



REMEMBERING PROFESSOR JÓZSEF (JOE) TÓTH

1933–2026

A commemorative collection from the IAHR 2026 World Groundwater Congress

Budapest, 15 September 2026



Messages • Keynote lectures • Personal tributes



A presence felt throughout IAH 2026

At the **53rd IAH World Groundwater Congress in Budapest**, Professor József (Joe) Tóth's presence was felt throughout the opening day. Although he sadly passed away on **3 July 2026**, only a few months before the Congress, his scientific ideas, personal influence and connection to the international hydrogeological community became an important thread linking the **Opening Ceremony**, the **first keynote lectures** and a **dedicated commemorative session**.

This collection brings together some of these moments through **video recordings, photographs and personal reflections**, preserving the many ways in which colleagues, former students and friends remembered Joe during IAH 2026.

1. A final message to the international groundwater community

One of the most moving moments of the **Opening Ceremony of IAH 2026** was dedicated to **Professor József (Joe) Tóth**. The tribute was introduced by **Judit Mádl-Szőnyi, Chair of the Scientific Committee** of the Congress and **Chair of the IAH Regional Groundwater Flow Commission**, who had been mentored by Professor Tóth and later worked closely with him for many years.

In her remembrance, Judit described Joe Tóth as **one of the most influential hydrogeologists of the twentieth century**. His concept of **regional groundwater flow systems** fundamentally changed the way groundwater is understood: rather than viewing groundwater only locally, his work revealed the organised, basin-scale systems through which water moves beneath the landscape. This conceptual breakthrough profoundly influenced modern hydrogeology and continues to shape **research, education and water management** around the world.

Yet his legacy was never confined to scientific theory. Although Professor Tóth spent most of his distinguished career in Canada and worked as a respected expert around the world, he **always remained proud of his Hungarian roots**. For **more than three decades**, he continuously supported hydrogeology in Hungary, helped build a **strong Hungarian school of hydrogeology**, and played a pivotal role in connecting Hungarian hydrogeologists with the **international IAH community**. He taught us that scientific excellence grows through **openness, cooperation and international partnership**.

He inspired the creation of the **Hungarian National Chapter of the IAH** and later the **IAH Regional Groundwater Flow Commission**. As Judit emphasised during the Opening Ceremony, **many of those present owed part of their professional journey to his guidance and encouragement**.

When preparations for the Budapest Congress began, the organisers deeply hoped that Professor Tóth would be able to be part of this historic gathering. In the previous year, he had kindly recorded a special greeting for the participants of **IAH 2026**. He passed away on 3 July 2026, before he could see the international groundwater community gather in Budapest. The recording therefore acquired an entirely new significance. What had originally been intended as a welcome message became a final opportunity for colleagues, students and friends around the world to hear **his voice, his wisdom and his vision** once more.

The message was shown to the Congress during the Opening Ceremony. At its conclusion, Judit invited the audience to **stand together in tribute to Professor Tóth**, creating a quiet and deeply personal moment of remembrance shared by the international hydrogeological community.

The moment was particularly symbolic for the Hungarian hydrogeological community. As was recalled during the ceremony, Professor Tóth had been present **twenty years earlier** when the **Hungarian National Chapter of the IAH** was founded. In 2026, his recorded message opened a **World Groundwater Congress in his native country**—bringing together the international community that he had helped connect throughout his career.



VIDEO | Watch Professor József Tóth's message to IAH 2026

2. His scientific legacy in the first keynote lectures

Immediately after the Opening Ceremony, the scientific programme began with **two keynote lectures** explicitly framed as a **tribute to Professor Tóth's scientific legacy**. Judit Mádl-Szőnyi introduced the speakers by emphasising that the two talks approached groundwater flow-system science from **complementary directions**: one followed the **international development of the theory** itself, while the other showed how flow-system concepts became increasingly powerful through **numerical modelling**.

Together, the lectures created a deliberate **bridge between scientific history and present-day hydrogeology**. They showed how an idea that began with a new way of understanding regional groundwater movement has continued to evolve into a **practical framework** for analysing complex subsurface systems and addressing **contemporary groundwater challenges**.



Judit Mádl-Szőnyi introducing the two keynote lectures dedicated to honouring the scientific legacy of Professor József Tóth.

Xiao-Wei Jiang

The international development of theoretical groundwater flow system studies

Professor Xiao-Wei Jiang of China University of Geosciences (Beijing), co-chair of the **IAH Regional Groundwater Flow Commission**, approached Tóth's legacy through the international development of theoretical groundwater flow-system research. Jiang's own work examines the **physics and chemistry of groundwater flow systems** and their behaviour in major sedimentary basins, including the **Ordos Basin** and the **North China Plain**. This background allowed him to place Tóth's conceptual breakthrough within a broader international trajectory of groundwater research.

The keynote highlighted how flow-system thinking moved beyond its original setting to become an internationally recognised framework for interpreting **regional groundwater dynamics**. In this sense, the lecture was not only historical: it demonstrated that the theoretical questions opened by **Tóth** continue to generate new research and remain relevant to the way hydrogeologists understand **basin-scale groundwater systems** today.



[VIDEO](#) | [Watch Xiao-Wei Jiang's keynote](#)

John Molson

Groundwater flow system modelling: A historical and practical perspective

Professor John Molson of Université Laval, Canada, complemented the theoretical perspective with a historical and practical account of groundwater flow-system modelling. His research spans numerical simulation of **groundwater flow and coupled processes**, including reactive contaminant transport, heat transport, density-dependent flow and basin-scale hydrogeological characterisation, with applications to **groundwater protection and remediation**.

Molson's lecture showed how **conceptual understanding of regional flow systems** can be translated into **quantitative models** that test hypotheses, integrate complex subsurface processes and support real-world hydrogeological decisions. Seen alongside Jiang's keynote, the presentation illustrated the **continuing journey of Tóth's legacy**: from a powerful conceptual framework for seeing groundwater systems to increasingly sophisticated tools for analysing how those systems function.



[VIDEO](#) | [Watch John Molson's keynote](#)

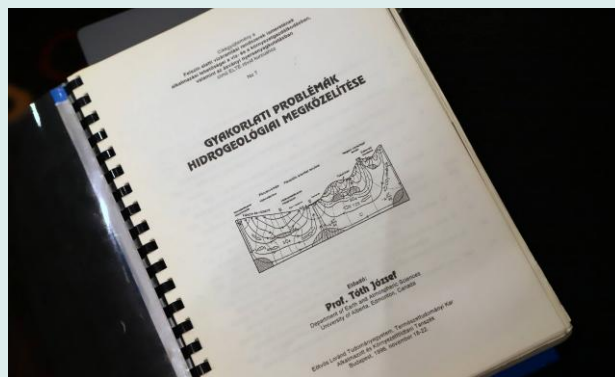
3. Special Session for József Tóth

Later during the Congress, colleagues, former students and friends gathered for the **Special Session for József Tóth**, chaired by **Judit Mádl-Szőnyi** and **Brigitta Czauner**. **Ten short contributions** combined scientific reflection with personal memories, showing how Joe's ideas and character influenced hydrogeologists across generations and continents.

The format reflected the breadth of his legacy. Some speakers traced the influence of **regional groundwater flow theory** through research communities, institutions and applied hydrogeology; others returned to field excursions, shared conferences, mentorship and friendship. Together, the presentations showed that Joe's impact travelled not only through papers and concepts, but through **teaching, conversation and the personal encounters** that shaped the careers of those around him.



Session chairs Brigitta Czauner and Judit Mádl-Szőnyi opening the Special Session for József Tóth.



An ELTE hydrogeology course note used by Professor Tóth in teaching during the 1990s, presented by Teodóra Szócs during her tribute.

What followed was a mosaic of scientific influence and personal memory. The speakers remembered Joe as a **scientist, mentor, colleague, field teacher and friend**, and their stories revealed how widely his ideas travelled while remaining closely connected to individual lives and careers. The **ten tributes** below are presented in the order of the commemorative session.

Personal tributes



Judit Mádl-Szőnyi

Before me stood the living genius of hydrogeology, Joe Tóth – A personal reflection

Judit Mádl-Szőnyi's tribute began with her first meeting with Professor Tóth in 1994, a defining moment in her scientific career and in the way she understood groundwater. Joe introduced her to systems thinking and taught her how to read the landscape in the field: to look beyond individual observations and recognize the interconnected groundwater flow systems and processes beneath them. She immediately knew that this was what she wanted to understand, and it became the focus of her scientific journey.

Judit remembered not only the scientist, but also the mentor whose rigour was matched by trust and encouragement. His influence shaped her own work and helped strengthen modern hydrogeology at Eötvös Loránd University, where his intellectual legacy continues through the József and Erzsébet Tóth Endowed Hydrogeology Chair.

For Judit, one of the most beautiful parts of Joe's legacy is that what he gave to her, she could pass on to future generations. Joe also opened the international world of hydrogeology to her, while the flow-system approach found a formal home within the IAH through the Regional Groundwater Flow Commission.

Joe often said that groundwater would become one of the key resources of the twenty-first century. In light of today's water and climate challenges, Judit reflected: "How right he was." Remembering the scientist, mentor and friend, she closed by addressing him directly: "*Your ideas continue to guide us, and perhaps there has never been a time when your systems thinking has been more needed than today.*"



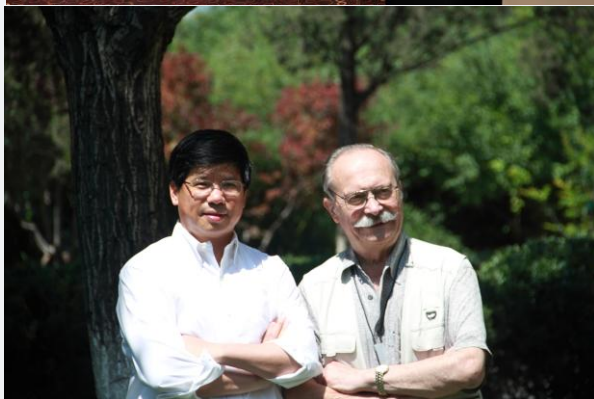


Hanneke Verweij

Prof. Joe Tóth's inspiring role in the development of research into groundwater systems on geological timescales in the Netherlands since the late 1980s

Hanneke Verweij traced Professor Tóth's influence through almost four decades of research in the Netherlands. His hydraulic theory of petroleum migration first drew her attention to the interaction between large-scale groundwater flow systems and petroleum systems. In 1986, this inspiration led her to begin research on fluid-flow systems in developing sedimentary basins on geological timescales — an approach that was still far from routine at the time.

From there, the analysis of regional pressure and groundwater-flow systems became part of a wide range of research and joint industry projects in the Netherlands and beyond, with applications to the assessment of natural resources. Verweij highlighted one of the enduring strengths of Tóth's concept of groundwater as a geologic agent: it encourages hydrogeologists to integrate information across disciplines rather than treat subsurface processes in isolation. Her memories were also deeply personal. She recalled his stimulating discussions and warm interest in colleagues over many years, including his participation in her PhD committee in Amsterdam in 2003.



Chunmiao Zheng

How József Tóth's theory of regional groundwater flow systems helped launch my career

For Chunmiao Zheng, Joe Tóth's influence began before the two met personally. As a PhD student at the University of Wisconsin–Madison in the late 1980s, Zheng encountered Tóth's landmark 1962 and 1963 papers on regional groundwater flow systems in a course taught by his advisor, Professor Mary Anderson. The ideas immediately provided a new framework for understanding how groundwater behaves at the scale of entire basins rather than as a collection of isolated local problems.

That systems perspective became foundational to Zheng's own career in groundwater flow and contaminant-transport modelling. His tribute showed how a scientific theory can travel across countries, institutions and generations: papers written decades earlier became formative reading for a young researcher and continued to influence the questions he asked throughout his career. Zheng's recollection therefore illustrated both the international reach of Tóth's work and its continuing ability to inspire new generations of hydrogeologists.



Ladislav Rybach

The “Hungarian Hydrogeology Mafia”

Ladislav Rybach’s tribute brought humour to the remembrance through the story of the self-styled “Hungarian Hydrogeology Mafia”. The name referred to a group of professors of Hungarian origin — Ladislav Rybach, Imre Müller, László Király and Joe Tóth — who were photographed together at the 1998 IAH Conference in Lausanne. The expression was playful, but the bond behind it was real.

Rybach’s recollection highlighted a close professional network built across national borders and academic institutions. Its members shared not only a common background, but also a culture of mutual support: they helped one another, exchanged ideas and maintained friendships throughout their international careers. In the context of the commemorative session, the photograph and the story offered a glimpse of Joe beyond his publications and theories — as a colleague embedded in a community of friends who valued loyalty, humour and professional solidarity.



Matthew Currell & Tom Gleeson

The 2013 Regional Groundwater Flow Symposium and Prof. Tóth’s 80th birthday celebration

This tribute returned to the 2013 International Symposium on Regional Groundwater Flow in Xi’an, China, organised by the IAH Regional Groundwater Flow Commission and the China Geological Survey. Professor Tóth attended as guest of honour, and the meeting also became a celebration of his 80th birthday. For many of the early-career hydrogeologists present, it was a rare opportunity to encounter the originator of groundwater flow-system theory not only through papers and textbooks, but in person.

The post-conference field trip to the Ordos Basin was particularly memorable. Joe shared his interpretation of the basin and showed how flow-system thinking could illuminate the hydrogeological features and processes of a large sedimentary system. At the same time, his dry humour and unmistakable personal style made a strong impression on the younger participants — so much so that some of the early-career hydrogeologists even tried to imitate his characteristic look in photographs from the event. The memory captured both sides of his influence: rigorous scientific insight and an ability to make learning a vivid, human experience.



Ádám Tóth

What does it mean to stand in the landscape where a scientific idea was born?

Ádám Tóth reflected on the unusual experience of standing in the very landscape where one of hydrogeology's most influential ideas was born. During a 2017 symposium organised by the IAH Regional Groundwater Flow Commission, he had the opportunity to visit sites in Alberta that inspired Joe Tóth's pioneering work on regional groundwater flow, including Ghost Pine Creek. Revisiting this landscape together with Joe made the theory tangible: the conceptual diagrams familiar from the literature were suddenly connected to the topography, geology and field observations from which they had emerged.

For Ádám, the experience also carried a personal dimension. As a fellow Tóth, he has often been asked whether he is related to Joe. In his tribute, he turned that coincidence of names into a reflection on scientific inheritance. Carrying the Tóth name in hydrogeology, he suggested, comes with a sense of responsibility: to understand the legacy, to keep it alive, and to contribute something new to the scientific tradition Joe created.



Okke Batelaan

Celebrating József (Joe) Tóth (1933–2026)

Okke Batelaan chose to remember Joe Tóth through a simple but powerful idea: that he embodied the beauty of science when science is surprising, inspiring and deeply human. Rather than separating the celebrated researcher from the person behind the work, his tribute brought the two together. Joe's scientific originality mattered, but so did the way he shared ideas, interacted with colleagues and made intellectual discovery a personal experience.

Batelaan's recollection drew on his own encounters with Joe, including the international field activities in the Canadian Prairies. In that setting, Tóth's science was inseparable from landscape, observation and discussion — the very ingredients from which his groundwater flow-system thinking had developed. The tribute therefore captured an important reason his influence endured: colleagues did not remember only a theory. They remembered the curiosity, enthusiasm and humanity of the person who made that theory come alive.



János Szanyi

The eternal secret of "Jóska"

János Szanyi's contribution was a personal farewell to a mentor and a reflection on Joe's enduring commitment to Hungarian hydrogeology. He recalled a remark associated with Tóth after his forced departure from Hungary: "I made a solemn vow, but what it entails is no one's concern but my own." Szanyi did not attempt to explain what that private vow may have meant. Instead, he looked at its consequences.

Whatever stood behind it, he argued, the result was visible in the decades of support Joe gave to hydrogeology in his homeland. His scientific knowledge, international experience and personal commitment all bore fruit in the Hungarian professional community. The mystery of the vow therefore became a way of speaking about loyalty without reducing it to a simple explanation. Szanyi ended not with a formal scientific conclusion, but with the traditional mining and geoscience greeting "Jó szerencsét!" — a brief, distinctly Hungarian farewell to the mentor he was remembering.



Brigitta Czauner

From basin hydraulics to personal memories: Remembering József Tóth

Brigitta Czauner described a scientific path that connected two generations of the Tóthian school. As a student of Judit Mádl-Szőnyi at ELTE, she first encountered regional groundwater flow through a tradition already shaped by Professor Tóth's ideas. Later, during part of her PhD studies at the University of Alberta, she had the rare opportunity to learn the practical "tricks" of basin hydraulics directly from Joe himself.

For Brigitta, this created a particularly personal relationship with the scientific legacy. She was not only studying a well-established theory; she was learning how its originator thought about hydraulic data, basin-scale interpretation and the questions that still remained open. Her tribute stressed that this legacy is far from exhausted: the flow-system approach continues to contain substantial, and in many areas still untapped, potential for new discoveries. At the same time, her memories reached beyond science. "Jóska bá" was not only an outstanding hydrogeologist, but a distinctive person whose warmth and character remained part of the experience of learning from him.



Teodóra Szőcs

The lasting legacy of Professor Tóth

Teodóra Szőcs concluded the commemorative session by placing Professor Tóth's influence within the broader history of Hungarian hydrogeology. His courses on regional groundwater flow systems introduced a conceptual framework that changed the way groundwater was understood in both research and practice. Over more than three decades at the Geological Institute of Hungary, this way of thinking proved useful far beyond academic theory.

Szőcs highlighted its application to a remarkably wide range of practical problems: the siting of radioactive-waste repositories, the characterisation of groundwater bodies, geothermal and contamination studies, and the interpretation of hydrochemical evolution along groundwater flow paths. She also emphasised that Joe's legacy was institutional as well as scientific. He actively supported the Hungarian hydrogeological community and encouraged the establishment of the Hungarian National Chapter of the IAH in 2006. Her closing message was therefore forward-looking: Tóth's legacy remains alive because flow-system thinking continues to connect fundamental hydrogeology with real-world problems, and because new generations continue to build on the community he helped strengthen.



Some of the speakers, colleagues and participants gathered after the Special Session for József Tóth.

VIDEO* | Watch reflections from the Special Session for József Tóth

** Note: This is an informal, unedited recording made during the Special Session. Although the video quality is limited, the recording captures the tributes in full and offers an opportunity to hear what colleagues, former students and friends shared about Professor József Tóth.*

A legacy carried forward

Taken together, these moments formed more than a formal commemoration. During the opening morning, Joe Tóth's own recorded voice once again addressed the international hydrogeological community. The **two keynote lectures** demonstrated how the scientific framework he pioneered continues to evolve, while the **Special Session** showed something equally important: the **extraordinary personal influence** he had on students, colleagues and friends around the world.

The Budapest Congress therefore became an occasion not only to remember Professor Tóth, but also to see how his ideas continue to live through **research, teaching, fieldwork, professional communities** and the **generations of hydrogeologists** he inspired.

KEEP IT FLOWING!

In memory of Professor József (Joe) Tóth, 1933–2026

