

Nedjeljko Frančula (1937-2026)

In memoriam

Nedjeljko Frančula was born in Zagreb on June 20, 1937. He passed away in Zagreb on September 13, 2026. He graduated in 1962 from the Geodetic Department of the Faculty of Architecture, Civil Engineering and Geodesy in Zagreb, and received his doctorate in 1971 in Bonn (Landwirtschaftliche Fakultät) with the thesis *Die vorteilhaftesten Abbildungen in der Atlaskartographie*. He spent two years (1969–71) at the Institute of Cartography and Topography at the University of Bonn as a scholarship holder of the German Academic Exchange Service (DAAD) and returned there in 1976 – again on a DAAD scholarship – for a three-month period of advanced professional training in the field of cartographic automation. He was appointed assistant at the Faculty of Geodesy, University of Zagreb, in 1963, assistant professor in 1975, associate professor in 1980, and full professor in 1985. In 1996, he was appointed to the permanent academic rank of full professor in the field of technical sciences (geodesy). In 2007, the Senate of the University of Zagreb appointed him professor emeritus.

He served as Head of the Institute of Cartography at the Faculty of Geodesy, University of Zagreb, from 1981–83, 1987–91, and 1997–99; Acting Head of the Institute of Photogrammetry from 1999–2000; Head of Postgraduate Studies from 1985–89; Vice-Dean for Research and Professional Work from 1976–81; and Vice-Dean for Academic Affairs from 1999–2003.

At the Faculty of Geodesy, he taught the courses *Geoinformatics I*, *Cartography II*, *Cartography III*, and *Computer Processing of Geodetic Data*. In addition to teaching in Zagreb, he also taught undergraduate and postgraduate courses at the Faculty of Architecture, Civil Engineering and Geodesy in Ljubljana from 1974 to 1976. Under the 1994 curriculum, he taught *Geoinformatics I*, *Map Projections*, *Digital Cartography*, and *Cartographic Generalization* at the Faculty of Geodesy. Starting in the 2002/03 academic year, he taught *Map Projections* and *Digital Cartography*. At the postgraduate level, he taught *Introduction to Scientific Research* and *The Official Topographic-Cartographic Information System of the Republic of Croatia*. He supervised 65 diploma theses, eight master's theses, and four doctoral dissertations. Having spent over thirty years applying computers to solve geodetic and cartographic problems, he introduced digital cartography into the undergraduate and postgraduate curricula at the Faculty of Geodesy in Zagreb.

He led the scientific task *Cartographic Research of Space* (1987–91) and the scientific projects *Cartography and Geoinformation Systems* (1991–96) and *Croatian Cartography – Scientific Foundations* (1997–2001), as well as the scientific-professional projects *Croatian Cartographers* (1996–2002) and *Geodetic Dictionary* (1996–2003).

He has published a total of 871 scientific and professional papers or reviews. Since retiring – over the last twenty years – he has published 465 papers. Everything is duly recorded in the Croatian scientific bibliography, CroRIS. Several additional articles have been accepted for publication. Working predominantly in teams, he carried out 38 professional-practical projects (geodetic surveys, topographic and thematic maps), produced ten expert reports, and developed 25 computer programs.

His primary research areas are map projections and digital cartography. The results of his research on map projections with minimal distortion have been cited in CC-indexed journals, foreign textbooks, reference works, and encyclopaedias.

From 1976 to 1986, he served as deputy editor-in-chief of the journal *Geodetski list*, and from 1987 to 1995, as its editor-in-chief. In early 1997, he was elected head of the *Cartography Section of the Croatian Geodetic Society*. Since 1998, he has been a full member of the *Croatian Academy of Engineering*, within the Department of Civil Engineering and Geodesy.

He was awarded the *Power of Knowledge* Lifetime Achievement Award by the Croatian Academy of Engineering in 2004. He became an honorary member of the Croatian Cartographic Society in 2007.

He has been retired since October 1, 2006, yet his active engagement in scientific and professional work has not ceased. The published scientific papers of N. Frančula can be classified into the following groups:

- The mathematical basis of small-scale maps
- Gauss-Krüger and other geodetic projections
- Digital cartography (cartographic generalization, cartometry)
- The future of geodesy and cartography.

The most important work of N. Frančula in the group of *the mathematical basis of small-scale maps* is his doctoral dissertation. Based on the conducted research and comparison of projections for world maps, he came to important conclusions about the properties of the most favourable projections for world maps. The published results also caused reactions from a certain number of scientists. The polemic that was conducted in the magazine *Kartographische Nachrichten* showed that N. Frančula sovereignly rules this field.

Many of N. Frančula's publications fall within the category of Gauss-Krüger and other geodetic projections. In a 1969 monograph, B. Borčić and N. Frančula analysed the old coordinate systems used in Croatia and provided solutions for transforming coordinates from those systems into Gauss-Krüger projection systems – solutions that found widespread practical application.

N. Frančula is a pioneer in the introduction of *digital methods in geodesy and cartography* in the former Yugoslavia, as well as globally in the field of map projections. Automating generalization represents one of the greatest challenges in the process of introducing automation to map production. For a number of years, N. Frančula and his associates conducted research into the automated generalization of linear cartographic elements. The application of digital methods in cartometry has significantly advanced cartometric work. In several studies, N. Frančula and his associates were the first (in 1992) to determine the area of Croatia's coastal waters and the sea area situated between the state border and the outer limit of the continental shelf. These studies demonstrated that the areas of territorial units could be determined with high precision using digitized boundary coordinates – derived not only from large-scale topographic maps but also from a 1:1,000,000 scale map. These works served as a model for all subsequent researchers in Croatia addressing this subject.

In recent years, N. Frančula has focused extensively on the *future of geodesy and cartography*. In several papers and public lectures, he demonstrated that the changes occurring in these fields over the past fifty years can – without exaggeration – be described as revolutionary. These changes are linked to advancements in electronic, satellite, and computer technologies. They are so significant and far-reaching that they have prompted changes in the names of geodetic associations, journals, educational institutions, and even the profession itself. Consequently, he advocated for the introduction of a geoinformatics specialization alongside the traditional geodetic track during curriculum reform.

In 1977, together with professors B. Borčić, I. Kreiziger and P. Lovrić, he compiled the first multilingual cartographic dictionary with definitions and explanations in the Croatian language. Together with M. Lapaine, he created the *Geodetic-Geoinformatics Dictionary* in 2008, and with M. Lapaine and I.-P. Jazbec *Cartographic Dictionary* 2020. From 2022, he published together with M. Lapaine in *Cartography and Geoinformation* in three instalments of contributions entitled *New Cartographic Names*, and from 2024 ten contributions entitled *New Geodetic-Geoinformatics Names* in *Geodetski list*. He made a valuable contribution to the articles on geodesy and cartography that were published in 2026 in the 3rd volume of the *Croatian Technical Encyclopaedia*. Constantly following world events in the field of cartography, he published a large number of reviews of books, journals, new maps, atlases, software and hardware. In recent years, he has been particularly attracted by the emergence of artificial intelligence, especially in geodesy and cartography. He published a large number of views on this topic.

Professor Emeritus Nedjeljko Frančula left an indelible mark on Croatian geodesy and cartography. We will remember him as an outstanding expert and professor, but also as a man who radiated kindness, never raised his voice, and was always ready to help.

Prepared by M. Lapaine