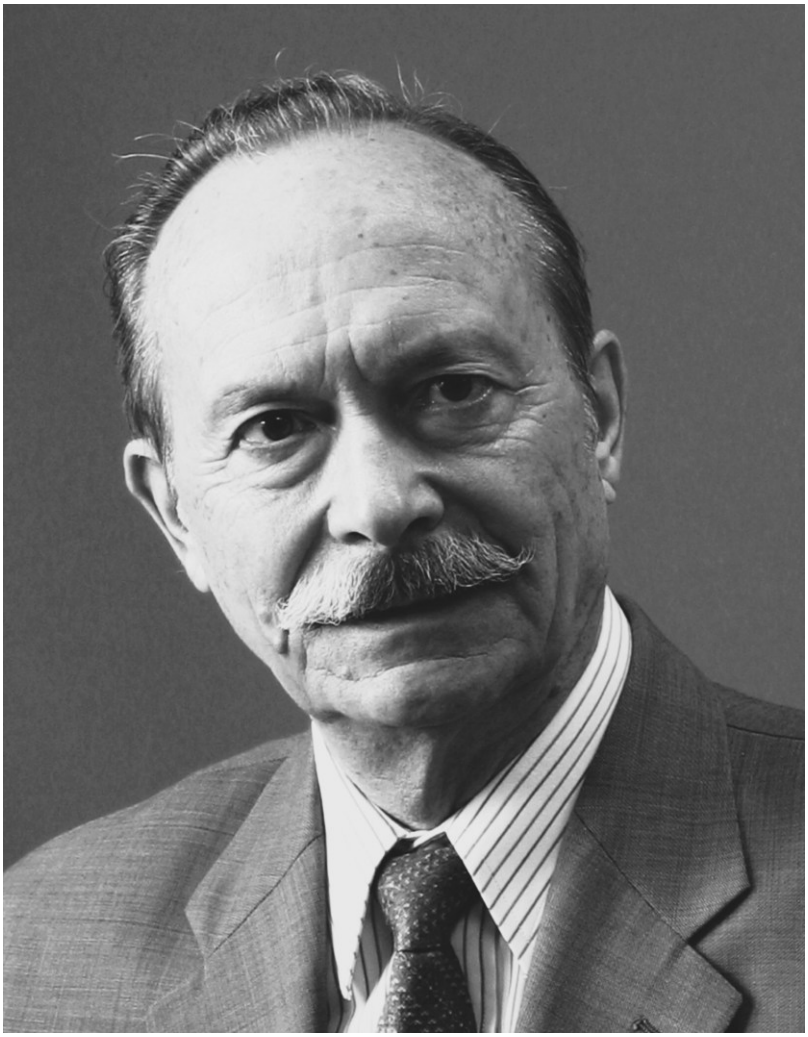
In Memoriam – Professor Joe (József) Tóth (1933–2026)



Deep sadness has been felt throughout the international hydrogeological community following the passing of Professor Joe Tóth, founder of the theory of regional groundwater flow systems, Professor Emeritus of the University of Alberta, Honorary Professor of Eötvös Loránd University, and external member of the Hungarian Academy of Sciences. He passed away on 3 July 2026 in Edmonton, Canada, in the 94th year of his life.

His pioneering scientific work fundamentally transformed modern hydrogeology and established the conceptual foundations for understanding groundwater flow systems at regional scales. His achievements were recognized through numerous international awards, including the O. E. Meinzer Award, the IAH President's Award, the Robert N. Farvolden Award, the M. King Hubbert Science Award, and the C. V. Theis Award.

Throughout his life, Professor Tóth remained deeply committed to the international hydrogeological community and to supporting future generations of researchers. His scientific legacy continues through his publications, students, and the institutions and initiatives inspired by his work.

Farewell to Professor Joe Tóth, Founder of the Theory of Regional Groundwater Flow Systems

It is with deep sorrow that we announce the passing of Professor Joe Tóth, hydrogeologist, founder of the theory of regional groundwater flow systems. He was a former professor at the University of Alberta, honorary professor of Eötvös Loránd University, and external member of the Hungarian Academy of Sciences. He passed away in Edmonton on July 3, 2026, in the 94th year of his life.

Professor Tóth was born in Békés, Hungary, on June 22, 1933. He began his studies at the University of Sopron and, following the Hungarian Revolution of 1956, completed them at Utrecht University in the Netherlands, where he earned his doctoral degree in 1965. He spent the defining years of his scientific career in Canada, first as a researcher at the Alberta Research Council and later as a professor at the University of Alberta. He also contributed to hydrogeological education at the University of Calgary as Visiting Professor in Hydrogeology, introducing his petroleum hydrogeological approach to new generations of students.

His scientific achievements fundamentally shaped modern hydrogeology worldwide. Today, the theory of regional groundwater flow systems is regarded as one of the cornerstones of hydrogeological thinking, providing a fundamental conceptual framework for generations of researchers, educators, and practicing professionals.

Among his more than one hundred internationally recognized publications founded on his theory, a number of studies addressed specialized internationally acknowledged topics such as groundwater-surface water interaction and related wetlands, impacts on vegetation, soil-mechanical phenomena, formation and remediation of saline soils, geothermal patterns, the subsurface disposal of high-level radioactive waste, and hydrocarbon and uranium exploration. Even today, sixty-four years after its inception, his theory continues to inspire increasing international interest and ongoing scientific advancement.

His contributions were recognized with virtually every major international distinction in hydrogeology. Among these was the O. E. Meinzer Award, which was awarded to him as the first recipient by the Hydrogeology Division of the Geological Society of America. In 1999, he received the President's Award of the International Association of Hydrogeologists. In 2002, he was honored with the Robert N. Farvolden Award presented by the Canadian Geotechnical Society and the Canadian National Chapter of the International Association of Hydrogeologists; in 2003, he received the M. King Hubbert Science Award from the National Ground Water Association; and in 2004, the C. V. Theis Award from the American Institute of Hydrology. In 2012, the International Association of Hydrogeologists elected him an Honorary Member.

In 2013, the Hungarian state recognized his lifetime achievements with the Commander's Cross of the Hungarian Order of Merit, Civil Division. In 2016, he was elected an external member of the Hungarian Academy of Sciences.

Deeply devoted to the global hydrogeological community, Professor Tóth remained throughout his life an active and highly respected contributor to the work of the International Association of Hydrogeologists. He served as Vice-President of the International Association of Hydrogeologists, founded the Canadian National Chapter of the International Association of Hydrogeologists (IAH-CNC), and served as its President. He also actively contributed to the establishment of the IAH Hungarian National Chapter and founded the IAH Regional Groundwater Flow Commission (RGFC).

The Regional Groundwater Flow Commission became one of the lasting international institutional expressions of his scientific vision. Established to promote the research, education, and practical application of regional groundwater flow systems, the Commission carries forward the conceptual approach that Professor Tóth introduced to hydrogeology: the understanding of groundwater beyond individual aquifers, as part of basin-scale, dynamic, and geologically active systems. As Lifetime Honorary Chair of the RGFC–IAH, he remained a guiding intellectual presence for an international community of researchers dedicated to developing and applying the Tóthian concept worldwide.

Although he spent much of his life in Canada, Professor Tóth maintained his Hungarian identity throughout his career, preserved his eloquent command of the Hungarian language, and remained closely connected with Hungarian hydrogeologists and with the hydrogeological research community of Eötvös Loránd University.

This bond with his homeland also took institutional form through his generous role as a patron of Hungarian hydrogeology. By establishing the foundation bearing his and his wife Erzsébet's name in his native Hungary, Professor Tóth created a lasting framework for supporting hydrogeological research at Eötvös Loránd University, fostering doctoral and postdoctoral talent, and strengthening the international engagement of young researchers.

Through this act of patronage, he ensured that the scientific vision he had developed over a lifetime would continue to inspire and support future scholars in Hungary as well.

His work is carried forward by the József and Erzsébet Tóth Hydrogeology Research Group, inspired by his intellectual heritage, and by the József and Erzsébet Tóth Hydrogeology Chair Foundation, which supports its activities. Several years ago, Professor Tóth also entrusted Eötvös Loránd University with the preservation and research accessibility of the material legacy connected to his scientific career.

> *Throughout his life, Professor Tóth returned to one deceptively simple question: what happens to a raindrop from the moment it reaches the Earth? In seeking to answer this question, he transformed the understanding of groundwater movement and pioneered a new school of thought in hydrogeology. For him, the path of a single drop of water opened the way to understanding groundwater as part of regional, dynamic, and geologically active systems. He once said: "I'm interested in nature's secrets, how nature is put together." This lifelong curiosity, combined with intellectual rigor, generosity, and an exceptional commitment to his students and colleagues, made him not only one of the founding figures of modern hydrogeology, but also a true builder of scientific communities.*

The international hydrogeological research community will preserve Professor József Tóth's memory with gratitude and respect and will continue the work he entrusted to us. This farewell is shared by his colleagues, former students, and friends, including the communities of the University of Alberta and Eötvös Loránd University, and by the international members of the Regional Groundwater Flow Commission and the Canadian and Hungarian National Chapters of the International Association of Hydrogeologists. Across continents, institutions, and generations, his understanding of groundwater as a regional, dynamic, and geologic agent continues to connect us.

Farewell, Professor Tóth. Farewell, dear Joe. Your journey continues in the waters, landscapes, ideas, and people you helped us understand.