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## A Tribute to a Brilliant Scientist and Inspiring Teacher, Paul A. Witherspoon, former Foreign Member of the National Academy of Sciences of Ukraine

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**Вшанування пам'яті блискучого вченого та натхненного  
вчителя Пола А. Візерспуна, колишнього іноземного  
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This article highlights the significant legacy of Paul A. Witherspoon (1919–2012), a pioneering scientist in fractured rock hydrogeology and nuclear waste disposal in deep geological formations. Through his influential publications and contributions, this article aims to inspire both emerging and experienced scientists in the captivating field of earth sciences!

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Цитування: Файбішенко Б.А. Вшанування пам'яті блискучого вченого та натхненного вчителя Пола А. Візерспуна, колишнього члена Національної академії наук України. *Геологічний журнал*. 2025. № 1 (390). С. 66–69. <https://doi.org/10.30836/igs.1025-6814.2025.1.325110>

This article reflects on the memories of Paul A. Witherspoon (1919–2012), one of the world's leading hydrogeologists (Duncan and Voss, 2013). It references his publications and works about him to inspire young and established scientists in the earth sciences. I had a unique and fantastic opportunity to start working with Paul in January 1991. Engaging conversations and the vibrant stories I shared sparked his curiosity about Ukraine. In 1993, I was thrilled to coordinate a visit of a group of American scientists led by Paul to Kyiv, where he visited various institutions and connected with many talented researchers. Paul's visit included a fascinating tour of the National Academy of Sciences of Ukraine (NASU), where he met remarkable scientists from the Institute of Geological Sciences, the Institute of Geochemistry, and the Institute of Cybernetics. Inspired by the dedication and expertise of Ukrainian scientists he encountered, Paul took the initiative to foster collaboration between U.S. and Ukrainian scientists, launching an exciting program focused on hydrological studies related to contaminant transport at Chornobyl. His efforts were recognized when he was elected as a Foreign Member of the National Academy of Sciences of Ukraine. Paul returned to Ukraine in 1994, further solidifying these invaluable connections.

Paul was a role model known for fostering a research environment characterized by cooperation, excitement, and camaraderie. His students, who continued in academia, often tried replicating this supportive atmosphere. In today's scientific community, Witherspoon is still recognized for his exceptional ability to connect with people, build friendships, and cultivate trusted relationships with colleagues.

Paul played a significant role in shaping ideas and methodologies related to fractured rock hydrogeology. His interest in this area began with his early studies on caprock integrity for underground gas storage. As his career progressed, he focused more on the role of aquitards in hydrogeological systems. Eventually, he expanded his research to include thermohydrologic and hydromechanical couplings in geothermal systems and nuclear waste isolation in deep geological formations.

Paul and several of his students authored a highly acclaimed article titled "Validity of Cubic Law for Fluid Flow in a Deformable Rock Fracture" (Witherspoon et al., 1980). This paper is arguably one of the most influential works on fluid flow in a single rock fracture, having received about 3150 citations. Paul Witherspoon was a prominent pioneer in the field of contemporary fractured rock hydrogeology (Freeze et al., 2015).



A snapshot from the 1993 conference in Las Vegas, Nevada, USA, captured when Vyacheslav M. Shestopalov proudly presented the Diploma of a Foreign Member of the National Academy of Sciences of Ukraine to the esteemed Paul Witherspoon! From left to right: Paul Witherspoon, Vyacheslav Shestopalov, unknown, Boris Faybishenko

Paul was widely honored for his work. He was awarded the Horton Award from the American Geophysical Union (AGU) and the Meinzer Award from the Geological Society of America (GSA). In 1989, he was elected to the National Academy of Engineering for “pioneering work in geothermal energy, underground storage, hydrogeology, and the flow of fluids in fractured and porous rocks.” In 2001, he was elected a Fellow of the World Innovation Foundation.

Paul’s most significant legacy is his many students and colleagues, who benefited from his generous mentorship and lifelong friendship. Not surprisingly, Paul’s former students are also key scientists worldwide, including many outstanding hydrogeologists in the U.S., Canada, the U.K., and other countries. To show their appreciation, they honored him over the years with several memorable research conferences and symposia at Lawrence Berkeley National Laboratory (LBNL), on the occasions of his 60th, 70th, and 80th and 85th birthdays (Narasimhan, 1982; Faybishenko, 1999; Faybishenko and Witherspoon, 2004). The American Geophysical Union published three monographs on these events (Faybishenko et al., 2000, 2005, 2015).

Paul always enjoyed his international network of friends in China, France, Sweden, Ukraine, and many others. He had a basic understanding of several languages, more than most people you will ever encounter, and he consistently greeted others in their native tongues. Paul traveled extensively to give lectures and conduct courses around the world.

Paul Witherspoon initiated a scientific study of nuclear waste disposal in deep geological formations (Witherspoon, 2000). Paul edited the first four *Worldwide Review (WWR)* issues on nuclear waste disposal in geological formations (Witherspoon, 1991, 1996; Witherspoon and Bodvarsson, 2001, 2006). I edited the 5th *Worldwide Review on Geological Challenges in Radioactive Waste Isolation* (Faybishenko et al., 2016). The problem of nuclear waste disposal is vital for Ukraine, and Ukrainian scientists were invited to publish the results of their research in these issues (Khrushchov and Starodumov, 1996; Khrushchov and Tabachny, 2001; Shestopalov et al., 2016.)

Paul had an extraordinary gift that many highly intelligent people strive for: he could break down complex scientific concepts into simple, relatable language for everyone, regardless of age or background. I vividly recall when he effortlessly explained the water

movement issue in fractured rock at Yucca Mountain to a taxi driver in Nevada—such a brilliant moment! His passion for igniting curiosity was evident, as he made tough topics feel accessible and enjoyable. Paul had a genuine talent for fostering engaging conversations, always asking thoughtful questions that invited exploration and sharing. His attentive listening skills and warm demeanor helped others feel at ease, encouraging them to contribute their thoughts. Seeing how he connected with people was inspiring, making science understandable and enjoyable!

In 2015, the American Geophysical Union (AGU) established the “Paul A. Witherspoon Mid-Career Lecture Award in Hydrologic Sciences” to actively promote and honor excellence among mid-career scientists. This award targets those with 10 to 20 years of post-Ph.D. experience who are making significant strides in hydrologic sciences. As our scientific community boldly extends its reach – integrating fundamental hydrology with interdisciplinary approaches and societal needs – this award is essential for recognizing the critical contributions of emerging leaders in the field. While honoring its recipients, the Paul Witherspoon Award will also recognize Paul’s significant contributions – advancing the science of hydrology, applying it to socially important issues, and mentoring young hydrologists with dedication and inspiration. I hope that at one point, a Ukrainian scientist will be honored with the Paul Witherspoon Award.

To learn firsthand about Paul Witherspoon’s research and community-building perspective, view the videotaped interview he gave in 2007, posted on the International Association of Hydrogeologists (timecapsule.iah.org). A biographical article based on the interview was also published by IAH (Freeze and Javandel, 2008). As expressed in his obituary (EOS, July 31, 2012) “to enter Paul’s orbit was to experience a stimulating mix of high intelligence, deep curiosity, and love of life”.

Working with Paul was a transformative experience for me and many of his graduate students and colleagues. Throughout his long life and career in the Earth sciences community, Paul’s impact on advancing our field and empowering the next generation goes far deeper than one may realize. I encourage everyone to visit the AGU website to enrich your appreciation of Paul Witherspoon, the influential leader in hydrologic sciences: <https://connect.agu.org/hydrology/resources-ihp/paulwitherspoon>

Ця стаття висвітлює значну спадщину Пола А. Візерспуна (1919–2012), вченого-першопрохідця в галузі гідрогеології тріщинуватих порід та захоронення ядерних відходів у глибоких геологічних формаціях. Завдяки його впливовим публікаціям і вагомих здобуткам ця стаття має на меті надихнути як молодих, так і досвідчених вчених у захоплюючій галузі наук про Землю!

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