Polish Academy of Sciences led by Prof. A. Guterch. These experiments were an important contribution to lithosphere studies in Finland. In particular, extremely deep (more than 60 km) Moho boundary beneath Central Finland (Luosto et al. 1984) was one of the motivations for SVEKALAPKO deep seismic tomography experiment in 1998–1999 (Hjelt et al. 2006) that was part of the EUROPROBE/SVEKALAPKO project.

Later, in the beginning of the 21st century, Prof. A. Guterch was one of initiators of a unique CELEBRATION 2000 (Central European Lithospheric Experiment Based on Refraction 2000) project that was a huge international cooperative effort that involved 28 institutions from Europe (including Finland) and North America (Guterch et al. 2003). The project collected high-quality deep seismic sounding data along profiles in Poland, Hungary, the Czech Republic, the Slovak Republic, Austria, Russia, Belarus, and Germany. My colleague Jukka Yliniemi from the University of Oulu was one of the members of the CELEBRATION 2000 EXPERIMENT TEAM (Guterch et al. 2003), so I was also extremely excited to observe this huge effort, and its results, although I was not involved directly into this project.

I would not write much about the role of Prof. Guterch in the projects devoted to lithosphere studies in Poland or in Polish Polar Research, as my colleagues from the Institute of Geophysics, Polish Academy of Sciences, can do it better than me. But I think that the CELEBRATION 2000 project, its data and results would be considered as a best monument in memoriam of Prof. Aleksander Guterch, one of the scientists who created the European geoscience without boundaries.

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