

In memoriam

Professor Stefan Boyanov Shanov, DSc (November 11, 1948 – May 23, 2023)

Stefan Boyanov Shanov, DSc, a professor in seismotectonics at the Geological Institute of the Bulgarian Academy of Sciences, passed away in May 2023 at the age of 75. He was focused for many years on seismotectonic and paleoseismological investigations and seismic hazard, the study of recent geodynamic processes in the Earth's crust and the deep structure of the lithosphere, according to structural and geophysical data, the study of caves and the tectonics of karst systems. His colleagues from the Geological Institute deeply regret the loss of a respected scientist, who dedicated his entire career to the field of geology and geophysics.

Professor Stefan Shanov was born on November 11, 1948, in Gabrovo. He completed his secondary education in 1967 at the Ninth French Language High School – Sofia, after which he was admitted to the Higher Institute of Mining and Geology (today University of Mining and Geology “St. Ivan Rilski”), from where he graduated in 1972 in Geophysical Methods of Investigation. Soon after graduation, Stefan Shanov began working as an engineer-geophysicist at the Research Institute “Energoproect” of the State Directorate for Engineering-Geological and Hydrogeological Surveys, where he worked for six years. From 1978 to 1981, he was a PhD student at the Department of Dynamic Geology, Faculty of Geology of Moscow University, where he successfully defended his thesis “Seismotectonic conditions for earthquake occurrence on the territory of Bulgaria.” In 1982, Stefan Shanov became an Assistant Professor at the Geological Institute, where he continued working



until his retirement in 2011, passing through the positions of Associate Professor (1992–2001) and Full Professor (2001–2011). In 1997, he defended his DSc thesis entitled “Contemporary and Neotectonic stress fields in the Eastern Balkan Peninsula”. Of note are his specializations in Earthquake Prediction at the Center of Theoretical Physics, Trieste, Italy (1988), as well as in Geostatistics at the Center for Geostatistics of the Paris School of Mines (Centre de Géostatistique, École nationale supérieure des mines de Paris), Fontainebleau, France (1992). It is also worth mentioning that he was Director of the Regional Investigations Division at the Geology & Geophysics Co. (Sofia). Prof. Shanov was a patient and dedicated mentor

and scientific supervisor of both graduate and PhD students. He taught a special course *Basics of linear geostatistics and its application for natural sciences* held in the Education Center at the Bulgarian Academy of Sciences. He also gave lectures on Seismotectonics at the University of Mining and Geology.

During his research career, Prof. Shanov penned more than 200 publications. Especially significant are his contributions to the tectonic plate motions, stress fields and geodynamics of different Bulgarian areas, *e.g.*, Lom Depression, Sofia Graben and Black Sea shelf, but also in the Central Betic Cordillera (Spain). Along with that, he contributed to the knowledge on the structure of the Earth's crust in the Eastern Rhodopes. His works on the Gorna Oryahovitsa and Kresna active seismogenic zones, but also on the Maritsa seismic region, are valuable as well. The co-authored paleoseismological investigations of the fault ruptures associated with the strongest earthquakes that occurred in Bulgaria, those near Krupnik and Chirpan, were also among the achievements of Prof. Shanov. His research also focused on recent geodynamics in karst terrains, including reconstructions of tectonic stress fields via structural analysis, studies of rock anisotropy, and fault-plane solutions resulting from earthquakes. In addition, this work included studying spatial orientation and absolute dating of deformed speleothems, measurements by mechanical and instrumental means, monitoring and modeling, based on case studies from karst regions from Albania, Bulgaria, Cuba and France.

Professor Shanov actively collaborated with many scientists from Europe and participated in a variety of national and international projects, *e.g.*, NATO Project "Seismic Hazard of the Circum-Pannonian Region" (1996–1999); COPERNICUS Project "Assessment of the Seismic Potential of European Large Earthquakes Areas" (1997–2000); "Moment deformations in young sediments – geological indicators for paleoseismic events" executed within the bilateral cooperation between the Geological Institute and the Royal Observatory of Belgium (2000–2005); "Paleoseismological investigations in Bulgaria: Chirpan-Popovitsa region", supported by the National Science Council of the Bulgarian Ministry of Education and Science (2003–2005); Project R-4 "Intramoesian Fault: Geophysical considerations for its structure and recent seismic activity", a joint research project between the Ge-

ological Institute and the Faculty of Geology and Geophysics of the University of Bucharest, Romania (2005–2007). Professor Shanov applied methods of geostatistics in evaluation of the resources of polymetallic concretions in the Pacific Ocean in the frames of a Contract with the Joint Organization "INTEROCEANMETAL" (headquarters in Szczecin, Poland), where the Republic of Bulgaria is a member. He participated in many scientific symposia, congresses and conferences, both in Bulgaria and abroad (Austria, Belgium, Brazil, India, Germany, Greece, Italy, France, Poland, Romania, Serbia, Luxemburg, former USSR, Turkey, Montenegro, and UK). Stefan Shanov was a member of the Bulgarian Geological Society; Bulgarian and Balkan Geophysical societies (Vice President (1996–2005) and President (2005–2016) of the Bulgarian Geophysical Society); the Union of Scientists in Bulgaria; the Society of Exploration Geophysicists (SEG); the European Association of Geoscientists and Engineers (EAGE). He headed the Laboratory of Seismotectonics (2001–2011), but was also a Scientific Secretary (1994–2000) and a member of the Scientific Council of the Geological Institute. His interest in caves began very early in his life, and he studied them both in Bulgaria and abroad throughout his life. Stefan Shanov was the chief leader of the Bulgarian speleological expedition PYRENEES-France'87, as well as leader of the BARKI-14 expedition in the Vratsa Mt. (NW Bulgaria). He was a research supervisor of the Cuban-Bulgarian expedition GUASO'88, during which complex speleological studies were conducted on the Guaso Plateau (Guantanamo Province). He was also a member of the Bulgarian cave expedition ALBANIA'93. Stefan Shanov has original geophysical studies of the Svirchovitsa-Bankovitsa karst system near Karlukovo (West Fore-Balkan Mts). Among the leading cavers of the Cave Club Akademik (President, 1993–1997), he often gave popular lectures about various aspects of the Bulgarian karst. He was also actively involved in conducting courses in speleology and cave rescue.

Our colleague and friend Professor Stefan Shanov is gone. He was a scientist who earned the respect of all who knew him. The fellow workers of the Geological Institute extend their deepest condolences to his family. Stefan is survived by his wife, son and grandson, as well as numerous geologists, geophysicists and speleologists who will all miss him.

Lubomir Metodiev, Marlena Yaneva

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STEFAN SHANOV**

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