

SZEM

SZTE UNIVERSITY
OF SZEGED

SZEGED UNIVERSITY MAGAZINE | 2025

**AN ACADEMIC YEAR
OF SUCCESS
FOR SZTE**

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**SHANGHAI
RANKING**

**Best University
in Hungary**

**IN
2025
TOO!**

Dear Reader,

"To see what everyone else sees, but to think what no one else has thought" – these words from Albert Szent-Györgyi, Nobel laureate and former rector of the University of Szeged, continue to serve as a guiding principle for our university to this day. We believe that progress and innovation are the cornerstones of a successful society – and we remain steadfast in our pursuit of both. Few things demonstrate this more clearly than the fact that our community has given rise to numerous outstanding researchers, including Nobel Prize winner Katalin Karikó.

Innovation is not a standalone project at our university – it is a mindset that informs every aspect of our operations. To support this innovation-driven approach, we have established the Center of Excellence for Interdisciplinary Research, Development, and Innovation – the only such initiative in Hungarian higher education. This unique center brings together diverse research groups to foster collaboration and accelerate the practical application of new ideas.

Our conviction that we are on the right path was also reaffirmed by a recent honor: this year, the University of Szeged earned national recognition as University of the Year in the category of Innovation. This achievement reflects the progress we have made across key fields such as artificial intelligence, robotic surgery, and green technologies – advances made possible by cutting-edge infrastructure, strong international partnerships, and a deep-rooted commitment to innovation. At the core of this success is a spirit of renewal – one that has led us to reimagine how we operate and set new directions for the future. As a result, and with the support of the Foundation for the University of Szeged, we are now pursuing our goals with even greater clarity and efficiency.

It gives me particular pleasure to see our colleagues and students consistently receiving prestigious national and international accolades. Their dedication, expertise, and perseverance reveal the human side of innovation. Indeed, it is

this human element that contributes most to our university's success, solidifying its position at the forefront of both the national and the international scientific community.



Prof. Dr. László Rovó

Rector

No. 1 Again! UNIVERSITY OF SZEGED Still the Best University in Hungary

The 2025 edition of the Academic Ranking of World Universities (ARWU) – one of the world's most prestigious higher education rankings – has been released, confirming the University of Szeged once again as Hungary's number one university. SZTE remains the country's sole representative among the global top 500, with only four Hungarian universities making this year's list.



Released each year by the Shanghai Ranking Consultancy, the Academic Ranking of World Universities (ARWU) spotlights the world's leading institutions through a rigorous set of performance indicators. Widely regarded as one of the most authoritative measures of academic excellence, it is a list on which SZTE has long secured its place – consistently delivering results that rank it among the global elite.

In the 2025 ARWU List, the University of Szeged is once again recognized as Hungary's best university.

SZTE also maintains its strong international standing, ranking in the 401–500 bracket worldwide – a distinction unmatched by any other Hungarian university. Compiled by international experts, the global ranking draws on an evaluation of more than 2,500 universities, with only the top 1,000 making the cut. Factors range from the quality of education and the global recognition of professors, researchers, and alumni – including counts of Nobel and Fields Medal laureates – to research output, citation impact, and per-capita academic performance.

This year's position underscores the University of Szeged's breadth of excellence – spanning education, research, healthcare, and the arts – along with its active social role and far-reaching collaborations at home and abroad. From its campus on the banks of the Tisza River, the university sustains an extensive network of partnerships, many with fellow ARWU-ranked institutions. Within the European University Alliance for Global Health (EUGLOH) alone, nearly every member features on the global excellence list – from those in the top 150, such as Université Paris-Saclay, LMU Munich, and Lund University, to those in the top 300, including the University of Porto and the University of Hamburg, and even in the broader top 600 and top 800, such as UiT The Arctic University of Norway and the University of Alcalá.

The upper tier of the ARWU remains dominated by U.S. and U.K. powerhouses, led once again by Harvard University, followed by Stanford University and the Massachusetts Institute of Technology (MIT).

The full global ranking can be explored here:



Excellence Rewarded Brilliant Minds at SZTE

The list of Hungary's most prestigious national, academic, and municipal honors regularly includes individuals affiliated with the University of Szeged. Notably, two members of the twelve-person Hungarian Corvin Chain Board are connected to SZTE. In addition, over the past twenty-five years, twenty-four SZTE researchers have received the Hungarian Academy of Sciences Award – either individually or jointly – in recognition of their outstanding work. Furthermore, the ranks of Honorary Citizens of Szeged include many individuals who have pursued distinguished careers at the University of Szeged and made significant contributions to the local community. Overall, in the past decade alone, nine recipients of the Hungarian Academy of Sciences Award and nine honorary citizens of Szeged have made the University of Szeged proud through their achievements.

Members of the Hungarian Corvin Chain Board Affiliated with SZTE

- 2012** Zsolt Bor, laser physicist
2024 Katalin Karikó
Nobel Prize-winning biochemist

SZTE Researchers Honored with the Hungarian Academy of Sciences Award (2015–2025)

- 2015** Éva Jakab (Department of Roman Law, Faculty of Law and Political Sciences); Attila Nemes (Department of Internal Medicine II and Cardiology Center, Albert Szent-Györgyi Clinical

Center; Albert Szent-Györgyi Medical School); Gyula Pap (Faculty of Science and Informatics)

- 2016** Imre Lengyel (Institute of Economics and Economic Development, Faculty of Economics and Business Administration)
2017 Tamás József Kiss (Department of Inorganic and Analytical Chemistry, Faculty of Science and Informatics)
2018 Antal Péter (Department of Inorganic and Analytical Chemistry, Faculty of Science and Informatics)
2020 Enikő Németh T. (Department of General Linguistics, Faculty of Humanities and Social Sciences)
2022 Klára Sándor (Department of Cultural Heritage and Human Information Sciences, Institute of Social Sciences, Faculty of Humanities and Social Sciences)
2024 Tivadar M. Tóth (Department of Mineralogy, Geochemistry and Petrology, Faculty of Science and Informatics)

Members of SZTE Named Honorary Citizens of Szeged (2015–2025)

- 2015** Elemér Balogh, legal historian
2016 Benő Csapó, education researcher
2017 Sándor Pintér, pediatrician
2018 Gábor Szabó, physicist
2019 Mária Wolleemann, physician
2020 Márta Katona, neonatologist and pediatrician
2021 Katalin Karikó, biochemist
2022 Mihály Szajbély, literary historian
2023 László Vécsei, neurologist

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SZTE'S SZÉCHENYI PRIZE
RECIPIENTS

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INTERNATIONAL STUDENT
ENROLLMENT AT SZTE
RISES BY 25 PERCENT

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SZTE
THE MOST INNOVATIVE UNIVERSITY
OF THE YEAR

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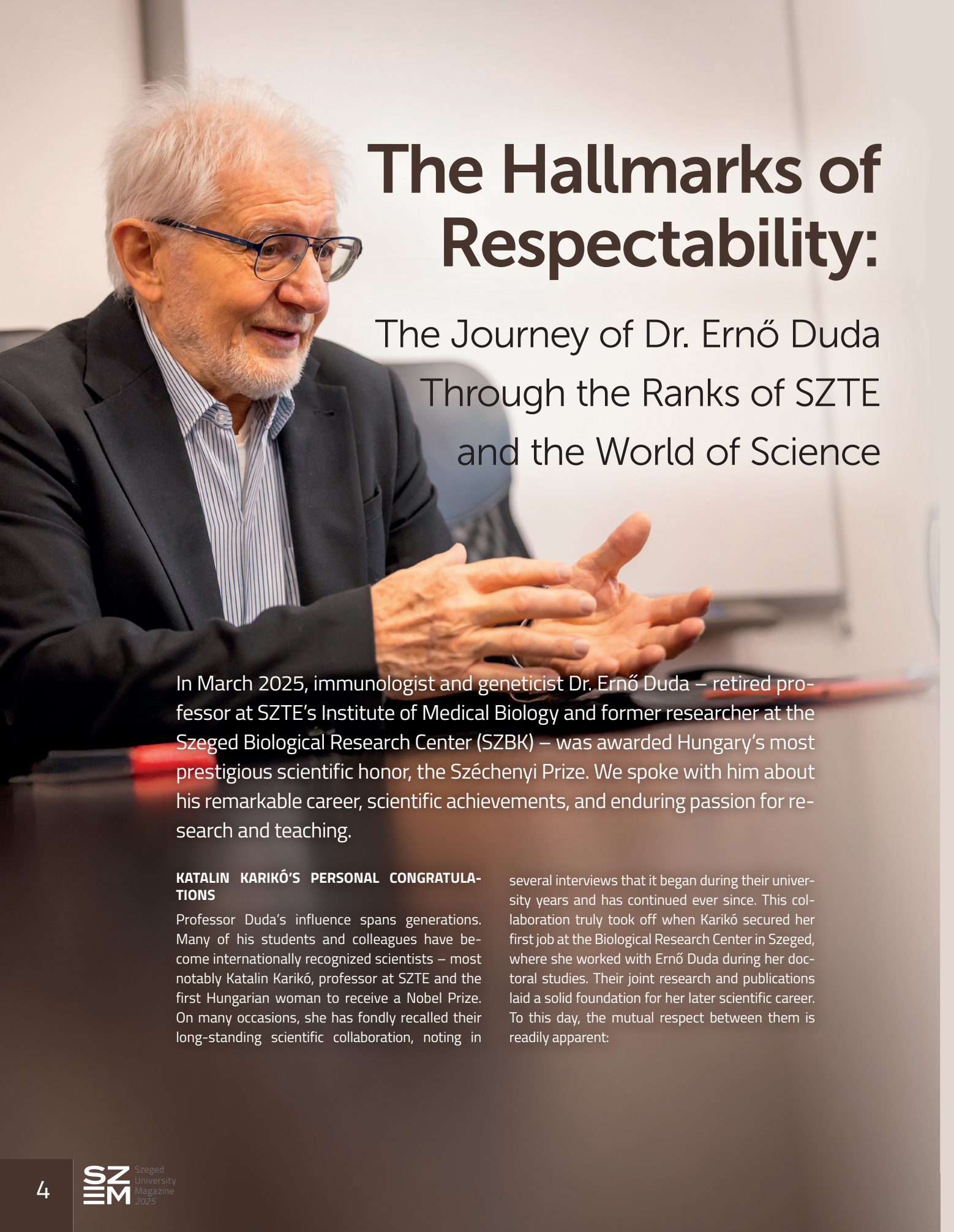
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The Hallmarks of Respectability:

The Journey of Dr. Ernő Duda
Through the Ranks of SZTE
and the World of Science

In March 2025, immunologist and geneticist Dr. Ernő Duda – retired professor at SZTE’s Institute of Medical Biology and former researcher at the Szeged Biological Research Center (SZBK) – was awarded Hungary’s most prestigious scientific honor, the Széchenyi Prize. We spoke with him about his remarkable career, scientific achievements, and enduring passion for research and teaching.

KATALIN KARIKÓ’S PERSONAL CONGRATULATIONS

Professor Duda’s influence spans generations. Many of his students and colleagues have become internationally recognized scientists – most notably Katalin Karikó, professor at SZTE and the first Hungarian woman to receive a Nobel Prize. On many occasions, she has fondly recalled their long-standing scientific collaboration, noting in

several interviews that it began during their university years and has continued ever since. This collaboration truly took off when Karikó secured her first job at the Biological Research Center in Szeged, where she worked with Ernő Duda during her doctoral studies. Their joint research and publications laid a solid foundation for her later scientific career. To this day, the mutual respect between them is readily apparent:



Professor Karikó was among the first to congratulate Ernő Duda on receiving the Széchenyi Prize.

"Being awarded the Széchenyi Prize is, of course, a tremendous honor, but to be honest, I'm still not quite sure what I did to deserve it," the professor says with a hint of humor. "Back in the day, I had a colleague who wrote a book about the lives of scientists, and he summed it up perfectly: As a young researcher, you dream of some extraordinary Nobel Prize. Then, as you mature, you'd settle for a regular one – or if that doesn't happen, maybe a Széchenyi or Kossuth Prize will do. And eventually, when you reach my age, you realize that the real achievement is just having that prestigious plaque of neighborhood respectability on your house – the one we used to have in Hungary, saying 'Tidy Yard, Neat House.' That's what I'm aiming for now," he adds with a smile.

THIRTY YEARS OF TEACHING AT SZTE

Professor Duda's path to Szeged was far from ordinary. "It's been 30 years since I started teaching here," he notes. Back then, there were plans to establish a separate immunology department, but they ultimately fell through.

Years later, following the retirement of Professor Ilona Béládi, then head of the Medical University's Institute of Microbiology, the rector proposed splitting the large department into three smaller ones: theoretical microbiology, clinical microbiology, and immunology. Professor Duda applied for the immunology chair but was passed over once again. "In the end, I was appointed as a professor – not of immunology, but microbiology. Ironically, I had always disliked microbiology since my university days – mainly because we had to learn it from poorly written textbooks," he confesses. Determined to catch up, he immersed himself in the latest microbiology books and quickly realized:

"It is a wonderful science."



FROM STRAUB TO SZENT-GYÖRGYI: A LEGACY OF SCIENTIFIC COLLABORATION

A pivotal chapter in Ernő Duda's life unfolded right after his university years, when he joined the Institute of Medical Chemistry at the Budapest Medical University – today known as Semmelweis University. The institute was headed by the renowned biochemist F. Brunó Straub, who would later go on to establish and serve as the founding director of the Szeged Biological Research Center. Additionally, Straub, as a distinguished student and close collaborator of SZTE's Nobel Prize-winning professor Albert Szent-Györgyi, played a pivotal role in the foundational biochemical research that validated Szent-Györgyi's discoveries and brought international recognition to scientific work emerging from the University of Szeged.

TWO YEARS AT THE UNIVERSITY OF WASHINGTON

In 1971, Ernő Duda joined the newly founded Biological Research Center (SZBK) in Szeged. The team was personally selected by F. Brunó Straub, who brought researchers from Budapest to establish the Institute of Biochemistry within SZBK. At the time, relocating from Budapest was not



Ernő Duda and Katalin Karikó
during a break at the mRNA Conference
in Szeged

BIOLOGICAL THERAPIES TRANSFORMING CANCER TREATMENT

In his research, Professor Duda's primary focus has been the development of cancer therapies – a field that has undergone a dramatic transformation over the past decade. Roughly ten years ago, biological therapies revolutionized oncology. Patients once considered untreatable – particularly those with advanced, metastatic cancers who were not treated because chemotherapy would have further reduced their quality of life – can now, in some cases, achieve full remission.

Today, complete recovery can be achieved for 20 to 30 percent of patients – and in some cases, for as many as 40 percent.

"Twenty years ago, this would've been unthinkable. It would have been considered a miracle. Now, we're weaponizing their own immune cells against tumors," he explains. "The process involves extracting T-cells – the immune cells capable of destroying tumor cells – from the patient's blood, genetically modifying them to specifically recognize and target the tumor, and then reinfusing these modified cells – often with stunning results." He adds that researchers are now working on creating universally applicable therapeutic cells from individual donors.

These innovations demonstrate just how far science – and passionate scientists – can go. Professor Ernő Duda's unwavering dedication to mentoring and teaching the next generation continues to serve as a compass for future researchers.

a particularly popular choice among scientists. However, one especially compelling promise helped attract many of them: after five years at SZBK, researchers would be granted the opportunity to spend a year abroad – not in the Eastern Bloc, but in the West.

Ernő Duda was able to spend two years at one of the leading medical institutions in the United States: the prestigious Washington University in St. Louis.

"It was an indescribable culture shock," he recalls, adding that after some time, his family was able to join him – and his wife even found a position working alongside a world-renowned researcher. Returning home equipped with cutting-edge knowledge that had yet to reach Hungarian universities, Professor Duda began offering extra-curricular lectures – often on virology and related subjects. "One of the buildings of the Faculty of Sciences of József Attila University, a legal predecessor of the University of Szeged, stood right next to the Biological Research Center, so I regularly went over to teach 'dumb things' to the students," he recalls with a laugh. He gave lectures on viruses and related topics – subjects that weren't officially part of the curriculum but fascinated him, and, to his delight, also sparked the students' interest.



Tímea FÜLÖP



Ádám KOVÁCS-JERNEY

Ilona ÚJSZÁSZI

THE NEXT GENERATION HOLDS THE KEY TO SCIENTIFIC PROGRESS

Professor András Varró, physician-biologist, professor emeritus at the Albert Szent-Györgyi Medical School of the University of Szeged, and one of the founders of the Hungarian National Academy of Scientist Education (NTA), has been awarded the Széchenyi Prize – alongside researcher Dr. Ernő Duda – in recognition of his exceptional scientific career and his dedication to nurturing young talent.

Among the many indicators of a nation's stature, its greatness can also be measured by the scientific achievements it can boast – and by its position on the global scientific map. This is why it is essential to cultivate young talent and to encourage the next generation to pursue careers in research. In this context, for decades, Professor András Varró has been dedicated to making the natural sciences more accessible to young people and to supporting those who feel called to a life in science – with all its challenges and rewards. His career stands as a powerful

example: having climbed every rung of the academic ladder and overcome numerous obstacles, he has risen to the highest levels in academia.

FROM A STUDENT RESEARCH GROUP IN SZEGED TO ONE OF THE NATION'S LEADING RESEARCH IN- STITUTES

His decision to pursue a research career was a conscious one, but not a surprising one – as science had always been close to Professor Varró. He grew up in

a family of physicians: his father, Dr. Vince Varró, was one of the University of Szeged's most renowned professors, serving as Director of the Department of Internal Medicine I, while his sister, Andrea Varró, is now Professor Emerita at the University of Liverpool and an honorary doctor of the University of Szeged. As he recalls, he never aspired to become a practicing clinician. Instead, he found his calling in research early on. While still a student, he began working under the guidance of Professor Gyula Papp at the former Institute of Pharmacology – now known as the Institute of Pharmacology and Pharmacotherapy at SZTE – as part of a student research group. His path then led to the Budapest Drug Research Institute, where he focused primarily on antiarrhythmic drugs for the treat-

ment of cardiovascular diseases, particularly cardiac arrhythmias. At the time, the institute served as the central research facility for the entire Hungarian pharmaceutical industry and held a prominent position in the country's scientific landscape. Since its primary mission was drug development, it offered fewer opportunities for theoretical or academically driven research. Nevertheless, Professor Varró remained there for ten years, during which he also spent a total of five years on research fellowships in the United States – two and a half years in Indianapolis and another two and a half in Cincinnati.

RETURNING TO SZEGED

Professor Varró eventually returned to his hometown of Szeged, where he continued his career at the Institute of Pharmacology and Pharmacotherapy. By then, the institute was led by Professor Gyula Papp, who offered him a position as a member of staff.

Professor Varró accepted the offer, but before taking up the post, he seized an exceptional opportunity:

He spent a year and a half at Liverpool's world-renowned research institute.

There he worked alongside cardiovascular physiologist Professor David A. Eisner. When he returned to Szeged for good in 1992, Professor Papp – then already serving as department head – granted him a remarkable degree of autonomy, allowing him to establish his own research group. From then on, his was a textbook career path, marked by smooth and steady progress: he began as a lab leader and eventually rose to head the institute. From 2011 to 2014, he also served as Vice-Rector for Scientific Affairs and Innovation at the University of Szeged. Even after retirement, he continued his work as a research professor of pharmacology. Upon turning 70, he was awarded the title of professor emeritus. Today, he remains active in research as a member of the HUN-REN-SZTE Research Group for Cardiovascular Pharmacology.

SZÉCHENYI PRIZE RECIPIENTS WITH TIES TO THE UNIVERSITY OF SZEGED (2020–2025)

KATALIN DÁVID (1923–2023), art historian – 1995 (Széchenyi Prize), 2021 (Széchenyi Grand Prize)

ERNŐ DUDA (1943–), geneticist, virologist – 2025

FERENC IGLÓI (1952–), solid-state physicist – 2020

KATALIN KARIKÓ (1955–), biochemist, member of the Hungarian Academy of Sciences – 2021

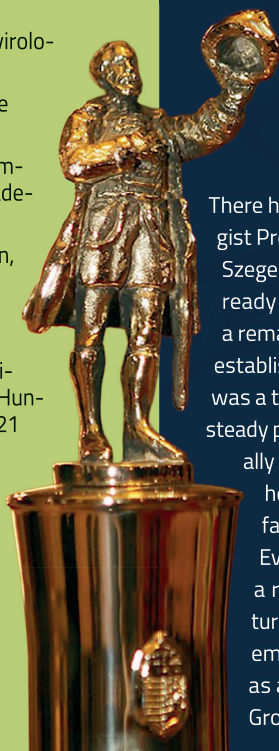
LAJOS KEMÉNY (1959–), physician, dermatologist, member of the Hungarian Academy of Sciences – 2021

ÁKOS MESTERHÁZY (1945–), agricultural engineer, member of the Hungarian Academy of Sciences – 2021

ISTVÁN SIMON (1947–2024), biophysicist, member of the Hungarian Academy of Sciences – 2024

GÁBOR SZABÓ (1954–), physicist, member of the Hungarian Academy of Sciences – 2024

ANDRÁS VARRÓ (1954–), physician, pharmacologist – 2025



CREATING ONE OF HUNGARY'S LEADING NETWORKS FOR FOSTERING TALENT

One of the most important pillars of Professor Varró's work is empowering the next generation of scientists. Beyond mentoring undergraduate students, PhD candidates, and early-career researchers, he has played a central role in creating pathways for young people with a scientific calling. As a co-founder and current chair of the board of trustees of the National Academy of Scientist Education (NTA), he has significantly contributed to helping young talents take their first steps toward a scientific career. His involvement in talent development began in 2012, when a new foundation was established: the Foundation for the Future of Biomedical Research in Szeged. This served as the predecessor to today's National Biomedical Foundation and launched the Szeged Scientist Academy Program.

Backed by growing professional and public support, the Szeged Scientist Academy Program evolved into a nationwide initiative – continuing its mission since September 2021 as the National Academy of Scientist Education.

Today, the Academy stands as one of Hungary's most important scientific talent development networks. Its goal is to support young people interested in biomedical research starting from secondary school, to make the scientific career path attractive to them, and to help ensure that the next generation of researchers envision their future in Hungary.

INTERNATIONAL EXPERIENCE AS A NECESSITY

As Professor Varró emphasizes, gaining international experience plays a vital role in every researcher's career. "In Hungary, this may be even more important than in countries like France or Germany," he notes. He adds that it is standard practice worldwide for young researchers to continue their work in a leading international laboratory after earning their PhD – whether in Europe, Canada, the United States, Japan, or anywhere else in the world. "Working under the guid-



ance of a globally recognized mentor, they can acquire knowledge and skills that are often inaccessible in their home environment. The goal is to bring that expertise back and integrate it into the scientific community they came from."

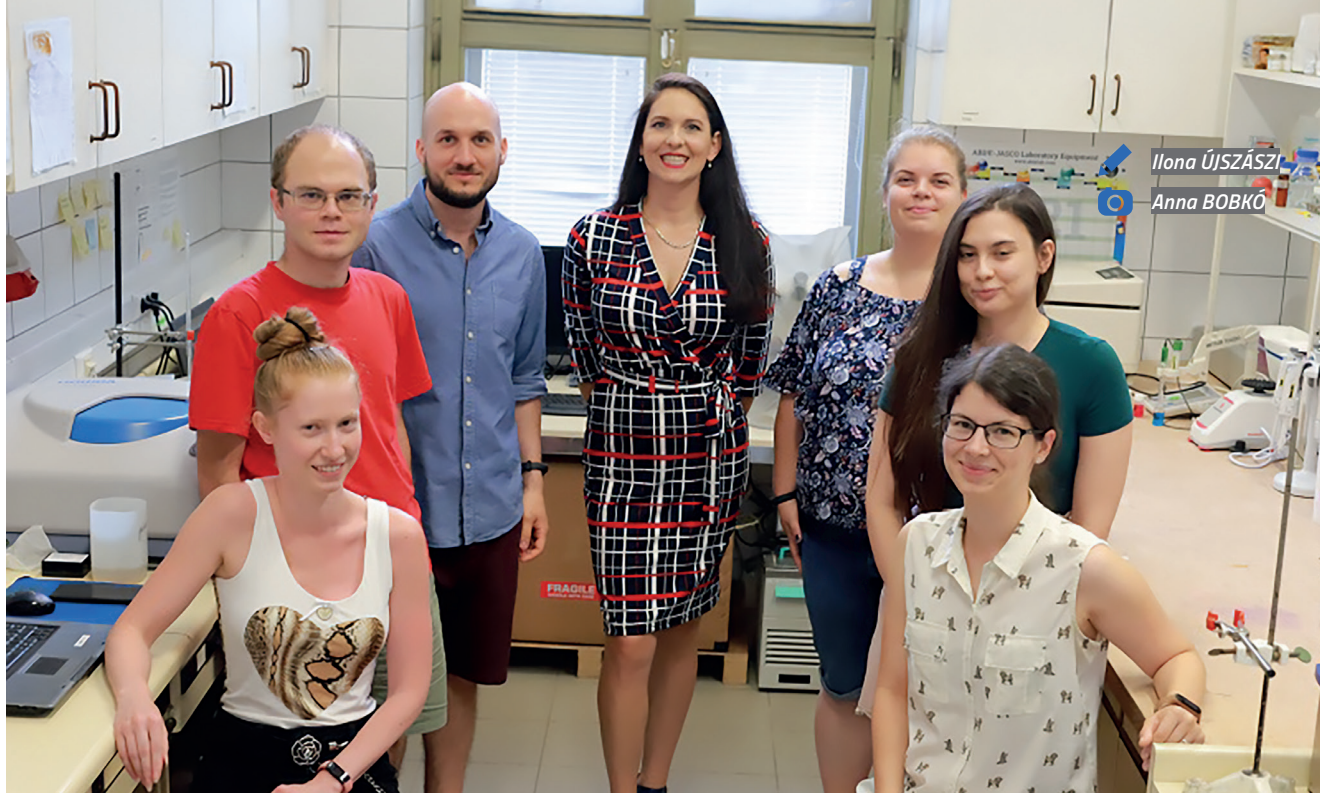
THE ULTIMATE GOAL: A NEW NOBEL LAUREATE FOR HUNGARY

Professor Varró believes that the mission of the National Academy of Scientist Education is to nurture a new generation of researchers capable of keeping pace with the international scientific elite – and to encourage them to remain in Hungary after completing their studies. He says the ultimate goal is for Hungary to have another Nobel Prize-winning scientist, noting that Katalin Karikó's life demonstrates just how successful a Hungarian scientist can be.

Katalin Karikó's career serves as a powerful inspiration for all young people considering a future in research.

Guiding the next generation of scientists continues to be a driving force in Professor András Varró's plans for the future. "I'm over seventy now. It's no longer my duty to chase new discoveries – that's now the task of the next generation," he says. "I'd like to complete the scientific projects I'm currently working on, but beyond that, I don't plan to apply for new grants. Instead, I see my future role as that of a mentor. That's why I consider it especially important to support young researchers and to help ensure that scientific knowledge and curiosity are carried forward," the professor concludes.





"You'll find gold wherever you look for it."

As head of the MTA-SZTE Lendület (Momentum) research group Noble Metal Nanostructures Research Group, established in 2021 with support from the Hungarian Academy of Sciences, Edit Juhászné Csapó is exploring the biomedical potential of newly developed materials together with a visiting professor from Krakow. A Doctor of the Hungarian Academy of Sciences, she also serves as an associate professor at the Department of Physical Chemistry and Materials Science at the University of Szeged, where she is a popular and highly regarded instructor among students.

"During the first three years of my grant project, we focused primarily on synthesizing a variety of new noble metal nanostructures – mainly gold-based. This formed the preparative, chemistry-focused core of the project," says Edit Juhászné Csapó, summarizing the group's early achievements. "Over that period, we published nearly forty papers. By

2026, we hope to begin testing these newly developed materials in biomedical applications," she adds.

The research group has optimized the synthesis process for twenty-five new nanostructured materials. Their goal was to determine how the production procedure could be fine-tuned to produce

materials that fluoresce – emitting blue, yellow, or red light.

“Marek Wojnicki works in a similar field, and part of his research aligns with my grant project as well,” says Edit Juhászné Csapó. “The visiting professor from the Department of Physical Chemistry and Metallurgy at AGH University of Science and Technology – a mining university in Poland – is collaborating with us to develop fluorescent nanostructures primarily based on carbon. However, a key requirement is that these materials must possess both fluorescent and magnetic properties. Our goal is to create entirely novel materials – ones not found in nature – that can serve as contrast agents for MRI diagnostics. That’s why our Academy-funded project bears the title *‘Dual Contrasts – A Rising Star in Oncology.’*”

The nanostructures carry small molecules that function as sensors, capable of detecting tumor cells, for instance. Once detection occurs, the fluorescent light emitted by the particles changes. In the future, experts may even be able to diagnose early-stage cancer using nano-gold injected into the body.

Teaching is another area where Edit Juhászné Csapó finds deep fulfillment: “I really enjoy teaching pharmacy and chemistry students,” she emphasizes. In fact, she has been teaching at the university since 2017 – and seeing the list of her PhD students inevitably brings to mind the title of her sold-out public lecture: *“You’ll Find Gold Wherever You Look for It.”*

UNIQUE INSTITUTE, UNIQUE INDIVIDUAL

Edit Juhászné Csapó leads one of three Lendület (Momentum) research groups based in the University of Szeged’s Institute of Chemistry – one of the institution’s most successful academic units. What makes her achievement even more remarkable is that she is the youngest female researcher in the past 15 years to earn the title of Doctor of the Hungarian Academy of Sciences in the field of experimental (non-theoretical) chemistry.

22 PRESTIGIOUS RESEARCH GRANTS AWARDED TO 19 SCHOLARS AT SZTE:

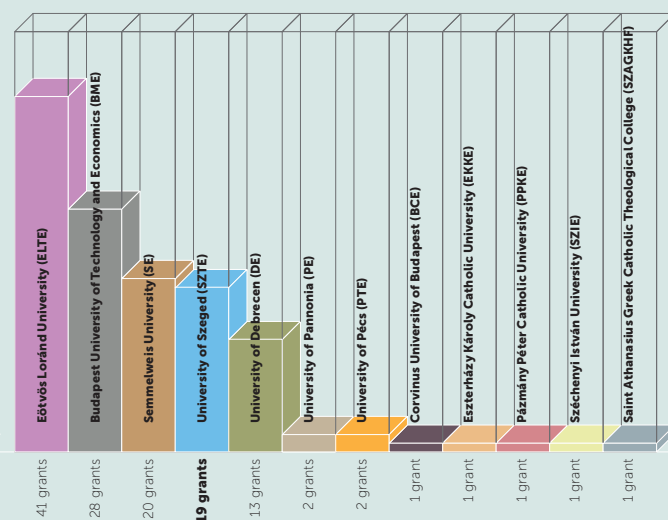
Between 2011 and 2023, 16 researchers from the University of Szeged were awarded a total of 19 Momentum (Lendület) research grants. These prestigious grants supported the work of 16 research groups operating in partnership with the Hungarian Academy of Sciences and the University of Szeged, with three researchers – *Antal Berényi*, *Gábor Czakó*, and *István Szilágyi* – receiving the grant twice. The first SZTE recipient of a Momentum grant was *Tamás Martinek*, who earned the distinction in 2011. Since then, the university has seen a growing number of successful applicants, including *Ákos Kukovecz*, *Péter Hegyi*, *Csaba Janáky*, *Csongor István Nagy*, *Tamás Papp*, *József Maléth*, *Attila Gácsér*, *Eva Anna Enyedy*, *Dóra Tombácz*, *Edit Juhászné Csapó*, *Csaba Tölgyesi*, and *Zsuzsanna Ördögné Kolbert*. In the 2025 round of the Momentum program, the Hungarian Academy of Sciences is supporting the cutting-edge research of three additional researchers at SZTE: *Balázs Endrődi*, *Gábor Feigl*, and *Csaba Szabó*.

MOMENTUM PROGRAM SUCCESSSES AT SZTE:

The Momentum (Lendület) program – established by the Hungarian Academy of Sciences to support outstanding young researchers – was first announced by the Academy’s president on January 14, 2009. Initially available only to institutes of the Academy, the program was later extended to universities as well. Among Hungary’s four major research universities (the University of Debrecen, Eötvös Loránd University, the University of Pécs, and the University of Szeged), SZTE ranks as the second most successful in securing Momentum grants – making it one of the country’s leading centers for high-level academic research.

MOMENTUM GRANT ALLOCATIONS (2011–2023):

Between 2011 and 2023, a total of 130 Momentum (Lendület) research grants were awarded to researchers affiliated with 12 Hungarian universities.





INTERNATIONAL STUDENT ENROLLMENT AT SZTE RISES BY 25 PERCENT

The University of Szeged welcomed its newly admitted international students with a three-day series of events held between September 2 and 4. In the new academic year, approximately 1,500 students from 132 countries are set to begin their studies at SZTE.

Compared to last year, international student enrollment at the University of Szeged has risen by 25 percent. Of the roughly 1,500 newcomers, about 240 will begin their studies with a Stipendium Hungaricum scholarship, 159 with ERASMUS+ and CEEPUS scholarships, while around 1,000 will be self-financed students.

In the 2025–2026 fall semester, SZTE will welcome 157 **ERASMUS+** students from 73 universities in 61 cities across 11 countries, who will be studying at 11 different faculties of the university. The majority of ERASMUS+ scholarship holders come from Spain, while significant numbers of students from Turkey, Italy, and France have likewise chosen the University of Szeged as their academic destination. Among the most popular programs are those offered by the Albert Szent-Györgyi Medical School, the Faculty of Humanities and Social Sciences, the Faculty of Economics and Business Administration, and the Faculty of Law and Political Sciences. In addition, many students are beginning their short-term, non-degree studies at the Juhász Gyula Faculty of Education, the Faculty of Engineering, the Faculty of Pharmacy, and the Faculty of Science and Informatics. Meanwhile, under the **CEEPUS** program, one Austrian and one Slovak student will also join the Faculty of Humanities and Social Sciences and the Faculty of Engineering. The **Stipendium Hungaricum** scholarship program also plays a major role

in shaping the international community at SZTE. The largest groups of scholarship holders are coming from India, Turkey, South Korea, Jordan, Japan, and Pakistan, with most of them drawn to programs at the Albert Szent-Györgyi Medical School, the Faculty of Science and Informatics, and the Faculty of Humanities and Social Sciences.

Alongside scholarship holders, a large number of self-financed students are also choosing the University of Szeged. Among the nearly one thousand self-financed international students, programs in the health sciences, law, and economics are especially popular, owing to the internationally recognized degrees they lead to. These students come from 86 different countries, with the largest groups arriving from China, Turkey, Germany, Pakistan, and Iran.

During the three-day welcome event for first-year international students, twelve newcomers received the **SZTE START** scholarship – a €500 grant designed to support their integration and academic journey. In addition to the scholarship awards, the orientation program offered opportunities for students to meet their mentors, learn about available services, and take part in team-building activities and information sessions to help them settle in. The program concluded in front of SZTE's main building on Dugonics Square with the traditional freshmen's oath, followed by a lively celebration.



“The right knowledge lies in the middle ground.”

Do people prefer to get treated with medicinal plants or synthetic drugs? Can St. John's wort really lead to an unwanted pregnancy? To find out, we spoke with Dr. Dezső Csupor – Head of the Institute of Clinical Pharmacy at the University of Szeged's Faculty of Pharmacy, and a pioneer in making science accessible to the public.

Q: Can combining prescribed medications with natural or alternative remedies lead to better outcomes?

A: If chosen well, different forms of treatment can actually complement each other. For instance, urinary tract infections are often treated with antibiotics, and there are certain medicinal plants that can be taken alongside these

without any issues, potentially speeding up recovery. However, there are combinations where interactions may cause problems. Grapefruit, for example, inhibits liver enzymes responsible for breaking down active ingredients in medications, which can enhance the drug's effect. Another good example is St. John's wort, a plant with antidepressant properties. Unlike grapefruit, it accelerates the breakdown of other medications. This is especially relevant in certain situations, such as oral contraception. People taking contraceptives often don't think of themselves as being on medication, because they're otherwise healthy. But if they start taking St. John's wort for mild depression or mood swings, an

unwanted pregnancy could result – as the plant lowers the levels of hormones responsible for the contraceptive effect.

Q: Some people consider all herbal treatments to be pure quackery, while others believe only in medicinal plants and reject all synthetic medications. But how large is the group that manages to stay in the middle ground?

A: The right knowledge lies in the middle ground.

Generally speaking, the public tends to have a positive bias toward medicinal plants.

In contrast, healthcare professionals are more inclined to view them with skepticism. But the truth is somewhere in between. In my experience, that middle ground is also the narrowest. And not just in this area – people tend to form extreme opinions in general.

Q: What is the proportion of synthetic and plant-based medicines available in pharmacies?

A: There are medications made specifically from medicinal plants – around a hundred such products are available in Hungary. Then there are fully synthetic drugs, which are created entirely in laboratories from original molecular designs. But the majority fall somewhere in between: a naturally occurring active compound – not necessarily plant-based, as it may also come from fungi or animals – serves as the basis for a drug that is then synthetically reproduced and refined. These drugs work essentially the same way as the natural compound, but they are slightly modified to enhance their effect and potency, or to extend how long they remain active in the body. According to various estimates, about 50–60 percent of today's medicines fall into this category.



 Helga BALOG

 Ádám KOVÁCS-JERNEY

Singing: An Addiction that Elevates the Soul

Eszter Sümegi, instructor of solo voice at the University of Szeged's Bartók Béla Faculty of Arts (SZTE BBMK) and, as of July 1, associate professor, was recently named "Vocal Artist of the Year" by Bartók Radio. Soon after, she was also inducted into Hungary's *Company of Immortals* as a lifetime member in the opera singer category. Such accolades prompt a deeper look into what the profession demands. *Why must an opera singer stay in constant training? And why is it impossible to perform a Wagner role while singing other parts at the same time?* We spoke with the Kossuth Prize-winning soprano about these and other topics.

Q: What is something outsiders might never guess about the profession of opera singing? What are the greatest challenges and joys?

A: It's the most beautiful profession in the world. In fact, it's not just a profession – it's a calling. To interpret the works of Mozart, Vivaldi, Kodály, or Bartók is pure magic. It demands a disciplined lifestyle, much like that of a professional athlete. When there's a concert or performance, there's no staying out late, no alcohol, no smoking – not that I do any of these anyway – and you have to know in advance how many months it will take to learn a piece. For a role to feel truly visceral, you may need two years of study – as is the case with a role like Isolde. You can't walk on stage with a half-prepared performance and tell the audience, "Sorry, I didn't have time."

Q: Do you ever learn or perform multiple roles at the same time? If so, how do you shift between them emotionally?

A: When I was very active on stage, I sometimes carried seven leading roles in a single season at the Opera House. So, we had to plan well in advance: *when, for how long, and what to focus on.* At the same time, Italian operas are easier to learn simultaneously because the language is more melodic and accessible than German. With German operas – like those of Wagner or Strauss – you need more time. Wagner, in particular, is hegemonic; it doesn't tolerate anything alongside it. It's incredibly demanding vocally and physically. It requires strong muscles – back muscles, abdominal muscles – so singers really have to stay sharp, or their careers could be over in five to ten years.

Q: Is this why physical training is necessary for such demanding roles?

Absolutely. That's why I used to work out. I was never much of a runner, though. But I had a home gym and would cycle more than twenty kilometers daily or every other day. This calling requires endurance and proper breathing technique. Singing is 70–75% breath control. Many people don't realize how physically intense it is because none of the strain shows on my face. But I need to be able to kneel, run, and endure a four- or five-hour opera.



Helga BALOG

Ádám KOVÁCS-JERNEY



THE FUTURE OF OUR RESOURCES

The University of Szeged hosted the 2025 International Student Leaders Meeting on Sustainability, organized by the UI GreenMetric university network. The event brought together nearly 100 student sustainability leaders, instructors, and researchers from 50 universities around the world. Among the highlights was a panel discussion featuring five researchers from the University of Szeged, who shared the sustainability challenges specific to their respective fields of expertise.

Dr. József Maléth, a physician-researcher at the Department of Internal Medicine I at SZTE's Albert Szent-Györgyi Clinical Center, has launched a multidisciplinary research program – in collaboration with other university researchers – to investigate the effects of micro- and nanoplastics on the human body. Building on his earlier research on epithelial cells, Dr. Maléth is now examining how plastics entering the body may affect the function of these cells.

"Sustainability, for us, means preserving human health. We are convinced that human health cannot be separated from the health of our environment," Dr.

Maléth explained. "That's why we aim to understand how environmental conditions – such as the presence of micro- and nanoplastics – influence cellular function. And it's epithelial cells that are the first to encounter these environmental factors. If these cells are unable to perform their functions properly, it can lead to disease over the long term."

Dr. István Sisák, senior research fellow at the Institute of Plant Sciences and Environmental Protection at the University of Szeged's Faculty of Agriculture, is currently developing advanced training programs in precision agriculture focused on the environmental aspects of land use.

"Soil is a non-renewable resource – at least on a human timescale. Once it degrades, it can take hundreds of years to regenerate. So, the goal of precision agriculture is to achieve maximum efficiency with minimal intervention and the lowest possible use of materials; that's the cornerstone of sustainability in agriculture."

Prof. Dr. Zoltán Bajmócy, full professor at the Institute of Ecological Economics within the University of Szeged's Faculty of Economics and Business Administration, defines his field as ecological economics – a discipline that examines how the economy is embedded in both social and environmental systems. His research focuses on social justice, human well-being, and environmental sustainability.

"According to ecological economics, sustainability means aligning economic activities with the ecological limits of the planet. This notion connects environmental and social justice – it's not only about what we produce and how, but also about for whom and for what purpose."

"True sustainability can only be achieved if both social inequalities and environmental exploitation are reduced."

Dr. Csaba Janáky, associate professor at the Department of Physical Chemistry and Materials Science, and Head of the Competence Center for Materials Science, Environmental Science, and Energy Science at the University of Szeged's Center of Excellence for

Interdisciplinary Research, Development, and Innovation (IKIKK), leads a research group focused on developing technologies for energy and CO₂ conversion in the field of circular electrochemistry.

"In my view, sustainability is about the efficient and environmentally conscious management of material and energy flows. This includes implementing a circular economy to ensure that products and raw materials remain in the system as long as possible. It also involves designing new technologies with recyclability and minimal environmental impact in mind from the outset."

Dr. Tamás Gál, climatologist and associate professor, is Head of the Department of Atmospheric and Spatial Data Sciences at the University of Szeged's Faculty of Science and Informatics. His research focuses on urban climate and the city-level impacts of climate change. The recent establishment of the Interdisciplinary Climate Change Research Group at the University of Szeged, under his leadership, also underscores the fact that sustainability and climate change can only be addressed through a broad, interdisciplinary approach.

"In climatology, sustainability is perhaps best summed up as a combination of adaptation and prevention. We need to learn how to live in ways that both reduce the impacts of climate change and curb our own contributions to it – for example, by cutting greenhouse gas emissions. In terms of urban climate, this also means creating city environments that are more resilient to heatwaves, flooding, and other extreme weather events."

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Is Mental Exercise the Secret to Longevity?

Professor Emerita
Ilona Béládi
Turns 100



 Ilona ÚJSZÁSZI
 Anita KOVÁCS

On August 6, 2025, Professor Emerita Ilona Béládi celebrated her 100th birthday. A pioneering figure in the history of medical education in Szeged, she was the first woman ever appointed as Head of Department at the university. In 1974, she became Director of the Institute of Microbiology at the Medical University of Szeged (SZOTE) – the predecessor of today's Albert Szent-Györgyi Medical School at the University of Szeged.

A towering floral arrangement – reminiscent of a layered birthday cake and adorned with 100 roses – greeted guests who had gathered to celebrate 100-year-old Ilona Béládi. The unique gift was sent by one of Professor Béládi's former students, Professor Dr. László Rovó, Rector of the University of Szeged. As he was unable to attend in person, his well wishes were conveyed by Professor Dr. Márta Széll, Vice-Rector for Strategic Planning, who presented Ilona Béládi with SZTE's most prestigious honor, the *Pro Universitate* Award.

"My mother never lets her mind go idle – not even for a minute. On her walks down the corridor, she'll pause to play a quick round of solitaire," said Ilona Béládi's elder son Tamás Oláh a year ago on his mother's 99th birthday. "Keeping the brain active – that's the secret to a long life," he added.

Speaking on behalf of the Albert Szent-Györgyi Medical School and its alumni, Professor Dr. Mária Dux, Vice-Dean, conveyed their heartfelt birthday wishes and gratitude as she presented a granite diploma and a jubilee cake to the Professor Emerita.

"Even fifty years ago, balancing responsibilities at home and at work was a challenge for women," Ilona Béládi reflected.

Born in Szeged, Ilona Béládi earned her medical degree in the university city in 1950. She remembers her former professor and supervisor, György Ivánovics, member of the Hungarian Academy of Sciences, as a broad-minded and exceptionally knowledgeable leader. It was in his well-organized institute that she began working as a third-year medical student. Later, as a researcher, she focused on viruses and interferon. Advancing steadily through the academic ranks, she found herself in the right place at the right time when Professor Ivánovics retired: in 1974, she was appointed Director of the Institute of Microbiology at the former Medical University of Szeged – now the Albert Szent-Györgyi Medical School of the University of Szeged.

"I was fortunate to take over an institute that was better equipped than the average university de-



partment back in the 1970s," she recollected. "Dedicated, time-intensive work requires a stable and trouble-free environment – and I had that. I've been lucky."

Joining the celebration online from Philadelphia, Nobel laureate Katalin Karikó emphasized the importance of daily goal-setting and purposeful engagement, drawing inspiration from the example of Ilona Béládi. She expressed her delight at being able to greet someone she has long known and admired, saying:

"Happy 100th birthday!"

UNDER THE MAGNIFYING GLASS: 200 YEARS OF THE HUNGARIAN ACADEMY OF SCIENCES AND 65 YEARS OF THE ACADEMY'S REGIONAL COMMITTEE IN SZEGED

The Hungarian government has declared both 2025 and 2026 the Year of Hungarian Science. A series of exhibitions, publications, films, conferences, and other programs serve to commemorate the bicentenary of the Hungarian Academy of Sciences (founded in 1825) and its library (in operation since 1826). This major anniversary coincides with the 65th anniversary celebrations of the Academy's first regional committee, the Szeged Regional Committee (SZAB), founded in 1961.

MAGIC POWER – KNOWLEDGE. COMMUNITY. ACADEMY.

The Hungarian Academy of Sciences' exhibition at the Hungarian National Museum highlights key moments in the scientific history of Szeged, including a letter from Nobel laureate *Albert Szent-Györgyi*, along with the Nobel medal and honorary certificate of *Katalin Karikó*, Hungary's first female Nobel Prize-winning scientist.

"SCIENCE FOR ME"

In a series of videos made by the Hungarian Academy of Sciences, 23 researchers share their thoughts on the role of science in society and their personal connection to their field, including astronomer *László Kiss* and Nobel Prize-winning biologist *Katalin Karikó*, both of whom are affiliated with the University of Szeged.

A CENTURY OF ACHIEVEMENT: 118 MEMBERS OF THE HUNGARIAN ACADEMY OF SCIENCES AFFILIATED WITH SZTE ACROSS 104 YEARS

The temporary exhibition showcases the contributions of members of the Hungarian Academy of Sciences who have held positions at the University of Szeged. Launched in the fall of 2025, it is presented in virtual format on the University Library's *Contenta* repository site, serving both educational and outreach purposes.

A CROSS-SECTION OF 65 YEARS OF THE SZEGED REGIONAL COMMITTEE OF THE HUNGARIAN ACADEMY OF SCIENCES (SZAB)

According to Tibor Krisztin, member of the Hungarian Academy of Sciences and President of SZAB, the founding of the Hungarian Academy of Sciences' first regional committee – in Szeged – is underpinned by the fact that *"The University of Szeged was the strongest bastion of high-level science outside the capital, and remains the only research institution in Hungary where research carried out on site has been recognized with a Nobel Prize. Crucially, much of Szeged's contributions to science rested on the foundations laid by the scholars of the University of Kolozsvár (Cluj-Napoca), whose professional stature and intellectual legacy were carried forward and expanded in Szeged."*

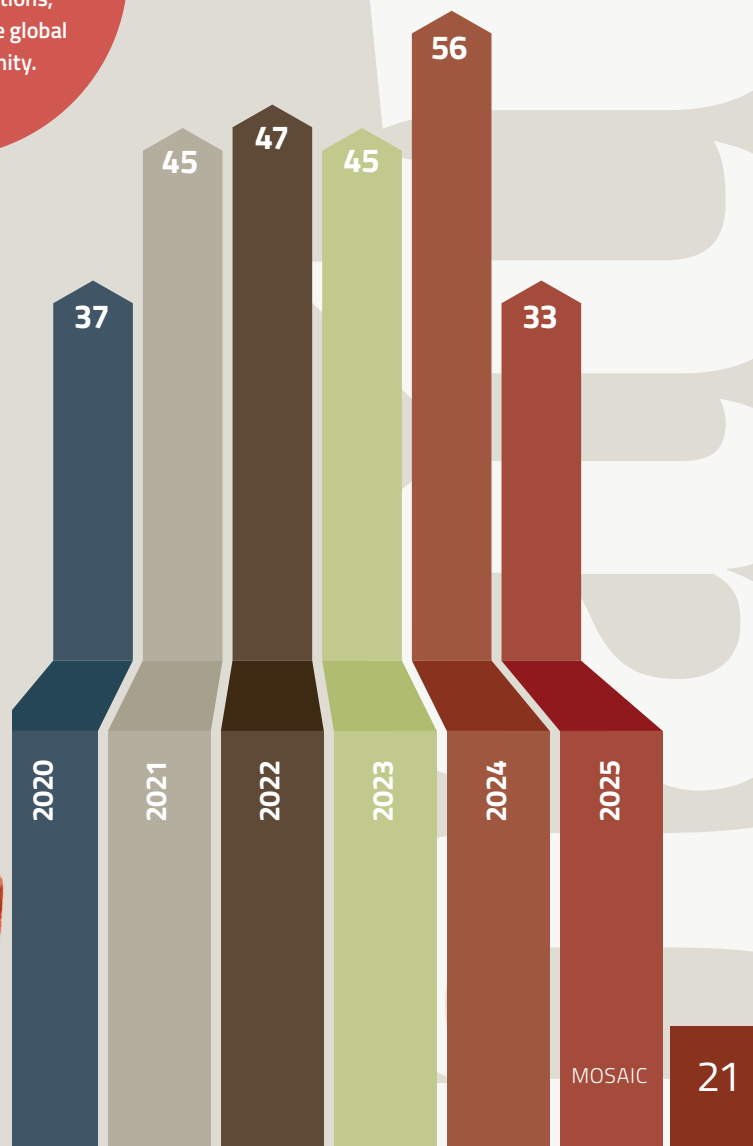
Katalin Karikó's Nobel medal and diploma are on display at the temporary exhibition of the Hungarian National Museum. At the ceremony held on May 5, 2025, to mark the placement of these treasured artifacts, the following attended (from left to right): Tamás Freund, President of the Hungarian Academy of Sciences; Nobel laureate researcher Katalin Karikó, Professor at the University of Szeged; Gábor Zsigmond, Director General of the Hungarian National Museum; Szilárd Demeter, President of the Public Collections Center of the Hungarian National Museum. (Photo by István Sahin-Tóth)

Photo: Ádám Kovács-Jerney

SZTE PUBLICATIONS FEATURED IN THE *NATURE* PORTFOLIO

Each year, a significant number of publications by the University of Szeged's lecturers and researchers appear in journals that are part of the *Nature* portfolio. The chart below shows how many publications have featured SZTE-affiliated authors since 2020.

Founded in 1869, *Nature* is a prestigious British scientific journal that has since evolved into a wider portfolio of publications, primarily serving the global research community.





WHAT DOES A GHOSTWRITER DO?

Róbert Illés, an SZTE alumnus, graduated with a degree in teaching but moved on from the profession when his career as a literary translator took off. In 2024, however, he briefly returned to both the university and the classroom, holding a course in literary translation as part of the master's program in Hungarian Language and Literature. He also works as a writer for others and, among his numerous projects, ghostwrote the autobiography of popular Hungarian singer Charlie Horváth.



Helga BALOG

Ádám KOVÁCS-JERNEY

Q: What is a ghostwriter, and why do people need one?

A: The question of why someone might need a ghostwriter comes up more frequently in countries like Hungary, where the practice is still in the process of gaining broader acceptance. In the US, for instance – where people don't assume they can do everything themselves – it's not really an issue.

It's perfectly normal for a famous person not to write their own book, but to entrust the task to a professional who lives and breathes writing.

This approach is gradually becoming more accepted here as well, though from a marketing perspective, it still looks better if the author is perceived as the actual writer. Interestingly, it was Roman Polanski's film *The Ghost Writer* that helped bring the term into wider public awareness.

Q: How do you work, and what makes a good ghostwriter?

A: I can only really start the actual writing once I have both the first and the last sentence – but to know that last sentence, and to figure out the arc of the whole book, I have to listen to the celebrity's entire story. That often takes a month or a month and a half. The material just keeps piling up, and at first, I have no idea how I'm going to shape it. But I'm usually given complete freedom in how I put it all together. For example, Péter Tasnádi [the former underworld figure] had these incredible stories, and I felt the novel format would work perfectly for those. That book has 30 chapters, and we divided his life story into three parts. But the singer Charlie approached his project quite differently – there, the idea of 77 anecdotes symbolizing his 77 years made much more sense. To be honest, I think I'm good at this for the same reason I'm good at translating: I don't try to impose my own ego on the text. It's genuinely satisfying for me if the final result works well, whether or not my name is on the cover.

Q: When you're writing a book as a ghostwriter, is it driven more by your own interests or by the potential audience's? And do you reach out to the celebrity, or do they reach out to you – or to the publisher?

A: Usually, a book moves forward if the publisher believes there will be at least 2,000 paying customers

who buy it. That's the main criterion. But people also approach us directly. Almost everyone has a book in their drawer – lots of people think, "My life is interesting." Whether I choose to take it on is another question. For example, there was talk at one point about me writing for a politician. But I said I didn't want to write a book for an active politician. If it's someone who's retired from politics and is looking back on their life, that's fine. But a book – like any public statement – by an active politician is practically part of their next election campaign, and I don't want to be involved in that.

Q: What about celebrity autobiographies – aren't they marketing tools, too? Can they have artistic or literary value?

A: I do believe they can. Hungarian actor Ferenc Hujber, for instance, fell in love with the book I wrote for fashion designer Zoltán Herczeg – he wanted to turn it into a solo stage play, but it hasn't happened yet.

Q: Is it important for you to be able to get inside the celebrity's mindset – to identify with them?

A: I absolutely have to – it doesn't work any other way. Inevitably, I end up adding a few sentences of my own, but I can only do that if, like an actor, I'm fully in character. I need to understand what drives them.

Q: How many times do you need to meet with a celebrity for a book to take shape?

A: It depends on how much the person can handle. With Péter Tasnádi, I'd show up in the morning and we'd talk all day. For Charlie, three hours was the most he could manage at a time. In my experience, you need to record about 25 to 30 hours of material in total.

Q: What are the biggest challenges a ghostwriter faces?

A: There has to be a relationship built on trust for the collaboration to work. That's why it was a bit tricky at first with Péter Tasnádi, who came from the world of combat sports – a very masculine environment. I myself am not exactly the athletic, martial-arts type, so at first, he was a bit dismissive of me. Mind you, he's over seventy now, but still incredibly active – he plays table tennis and loves chess. At one point, I suggested we play, and once I beat him in a table tennis match and then at chess, that's when I became a person in his eyes. From then on, things started to work.



Q: Who's in charge? Do you shape the direction of the conversation with celebrities, or do you just let them tell their stories?

A: We do need to have a real conversation, at least to some extent – and I think I'm actually pretty good at that. I don't have to fake it; I'm genuinely interested in people's stories. In my experience, when a person meets someone who truly wants to understand them, it becomes much easier for them to talk about their life. And I've found that I also have to give something of myself for the other person to open up. Charlie, though – he was a tough one.

Q: How so?

A: For him, it's really all about the music – nothing else matters. It was the publisher who talked him into doing the book. But once we started working on it, he wanted to pull out, saying he didn't need this after all and didn't want to tear up old wounds. He only eased up when he saw I wasn't backing down – that I was going to do it no matter what.

Q: Does it ever happen that a celebrity wants to have a say in more than just the content of the book – for example, in the language or the structure?

A: It does happen. Take Péter Tasnádi, for example. I kept sending him the chapters as I went along, and he was happy with everything – until he read Mike Tyson's autobiography, which I had translated earlier. He told me he really liked it and asked if we could do something more like that instead. But by then, everything was already finished – I had three months of work in that text. That was a really difficult conversation. I had to make my point clear:

*The Little Prince and War and Peace both work!
There's more than one path to the top.*

In moments like that, you have to be a diplomat. You keep negotiating and reasoning until you find a solution everyone's happy with. Because if the client isn't satisfied with their own book, it never ends well.

DID YOU KNOW? LITERARY TRANSLATORS CONNECTED TO SZTE

Miklós Radnóti, one of Hungary's most prominent 20th-century poets, published a standalone volume of literary translations titled *Orpheus nyomában* (*In the Footsteps of Orpheus*). The 1943 publication gives voice, in Radnóti's native Hungarian, to two thousand years of poetry, featuring such authors as **Sappho**, **Goethe**, **Rilke**, **Apollinaire**, and **Cocteau**. The intellectual foundations for this work were laid during Radnóti's university years in Szeged, where he began his studies in 1930 and received his doctorate in the humanities in 1934.

Árpád Göncz, former President of the Republic of Hungary and the Hungarian translator of **J. R. R. Tolkien's** *The Lord of the Rings* (*A Gyűrűk Ura*), taught literary translation – both theory and practice – at JATE (a predecessor of the University of Szeged) between 1978 and 1982. At the Department of English, he was also one of the founding figures of the university's translator and interpreter training program. During this period, he published several major translations, including the Hungarian version of **William Faulkner's** *Absalom, Absalom!* (*Fiam, Absalom!*) and **E. L. Doctorow's** *Ragtime*.

Éva Dudik, who earned her degree in English and Sociology at JATE, is the Hungarian translator of several acclaimed contemporary works, including **Sally Rooney's** *Conversations with Friends* (*Baráti beszélgetések*), *Normal People* (*Normális emberek*), and *Beautiful World, Where Are You* (*Hová lettél, szép világ?*); **Emma Donoghue's** *Haven* (*Menedék*), *The Pull of the Stars* (*Hívnak a csillagok*), and *Akin* (*A rokan*); and **Celeste Ng's** *Little Fires Everywhere* (*Kis tűzek mindenütt*). She is also the Hungarian translator of the *How to Train Your Dragon* (*Igy nevelt a sárkányodát!*) book series by **Cressida Cowell**.

Róbert Illés, a graduate of the Juhász Gyula Teacher Training College's English and Hungarian program and later of SZTE's Hungarian literature program, is known for several remarkable translations – including the Hungarian version of **James Ellroy's** *White Jazz* (*Fehér Jazz*). Among his other translations is the Hungarian version of **Robert Louis Stevenson's** *The Strange Case of Dr. Jekyll and Mr. Hyde* (*Dr. Jekyll és Mr. Hyde különös esete*), along with several other classic and contemporary titles.

Gergely Nagy, who graduated in English and Ancient Greek at the University of Szeged and later taught at SZTE's Department of English for 17 years, translated several prominent contemporary works into Hungarian. These include *The Cuckoo's Calling* (*Kakukkszó*), the first installment in a crime series by **J. K. Rowling** (written under the pseudonym Robert Galbraith), and **Daniel Handler's** *Why We Broke Up* (*Hát ezért szakítottunk*).

Balázs Matolcsi, a former JATE student, is the Hungarian translator of the first two volumes of **Elena Ferrante's** *Neapolitan Novels*. These include *L'amica geniale* (*My Brilliant Friend*, *Briliáns barátinóm*) and *Storia del nuovo cognome* (*The Story of a New Name*, *Az új név története*). A translator of contemporary Italian- and Spanish-language prose, he is also actively involved in the University of Szeged's doctoral program in Italian Literature and Culture.

HOW GEOLOGY SHAPES THE PRESTIGE OF WINES

The first International Loess Terroir Conference was held at the Szekszárd Knowledge Center in Hungary, where members of the GeoTerroir Interdisciplinary Research Group from the University of Szeged's Institute of Geosciences shared insights into the scientific properties of loess-based soil, a fine-grained sedimentary deposit formed by wind. We spoke with Prof. Dr. Elemér Pál-Molnár, head of the research group, to learn more about the topic.



"Geo-terroir encompasses geographic location, topography (including slope orientation, gradient, and elevation), long-term climate trends over the past century, as well as projected future climate conditions. At the core of terroir, of course, lies the bedrock and the soil that forms upon it. The more we narrow our focus – to a vineyard or even a single plot – the more clearly we can understand the unique characteristics of that specific site. Our research group aims to communicate the scientific findings on rocks formed over geological time and the soils that have developed from them – including their properties,

features, and chemical composition – through forums like the *International Loess Terroir Conference*, primarily to inform the viticulture and winemaking community. We try to offer geological narratives. Of course, these won't make the wine itself objectively better – or worse – but they can help," emphasized Professor Elemér Pál-Molnár, head of the GeoTerroir Research Group and the Institute of Geosciences at the University of Szeged, pointing out:

"A rich scientific context can help winemakers elevate both their connection with their local community and the way they communicate with their target audience."

Geo-terroir naturally affects the entire ecosystem of a vineyard landscape, from soil biology to surrounding biodiversity. Understanding its role is also essential for strengthening the reputation and market position of wines produced in loess-based regions, including those in Hungary. In this context, the GeoTerroir Research Group at the University of Szeged seeks to build a bridge between centuries of traditional winemaking expertise and the insights offered by modern scientific research.

When we say that "tradition and taste are gaining a scientific foundation," we mean that long-standing winemaking practices and the distinctive flavor profiles characteristic of specific wine regions are no longer based solely on experiential knowledge. Instead, they are now supported by geological and soil science research, as well as geochemical analysis.

SZTE The Most Innovative University of the Year

On May 29, the University of Szeged was named University of the Year 2025 in the Innovation category at an awards gala hosted by the Ministry of Culture and Innovation. The award recognized the university's comprehensive and forward-looking approach, reflected in its ongoing pursuit and application of new solutions in education, research, and institutional practices. SZTE was also ranked among the top institutions in two additional categories: family-friendly operations, and support for culture and the arts.

SZTE WINS GRAND PRIZE IN THE MOST PRESTIGIOUS CATEGORY

"It was a great honor for us to be shortlisted in three out of nine categories – most lists included only three or four universities," said Prof. Dr. László Rovó, Rector of the University of Szeged. "What makes it even more special is that we won the grand prize in what we believe is the most important category."

The Rector emphasized that innovation is not only shaping the university's future – it already defines its present:

"The entire university was built on this idea. Albert Szent-Györgyi's Nobel Prize was made possible by the strategic foresight of Kuno Klebelsberg, Minister of Culture, whose vision ensured that a promising young researcher received all the institutional support and resources needed to thrive. And in return, that researcher exceeded all expectations and brought the highest scientific honor to the university. The biochemistry research school founded by Szent-Györgyi lives on through his intellectual successors,

including our former student Katalin Karikó, who is now a Nobel laureate and professor at our university. Inspired by this legacy, we continue to uphold the principles of innovation; all our development efforts are aligned with this vision."

"We empower our top scientists to conduct their research as efficiently as possible."

"We are proud that our international achievements attest to this fact. This very award recognizes our commitment to innovation and reaffirms that we are on the right path."

INVESTING IN THE TECHNOLOGIES OF THE FUTURE

In the Rector's view, lasting progress is grounded in real, measurable outcomes.

"Despite seemingly limited resources, we have made – and will continue to make – significant investments that will help keep the university among the most advanced

institutions," he said. "For instance, we've commissioned one of the country's most powerful computing systems, which will support our university's AI-driven research. To ensure that our innovations reach industry as quickly as possible, we've also established a dedicated technology transfer company within the university."

The Rector added that innovation is also a driving force in education, with new partnerships being formed with key industrial stakeholders.

"We recently signed an agreement with BYD and several domestic vocational training centers, with the aim of jointly establishing a high-level vehicle development center," he explained.

The Rector also highlighted recent investments in the healthcare sector:

"In the field of clinical care, we've established a state-of-the-art genetic analysis laboratory that accelerates recovery for both infants and cancer patients. We've also renewed our cardiology center, which now features a new cardiac catheterization lab. Without exaggeration, I can say that the university is a national leader in diabetology and endocrinology. In the area of surgery, our goal is to implement robotic procedures across multiple disciplines."

AGILITY AS THE KEY TO INNOVATION SUCCESS

When asked what makes the University of Szeged more successful in innovation than other higher education institutions in Hungary, the Rector highlighted a key factor:

SZTE's strategy has long been defined by an early and proactive response to emerging challenges.

"This proactive approach led to the creation of our own Center of Excellence and the development of highly efficient academic units. Today, the University of Szeged's Center of Excellence for Interdisciplinary Research, Development, and Innovation stands out as a unique institution in Hungary – uniting and actively supporting our top researchers, most promising projects, and strategic research initiatives. These achievements are the result of the university's renewal and the increased funding that came with it. Since the transition to a foundation-based model, the use of these resources has been under the university's control. That autonomy is the cornerstone of our innovation capacity," the Rector explained, summarizing the key developments that led to the university's most recent prestigious recognition.



THROUGH THE EYES OF STUDENTS

Three students represented the student community of the University of Szeged at the 2025 University of the Year Gala, where SZTE won first place in the Innovation category.



The University of Szeged continues to be celebrated both nationally and internationally as a leading center of knowledge, with consistently high placements in global rankings. What made this particular recognition especially meaningful was that students were part of the SZTE delegation alongside members of the university's leadership and representatives of the foundation overseeing the University of Szeged.

SZTE IN THE SPOTLIGHT

Kata Dudás, a second-year master's student in Hungarian Language and Literature at the Faculty of Humanities and Social Sciences, brought something special to the delegation through a combination of academic excellence, dedication, and a genuine love of folk traditions.

"I felt deeply honored to be invited, and so I accepted without hesitation. What struck me most during the gala was the warm, informal atmosphere in the way guests were treated. I hadn't known in advance that the award presentations would be accompanied by music and dance performances, so those segments were a special highlight for me."

"The most memorable moment was probably when we stepped on stage to accept the award – for a few minutes, it felt like the spotlight was entirely on our university."

"After the event, fellow students only began asking me about it once a write-up appeared on the Student Union's online platforms. As for the university's role in the event, what stood out most to me was its high level of organiza-

tion. All the practical information related to the gala was sent to us in advance, the travel arrangements were seamless, and we also received access to the photos and videos taken by the event staff," said Kata Dudás, looking back on the gala experience.

WARM AND PERSONAL ATMOSPHERE

The award ceremony was made all the more memorable by a range of colorful performances – an experience shared by Sándor Szentesi, President of the University Student Union (EHÖK). He attended in an official capacity, representing the university's more than 24,000 students.

"One of the most surprising aspects of the gala was its warm and personal atmosphere. More importantly, winning the innovation award is a significant achievement for the university, and it also highlights the significance of communicating our successes more effectively, so that students can take pride in them and become more engaged in university life."

"At SZTE, student life is genuinely active and diverse, with scientific, cultural, and community programs all contributing to the vibrant spirit that defines our university."

"Looking ahead, our goal is for the Student Union and the university leadership to work together in making decisions that serve students' interests and support the continuous improvement of the learning environment. Admittedly, it felt a little unusual at first to attend such a formal, high-profile event as the head of the Student Union – but it was also a deeply uplifting experience. I felt proud to be part of SZTE's success story. And I think this award sends a clear message: anyone who chooses to study at SZTE and shape their future here is in exactly the right place," emphasized Sándor Szentesi.

PROUD TO REPRESENT SZTE

Also seated at the University of Szeged's table during the nationally televised gala in Budapest was Máté Balogh, a first-year PhD student in the Environmental Science Doctoral School. Affiliated with the Department of Applied and Environmental Chemistry at the Faculty of Science and Informatics, Máté was personally invited by Prof. Dr. Zoltán Kónya, Vice-Rector for Science and Innovation at SZTE.

"At first, I was surprised, but also genuinely honored to have been chosen to represent the university at the gala. Later on, several fellow students told me how proud they were of the university's achievements, and some even posted about the event on social media as they watched it unfold. That sense of pride is well founded, given our university's approach."

"SZTE offers strong support for student research from the undergraduate level onward, with mentoring programs, scholarships, and real opportunities for publication."

"The alumni program is also notably active; even as students, we're encouraged to take part in SZTE Alma Mater events. There's a strong sense of community here, and plenty of opportunities for networking. All of this came into focus for me during the gala itself, which was a truly special experience. It's not often that students, professors, and university leaders celebrate together in one space on a national stage. Plus, the conversations and connections formed between students and staff from other institutions also opened the door to future collaboration. Most importantly, the event wasn't about rivalry – it felt like a collective celebration of higher education. So, the award SZTE received isn't just an external recognition; it affirms the daily work of students, instructors, and other staff alike. And for all of us, it's a motivation to stay actively engaged, whether through the student union, academic research, or cultural life," emphasized Máté Balogh.

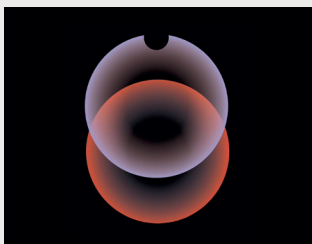


FOREVER FORWARD – KATALIN KARIKÓ

The inspiring journey of Professor Katalin Karikó, the first Hungarian woman to receive a Nobel Prize, is featured in the University of Szeged's numerous virtual, permanent, and traveling exhibitions.

NEWS

The University of Szeged news portal provides continuous coverage of the latest developments related to Katalin Karikó.



Two articles to explore:
The Birth of the JATE Award



Katalin Karikó Honored with the Mendel Award in Milan



Ilona ÚJSZÁSZ



István SAHIN-TÓTH

EXHIBITIONS

PERMANENT EXHIBITION:

The exhibition *Katalin Karikó's Journey to the Nobel Prize and Beyond* is permanently on display on the ground floor of the József Attila Study and Information Center at the University of Szeged. Featuring bilingual descriptions in Hungarian and English, the exhibition traces the milestones of Karikó's pioneering scientific career. One of its most compelling highlights is the authentic replica of the Nobel Medal awarded to Katalin Karikó for her Nobel Prize in Physiology or Medicine, presented on December 10, 2023.



CHAMBER EXHIBITIONS:

Findings from the Lab: mRNA / Karikó / HPIC

A bilingual Hungarian–English exhibition titled *Leletek a laborból – Findings from the Lab: mRNA / Karikó / HPIC* is now on view on the third floor of the University of Szeged's Institute of Biology. This exhibition highlights Katalin Karikó's years in Szeged and the research she has inspired and supported.

"A Textbook is a Book Worth Treasuring"

An additional exhibition titled *"A Textbook is a Book Worth Treasuring"* (Hungarian: *"A tankönyv is jó könyv"*), curated by the University of Szeged's Textbook Museum, features a selection of school memorabilia belonging to Nobel Laureate Katalin Karikó. It is on display in the main building of the SZTE Juhász Gyula Faculty of Education.

'SATELLITE' EXHIBITION:

An exhibition highlighting the student years of Katalin Karikó is on display in the main building of **Móricz Zsigmond High School** and its affiliated **Arany János School** in Kiszújszállás – Katalin Karikó's hometown. The exhibition was organized by the Directorate for International and Public Relations at the University of Szeged, with support from the SZTE Klebelsberg Library and Archives.

TEMPORARY EXHIBITIONS:

Travelling exhibition: Since December 2022, the University of Szeged has organized nearly twenty popular exhibitions across six Hungarian counties and in the capital. These events have featured selections from the Karikó Travelling Collection, along with artifact displays and press photography. Host cities have included Balassagyarmat, Budapest, Csongrád, Gyula, Jászberény, Kiskunfélegyháza, Kiszújszállás, Salgótarján, Szeged, Szolnok, Veszprém, and Zánka.

Portrait exhibition: To mark the occasion of Katalin Karikó's 70th birthday, a series of portrait exhibitions opened in January 2025. The displays are hosted at the University of Szeged's main building on Dugonics Square, the Szent-Györgyi Albert Agora in Szeged, and in Katalin Karikó's birthplace, Szolnok.

International travelling exhibition: The visually rich exhibition *Forever Forward – Katalin Karikó* debuted as a model project at the Josephinum Museum of the Medical University of Vienna, running from May 10 to June 28, 2025. At the same time, the Collegium Hungaricum Vienna showcased a colorful roll-up and press photo display, presented by the University of Szeged's Directorate for International and Public Relations, celebrating Professor Karikó's achievements and the symbolic imagery of scientific progress.



Katalin Karikó signing copies of her memoir
"Breaking Through: My Life in Science,"
published in 15 languages

An Academic Year of



SEPTEMBER 7, 2024

SZTE revamps its

Katalin Karikó exhibition.

Prof. Dr. Gábor Szabó: "I am convinced that in ten or fifteen years, Katalin Karikó will be part of the curriculum for English secondary school students, simply because what she has done will benefit humankind so greatly that she will be regarded in the same way as Pasteur and other prominent figures in science — a figure who deserves to be incorporated into general literacy."

NOVEMBER 9, 2024

Katalin Karikó is appointed professor at SZTE.

NOVEMBER 7, 2024

mRNA Conference starts in Szeged.



Prof. Dr.

László Rovó:

"I am confident that mRNA research will fundamentally transform medical treatment across various fields of medicine within just a few years."

NOVEMBER 18, 2024

INTERACTIVE ANATOMICAL TABLE IS COMMISSIONED AT THE FACULTY OF HEALTH SCIENCES AND SOCIAL STUDIES.

Prof. Dr. Márta Széll: "The interactive anatomical table enables students to study the anatomical structure of the human body in an incredibly realistic and detailed virtual environment unlike anything they have experienced before."

FEBRUARY 7, 2025

New utilities infrastructure and road network is unveiled at SZTE's Science Park.

Dr. Judit Fendler: "The development concept of the Science Park represented the university's first effort to go beyond its traditional scope of education, research, and healthcare. From the outset, our intention was to create an environment capable of attracting market-leading companies and fostering research innovations."



FEBRUARY 7, 2025

Project-closing conference is held for the National Laser Transmutation Laboratory project.

SEPTEMBER

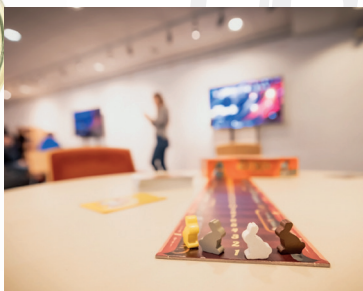
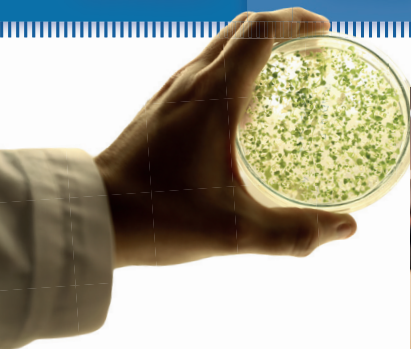
OCTOBER

NOVEMBER

DECEMBER

JANUARY

FEBRUARY



DECEMBER 9, 2024

CommuniTIK community space opens at the 20-year-old József Attila Study and Information Center.

FEBRUARY 28, 2025

Ear surgery robot is tested at the Department of Oto-Rhino-Laryngology and Head and Neck Surgery within the Albert Szent-Györgyi Clinical Center.

Success for SZTE

MARCH 1, 2025

The Albert Szent-Györgyi Clinical Center and the Partiscum Premature Infant Rescue Foundation join forces to provide rescue and transport services for premature infants across Hungary's Southern Great Plain region.

MARCH 5, 2025

SZTE and Egis establish a joint Industrial Partnership Department at the Faculty of Pharmacy.

Prof. Dr. László Rovó: "The concept of an industrial partnership department is closely linked to the idea of an innovation ecosystem model in terms of which the University of Szeged, as a fourth-generation university, defines its mission."

MARCH 25, 2025

Upgraded Cardiac Catheterization Lab opens at the SZTE Cardiology Center.

Prof. Dr. László Rovó: "The transition to the new foundation-based model has granted us access to additional financial resources that enable us to realize such projects."

MAY 6, 2025

SZTE and MSD Pharma Hungary Kft. establish a joint Industrial Partnership Department.

MAY 12, 2025

SZTE officially opens its Host-Pathogen Interaction Center, established with the support of Nobel laureate biochemist Katalin Karikó.

Prof. Dr. Katalin Karikó: "I'm delighted to inaugurate this remarkable center in the company of my former professors and fellow students. I had a chance to look around – it's truly impressive, and I hope it will contribute to science through countless valuable experiences, insights, and discoveries."

MAY 15, 2025

The establishment of the Central Sequencing Laboratory and the Ormos Jenő Molecular Pathology Diagnostic Center is completed, supported by nearly half a billion forints in funding.

Dr. Judit Fendler: "The University of Szeged intends to invest both its prospective EU funds and internal resources in cutting-edge technologies."

JULY 1, 2025

The Institute of Geosciences at the Faculty of Science and Informatics of the University of Szeged undergoes major infrastructure development aimed at strengthening the synergy between education and research.

JULY 8, 2025

SZTE's 1.75-petaflop supercomputer is unveiled, providing computing capacity for AI-based research, with professional support from the University's Artificial Intelligence Competence Center, operating within the Center of Excellence for Interdisciplinary

Research, Development, and Innovation.

JULY 10, 2025

Extensive renovations at several units get underway at the Pediatric Clinic, with completion scheduled for the first half of 2026.



MARCH

APRIL

MAY

JUNE

JULY

MARCH 29, 2025

Bálint Sándor Well-being Program is launched in the town of Ruzsa.

Dr. Judit Fendler: "The University of Szeged is committed to using its knowledge and resources for the benefit of society."

APRIL 8, 2025

Foundation stone is laid for SZTE's Regional Cyclotron and Radiopharmaceutical Supply Center.

Dr. Judit Fendler: "This equipment opens up tremendous opportunities in pharmacy and medical education. It will also lead to significant improvements in the efficiency of healthcare."

JUNE 17, 2025

The TALENT Pro Bono Scholarship is launched through the collaboration of the SZTE Junior Academy and the SZTE Directorate-General for Strategy and Development, with the aim of appropriately recognizing university students who, alongside their studies, contribute to the community through volunteer work.





Ferenc LÉVAI




István SAHIN-TÓTH

Medical Marvel:

Eleven-year-old Boy Receives World's First Smart Cochlear Implant



On June 25, 2025, surgeons at the Department of Oto-Rhino-Laryngology and Head and Neck Surgery at SZTE's Albert Szent-Györgyi Clinical Center implanted the world's first smart cochlear device – the latest innovation in high-end hearing technology, only recently introduced on the global stage. The recipient was an eleven-year-old boy named Loránd, who had been gradually losing his hearing despite the use of a hearing aid. The new device offers him a renewed chance to experience natural hearing.



Thanks to his traditional hearing aid, eleven-year-old Loránd – known to his family and friends as Lóri – was able to learn to speak alongside his peers. However, as his hearing continued to deteriorate, it became increasingly difficult for him to follow lessons at school or understand his parents and friends. Faced with these growing challenges, the family chose a solution they already knew well – the cochlear implant, a technology they had first encountered a few years earlier when Lóri's younger brother received one for his severe hearing loss.

Encouraged by how well it had worked before, the family felt confident choosing the cochlear implant once again.

It was this family decision that led to the carefully prepared, state-of-the-art procedure carried out by the Szeged Hearing Improvement and Implantation Working Group, led by Prof. Dr. László Rovó. In this context, it is worth noting that the Szeged team has also tested the RobO-tol surgical robot in similar operations.

The Nucleus® Nexa™ Implant builds on Cochlear Limited's more than four decades of experience with reliable implant systems and its leading role in technological innovation – ushering in a new era in cochlear implantation. It is the first implant capable of continuous self-monitoring to optimize safety and performance, and its firmware can be updated over time, making future innovations accessible to patients. Notably, the device enhances usability and all-day battery life through dynamic power management and offers a seamless hearing experience with the world's smallest and lightest sound processor.

"This device represents a true milestone in medical technology. The difference compared to earlier devices is like that between a push-button phone and a touchscreen smartphone," said Prof. Dr. László Rovó, the ear, nose, and throat specialist who performed the procedure and currently serves as Rector of the University of Szeged.

After rehabilitation and device calibration following the surgery, Lóri may soon enjoy what could be described as:

An almost perfect hearing experience

All of this may be achieved within a few months – just in time for Lóri to return to his acrobatic rock and roll training and dive back into his studies.





Imre VIDA-SZÚCS

Ádám KOVÁCS-JERNEY

BABY WITH ABDOMINAL WALL DEFECT SAVED AT SZTE'S PEDIATRIC CLINIC

Doctors at the Pediatric Clinic of the University of Szeged have saved the life of a baby girl from Transylvania, Romania, who was born with a rare congenital condition: an open abdominal wall. The complex two-stage surgical procedure was performed by Dr. Tamás Kovács, Assistant Professor at SZTE, who emphasized that the success of the operation was made possible by well-coordinated teamwork.

*Reunited as a family
in the surgical ward
of the Department
of Pediatrics
at SZTE's
Albert Szent-Györgyi
Clinical Center*





A young couple from Romania reached out to Dr. Tamás Kovács, Head of the Surgical Unit at SZTE's Department of Pediatrics and Pediatric Health Center, in hopes of saving their unborn baby – their first child, Abigél, who had been diagnosed with a rare developmental disorder.

"We came from Sfântu Gheorghe. It was back in November last year when we learned that our unborn baby had an open abdominal wall," said Brigitta Rácz, Abigél's mother. "In Transylvania, they told us surgery wouldn't be possible – that our baby had only a 50 percent chance of survival. However, while searching online, I discovered a pediatric surgeon in Szeged."

The congenital condition known as an open abdominal wall means that the abdominal organs develop outside the abdominal cavity while the baby is still in the womb, leaving them exposed at birth to the external environment.

"Only one or two such cases are treated each year in the Southern Great Plain region," said Dr. Tamás Kovács.

According to the assistant professor, the success of such procedures depends on several critical factors:

the surgical unit's decades of experience in neonatal surgery; close cooperation with the Department of Obstetrics and Gynecology and its specialists; and the high-level expertise of both the anesthesiology team and the neonatal intensive care unit. In short:

The key to success was genuine teamwork.

"This developmental disorder can be corrected in two stages. We scheduled the Cesarean section for the 38th week of pregnancy, after which the newborn underwent emergency surgery. One week later, on April 17 – Holy Thursday – the second operation was performed. After that, the baby remained sedated in the neonatal intensive care unit. Fortunately, Abigél's recovery went smoothly," noted Dr. Tamás Kovács, speaking more than two weeks after the procedure. According to the doctor, the little girl suffered no permanent damage and is expected to live a full and healthy life. Abigél's parents were deeply satisfied with the care they received in Szeged. They are now planning to relocate to Hungary.

AI-OPTIMIZED SUPERCOMPUTER NOW OPERATIONAL AT SZTE

The University of Szeged has commissioned a supercomputer with a capacity of 1.75 petaflops. Developed with the professional support of the Artificial Intelligence Competence Center at the university's Center of Excellence for Interdisciplinary Research, Development, and Innovation (IKIKK), the system provides computing power for SZTE research projects involving artificial intelligence.

Recognizing the growing data demands of cutting-edge research, the University of Szeged established dedicated AI computing capacity to better support projects utilizing artificial intelligence. The new infrastructure supports, among others, Prof. Dr. Antal Berényi's research in neurocybernetics; cochlear implant development led by Prof. Dr. László Rovó; the mathematical modeling of ep-

idemic dynamics by Dr. Gergely Röst; and Prof. Dr. Márk Jelasity's investigations into the vulnerabilities and internal knowledge representations of large language models.

The AI-optimized supercomputer will also play a key role in genomics research, enabling the analysis of a complete human genome in hours rather than days. Beyond genomics, it will support pharmaceutical

From left to right: András Újhegyi, CEO of SZTE TTC Zrt.; Gábor Tóth, Managing Director of PC Trade Systems; Prof. Dr. László Rovó, Rector of the University of Szeged; Prof. Dr. László Palkovics, Government Commissioner for Artificial Intelligence; László Bódis, Deputy State Secretary for Innovation; Dr. Judit Fendler, Chancellor of the University of Szeged; Tibor Szpisják, Managing Director at Hewlett Packard Enterprise; Prof. Dr. Márk Jelasity, Head of the Competence Center For Artificial Intelligence at SZTE IKIKK; and Csaba Fekete, Director of IT and Services at SZTE.





development by enabling simulations of molecular behavior that can accelerate the design of targeted therapies. Additionally, the system is expected to make significant contributions to research in physics and materials science – for example, by efficiently running simulations of novel material structures.

EXPERT SUPPORT

On a practical level, the Artificial Intelligence Competence Center at IKIKK has made its resources available to research groups pursuing AI-driven projects.

The Center offers both expert guidance on AI-specific research questions and access to dedicated computing time.

According to Professor Dr. Márk Jelasity, head of the Competence Center, their goal is to support the development of AI-related ideas and initiatives within the University of Szeged through tailored expertise and infrastructure. “This might mean simply recommending methodologies for how researchers can work with their data – or it may involve taking on specific tasks and participating directly in the implementation of a project,” he says. Prof. Dr. Zoltán Kónya, Vice-Rector for Science and Innovation at the University of Szeged and Head of IKIKK, notes that the new supercomputer will also be used to support the university’s internal oper-

ations through artificial intelligence. For instance, an AI assistant could handle 90–95 percent of student inquiries, while similar gains in efficiency could be achieved in routine clinical patient management workflows. Professor Kónya adds that every university project can be examined to identify how its processes might benefit from the use of AI.

STATE-OF-THE-ART TECHNOLOGY

The operation of the supercomputer, developed by Hewlett Packard Enterprise, along with its integration into the university’s IT infrastructure, is managed by the Directorate for IT and Services at the University of Szeged. The unit is led by Director Csaba Fekete, who played a key role in both the preparation and implementation of the project. As he emphasizes: “We have deployed world-class technology that enables us to contribute to leading global academic research and AI development. However, operating the supercomputer presents several new technical challenges – one of the most critical being energy consumption and efficiency. In practical terms, the system requires 26 kWh of electricity for operation, plus an additional 14 kWh for cooling. From a sustainability perspective, it is particularly significant that such high performance is achieved with relatively low energy use, thanks to the integration of cutting-edge, next-generation technologies.”





WEAPON-FILLED GRAVE REVEALED TO HOLD A WOMAN'S REMAINS

Researchers at the University of Szeged have made an unprecedented discovery related to the era of the Hungarian Conquest in the Carpathian Basin by analyzing human remains in a weapon-filled grave and identifying them as belonging to a woman. To delve deeper into this remarkable revelation, we spoke with Dr. Balázs Tihanyi, a research fellow at the university's Department of Biological Anthropology and Department of Genetics, and the lead author of the study that brings these findings to light.

Q: What methods were used to determine that the remains in Grave 63, excavated at the Sárrétudvari–Hízóföld archaeological site in eastern Hungary, were those of a woman rather than a man?

A: As part of our research, we identified the individual's biological sex by conducting both anthropological and archaeogenetic analyses on the remains.

Q: Prior to any thorough analyses, did the original excavators suspect that the individual might have been a female warrior – based on the items buried in the grave?

A: When the grave was excavated between 1983 and 1985, one of the most striking finds within it was a set of archery equipment. Because weapons and archery equipment are typically associated with men, the individual was initially identified as male. On top of that, the deteriorated condition

of the bones limited the scope of anthropological analysis, while the presence of weapons strongly reinforced the belief that the remains belonged to a man. However, the grave also contained a necklace, an item typically associated with female burials. That said, beads have also been found in 10th-century male graves. Considering all these factors, researchers concluded that the individual was most likely a man who had been buried with beads.

Q: How did the possibility arise that the person might not have been male?

A: The first doubts emerged around 2017-2018, when my colleague William Berthon and I, both doctoral students at the time, began analyzing the anthropological remains from the Sárrétudvari cemetery. As part of this process, he revisited the data on sex and age, using methods that primarily focus on



Helga BALOG

Ádám KOVÁCS-JERNEY

examining pelvic bones – methods that had not been available for earlier studies. When we re-examined the bones, it became increasingly clear that the individual's sex might not be as easily determined as previously assumed. However, despite applying these newer anthropological methods, the poor condition of the bones made it impossible to reach a definitive conclusion.

Q: The next step was to determine whether the individual had really been a warrior. While the placement of the weapons suggested this, certain factors raised doubts. What in particular called this assumption into question?

A: When weapons are found in a grave, they're often interpreted as evidence that the individual was a warrior or soldier. However, I approach this classification with caution, because labeling someone as a warrior involves a very specific and complex concept. A warrior, armed with weapons – that is not only a legal and social category but also one that's difficult to assess using archaeological methods alone. Previous research, primarily based on anthropological and archaeological methods, also calls for caution, highlighting that the presence or absence of weapons in a burial site does not necessarily provide a clear indication of the individual's occupation or social status, at least not in the way we might define them today.

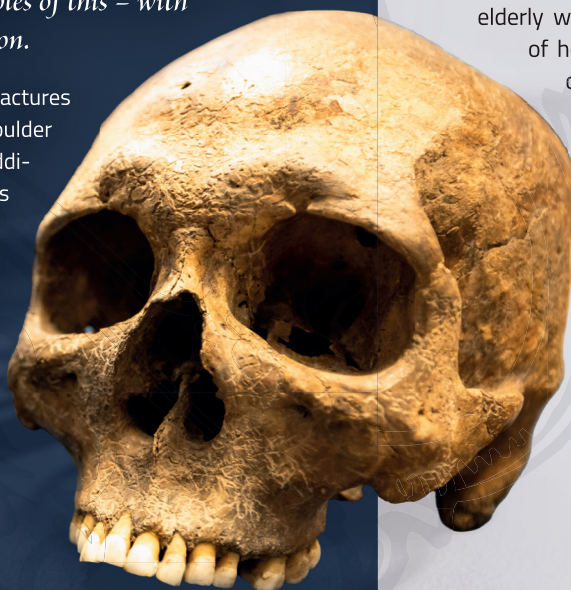
For example, there have been burials – not only in Hungary but abroad as well – where weapons were placed in graves despite the fact that the deceased could not have used them, either because they were too young or too ill. The inclusion of weapons could symbolize social status or be part of a burial custom. However, this doesn't automatically mean the individual fought or lived as a warrior.

Q: The injuries found on the woman's bones were also examined. What conclusions were drawn about her lifestyle?

A: Previous studies focusing on injuries in the Hízföld cemetery show that fractures were far more common among men than among women, especially men buried with weapons or horse gear.

For women, bone fractures were extremely rare. In fact, we found few examples of this – with this case being an exception.

For this particular individual, fractures were identified on both shoulder blades and upper arm bones. Additionally, the distribution patterns of muscle attachment and joint changes observed on her skeleton resembled those typically seen in men.



FACING THE PAST

At the forefront of anthropological innovation, Dr. Luca Kis, a researcher at the Department of Anthropology of the University of Szeged's Institute of Biology, is reviving the visages of ancient individuals through cutting-edge digital reconstruction – an expertise she alone practices in Hungary. As the illustrator for the study led by Dr. Balázs Tihanyi – featuring a woman buried with weapons – Dr. Luca Kis shared with us some intriguing insights into her extraordinary work.

Q: You created the illustration for the woman buried with weapons, featured in Dr. Tihanyi's study. What sources of data informed your depiction?

A: In this particular case, there wasn't enough physical evidence to allow for a full facial reconstruction, so I created an archaeological illustration instead. Even with illustrations, the goal is to depict the burial scene as authentically as possible. To do that, I rely not only on anthropological findings but also on archaeological and historical sources. From the available data, we knew the individual was an elderly woman, and I based my depiction of her posture and the placement of objects on the original excavation sketch – drawn to scale on graph paper by archaeologists at the site. However, since organic materials rarely survive in the soil of the Carpathian Basin, we had very limited information about her clothing; thus, we referenced historical illustrations and archaeological comparisons.



To better understand how fabrics might have folded on the body, we even asked a colleague to lie in the same burial position while draped in different textiles.

Q: When you reconstruct a face, how accurately does it reflect what the person really looked like?

A: Naturally, some facial features will always remain uncertain, but we can often capture the essence of a person – their unique facial character. In practice, facial reconstruction has two main applications: museum exhibitions and forensic identification. In forensic cases, when an investigation reaches a dead end, a reconstructed face might trigger recognition in a relative or friend.

Q: Could you walk us through the reconstruction process? Which aspects do you handle personally, and at what

point do other specialists contribute their expertise?

A: The reconstruction process begins with a comprehensive anthropological assessment, which involves several steps. First, I determine the individual's biological sex and estimate their age at death. As a crucial next step, I assess which major ancestral population group the individual likely belonged to, based on craniofacial characteristics. This information is essential throughout the process, for instance when selecting the databases and methods to use. Naturally, the most reliable results come from using a method developed or tested on a population of similar origin, as variables such as average soft tissue depth are known to vary with sex, age, and ancestral background.

I also conduct a paleopathological assessment to identify any diseases or congenital conditions that may have altered the facial structure – such as leprosy or a cleft palate. Once that's complete, the

actual reconstruction process begins with the digitization of the skull and any other relevant skeletal elements. I then rely on input from archaeologists, historians, and geneticists. Archaeologists provide insights based on grave goods and burial context to guide my depiction of clothing. When such evidence is lacking, I consult the works of historians who have documented the typical attire of the period and region. Finally, geneticists contribute information on probable eye color, hair color, and skin tone.

Q: What's the actual process of creating a facial reconstruction?

A: I work digitally, sculpting on a tablet much like a traditional sculptor. I use several advanced 3D modeling programs.

One of the software tools I rely on is the same one used to bring the iconic dragons of Game of Thrones to life.

Adapting these entertainment-industry tools to scientific reconstruction was a major challenge – and it took years of experimentation and practice to master them. Since these programs weren't built for anthropological work, I had to develop my own workflows – adapting established forensic and archaeological methods to a digital environment originally designed for animating fantasy creatures. But I have access to dozens of customizable sculpting brushes, with size and pressure dynamically responding to the angle and force of my stylus on the screen.

GO, SZTE-SZEDEÁK!

UNIVERSITY BASKETBALL TEAM KICKS OFF FALL SEASON WITH NEW PROJECTS AND FRESH MOMENTUM

With an impressive late-season surge, the SZTE-Szedeák men's basketball team secured its place in Hungary's top division by the end of last season. Now, the team is launching into the new season with official training academy status and a renewed set of professional programs. Its close cooperation with the University of Szeged is opening up new horizons not only in terms of championship achievements, but also in nurturing future athletes and supporting education.

Last year, the SZTE-Szedeák team earned a silver medal in the final of the Zsíros Tibor Hungarian Cup and finished 11th in the league for the second consecutive season. Over the summer, the team – including several students from the University of Szeged – also had to integrate six new players into its first-division lineup. Among them was SZTE student Botond Cseh, who delivered an outstanding performance – until he fractured his cheekbone during the first home game of the relegation round, against the Budapest Honvéd team. “All in all, it was a rollercoaster of a season. But by the end, we were able to play some high-quality basketball – and that’s what secured our place in the league,” he said.

At a season-closing press conference in June, Dr. Péter Kardos, President of SZTE-Szedeák, announced some exciting news:

SZTE-Szedeák’s men’s division has been granted official training academy status.

This distinction was conferred by the Hungarian Basketball Federation following a recommendation from its executive board. The title recognizes the exceptional quality of the team’s training program – an achievement made possible not only by the University of Szeged’s role as naming sponsor, but also through its close collaboration with the team.

The collaboration continues on several fronts. One example is the deepening partnership with the Insti-

tute of Physical Education and Sports Science at the SZTE Juhász Gyula Faculty of Education: beyond serving as a training site for future coaches, Szedeák is now also involved in research projects and data analysis. In addition, the marketing and communications program launched in cooperation with a student group from the Faculty of Economics and Business Administration will resume this autumn, as will the collaboration with the SZTE Junior Academy, which supports young players through scholarship opportunities.

With these strengthened partnerships and renewed foundations, the SZTE-Szedeák team is entering the new season with fresh projects and strong momentum.

“It’s still too early to make predictions, but we definitely want to achieve better results,” said Botond Cseh. “The summer gave everyone the chance to focus on individual improvement, and as a team, we want to perform more steadily throughout the season.”



Sára BISZTRICZKI

Ádám KOVÁCS-JERNEY



Beyond the Lab:

Edit Nagy's Virtual Mood Journal

By day, they teach university students, search for cures for incurable diseases, and dream up inventions. But how do instructors and researchers at the University of Szeged spend their free time? We spoke with Dr. habil. Edit Nagy, physiotherapist and college professor at the Faculty of Health Sciences and Social Studies (ETSZK), at her photo exhibition titled "*Shades of the Soul*."



Ilona ÚJSZÁSZI



Karina BARTHA

Q: Graduating in physiotherapy at the University of Szeged, you've dedicated your professional life to healing through natural energy. Today, as a college professor, you teach and conduct research in the science of physiotherapy and lead international courses. You've worked at the university for over thirty years. What kind of knowledge do you aim to pass on to your students?

A: "Life is movement, and movement is life," as the saying goes. Movement plays a vital role in both preserving and restoring health. My area of specialization is the treatment of central nervous system injuries. As a member of IBITA – the International Bobath Instructors Training Association – I follow a globally recognized standard. In addition to my publications on posture, balance, and their neurophysiological background, new areas have recently entered my research focus as well: the experience of pain and the effects of weather on the autonomic nervous system.

Q: You have over 200 publications listed in the Hungarian Scientific Bibliography Database (MTMT). How did photographs find their way into that list?

A: I wanted to understand how to use my camera properly, so I enrolled in the applied photography program at the University of Szeged's Juhász Gyula Faculty of Education. The qualification I earned there has since become part of my family business and my work as a physiotherapist. I also use my photos to illustrate educational materials. Thirty-four of my photographs, which have been published in print and in photo albums, received the designation of 'artwork,' making them eligible for inclusion in the MTMT database. I'm also a member of naturArt, the Association of Hungarian Nature Photographers.

In nature photography, the ethics are clear: you're not allowed to add or take away from the moment you've captured. But from my raw images, I can unfold a version that expresses a particular feeling or mood. So, I often spend many hours working on a single photograph.

Q: In your exhibition "Shades of the Soul," your photographs make a strong case for photography as a form of fine art. As someone devoted

to movement, how did you become a creator of still images – a photographic artist?

A: I see myself as an observer in this world. Photography, for me, is a form of self-expression – a way to capture emotions and states of mind. I associate each photo with a particular mood. I also try to express that feeling through the image's title, or sometimes through music. I often share this interplay of impressions – this kind of emotional composition – on my social media space. That's what I call my *virtual mood diary*.


"The Silver Box" – Dr. habil. Edit Nagy's favorite photograph – reflects her boundary-pushing approach, which comes close to redefining photography as fine art.



EZÉST DOBOZ AZ ORION ALATT
SILVER BOX UNDER THE ORION

Geothermal Energy: From Earth's Depths to Warm Homes

The University of Szeged is one of the few institutions in Hungary that incorporates geothermal energy into its heating system. In this feature, with insights from SZTE-trained experts, we explore how thermal energy makes its way from 2,000 meters below the surface to heat buildings in the city.



Across Szeged, more and more unusual structures are appearing – purpose-built to tap into the Earth’s internal heat by extracting the thermal water that carries it. But how do engineers and geologists decide where to drill? That’s where the expertise of professionals like Tamás Ézsiás comes in. A geologist who earned his degree at the University of Szeged, Ézsiás now works at Geo Hőterm Kft., a limited liability company where he is responsible for the development, operation, and maintenance of the city’s geothermal wells. These wells reach depths of around 2,000 meters, where water heated to nearly 100 degrees Celsius can be found.

“There are three fundamental pillars when it comes to establishing thermal wells: geological, technological, and social,” explains Tamás Ézsiás. “*Geologically*, first, there must be a reservoir rock – which we have beneath Szeged in a sandstone formation. Secondly, that rock must be saturated with some type of fluid – in our case, thermal water. Thirdly, the entire formation must lie at a depth where the surrounding environment is hot enough to transfer sufficient heat to the fluid, allowing it to store thermal energy. The *technological* pillar involves bringing that fluid to the surface in an economically viable way. And finally, there’s the *social* pillar: it doesn’t matter how much energy we extract if there’s no infrastructure above ground to receive and use it – what we need is a viable heat market.”

That heat market typically refers to a city and its district heating system.

If the geologists’ calculations are correct and the drilling is successful, thermal water can reach the surface from several kilometers underground. But

for its warmth to actually reach homes and institutions, one more essential link is needed: the heating plant, which connects the geothermal source to the existing district heating system. This step is more complex than it may seem – integrating thermal energy into a conventional heating network is far from straightforward.

“Many components of the geothermal system incorporate improvements that took years of work to realize,” explains Dr. Gábor Bozsó (pictured), Technical Director at the municipal district heating company Szegedi Távfűtő Kft. and Deputy Director of the Institute of Geography and Geosciences at the University of Szeged.

“The thermal water – consistently around 90 degrees Celsius – is perfectly capable of meeting demand on its own. However, as outside temperatures drop, the energy coming from the well alone is no longer sufficient. At that point, the gas-powered system also needs to be activated. That’s why mild weather gets mentioned so often in this context.”

“Mild weather is the best in terms of geothermal use – because it allows us to utilize the extracted energy to its fullest extent.”

What Do Animal Symbols Reveal About Us?



That is the central question explored by the Animalia Research Center at the University of Szeged's Faculty of Humanities and Social Sciences. The Center is led by Dr. Éva Vígh (pictured right), Professor Emerita of the Department of Italian Studies, and its secretary is Dr. habil. Edit Újvári (left), Head of the Department of Cultural Studies at the Juhász Gyula Faculty of Education – both alumnae of SZTE's predecessor, József Attila University. Together, they investigate how animal symbols shape our identity, relationships, and self-image. In 2025, their work was the focus of an intriguing discussion during Hungarian Book Week, moderated by Dr. Anna Kérchy (center), Full Professor at SZTE's Department of English Studies.

The Animalia Research Center brings together interdisciplinary research on *humanitas* and *animalitas* – exploring the complex ways in which humans are zoomorphized, animals are anthropomorphized, and how these representations relate to broader questions of animal symbolism. In response to growing interest in the field and a desire to share their findings more widely, the center launched the Animalia eBooks series in 2024, presenting a summary of their work to date.

The lead researchers are also associated with authoritative reference works, such as the volume *Animal Symbol Encyclopedia* (*Állatszimbólumtár*), edited by Éva Vígh, with Edit Újvári playing a major role in writing the entries. The book explores the symbolic meanings of 122 real and mythical animals – from A to Z – tracing how these meanings have developed and transformed across time and cultures.

The volume also devotes special attention to fantastical creatures that appear in literature and film, such as werewolves and vampires. In this context, the authors emphasize that humans have long created imaginary monsters and hybrid beings because such figures – existing at the boundary between human and animal – help express our fears, desires, and relationship with the unknown. These depictions embody the blurring of boundaries, giving form to what lies beyond conventional norms.

According to the studies included in the *Animal Symbol Encyclopedia*, the hybrid creatures of fantasy act as cultural mirrors: they carry symbolic meaning and reflect how we perceive ourselves and the world around us.

Interestingly, hybrid creatures also appear in contemporary young adult literature. As Éva Vígh explains, the hippogriff featured in J.K. Rowling's world-famous *Harry Potter* series was inspired by Ludovico Ariosto, the greatest writer of chivalric epics in the 16th century. The hippogriff in *Harry Potter* can be traced back to the mythical creature in Ariosto's *Orlando Furioso* – a beast with the head and wings of an eagle and the body of a horse. "It's fascinating to see how a literary figure born 400 years ago reappears in one of the most iconic stories of the 20th century,"

Professor Vígh says.

SZTE HOSTS FIRST FAMILY PICNIC AT ITS BOTANICAL GARDEN

The University of Szeged hosted its first-ever Family Day at the Botanical Garden, which proved to be an ideal setting for the event. Staff members from the Institute of Plant Biology at the HUN-REN Szeged Biological Research Center also took part in large numbers as exhibitors, contributing significantly to the day's success. This event is a clear indication of the University's commitment to fostering a supportive and engaging environment for its employees – something especially important given its role as the region's largest employer.

"Being a Family-Friendly University means embedding our commitment to the mental and physical well-being of our employees into every aspect of our operations. We aim to support their mental and physical health, help them achieve success and pursue their ambitions, and to strengthen family bonds and relationships," said Dr. Andrea Saághy, Director of Human Resources at the University of Szeged. "This approach is brought to life through a wide variety of opportunities, benefits, support services, and dedicated programs."

The vibrant springtime family fair offered an unforgettable experience for all generations, filled with interactive activities, lively sports demonstrations, and playful team challenges. Throughout the day, children had the opportunity to explore a rich variety of activities, from a musical performance and a whimsical bubble show to arts and crafts, face painting, and pop-up games – all capped off by an enchanting puppet show. For a more relaxed experience, those seeking a quieter moment could unwind by the pond and listen to five captivating stories read aloud. In addition to the children's programs, visitors had the chance to explore the Botanical Garden's stunning array of plants. The event also included two science outreach programs – *Plant Day* and the *Biologists' Meet-Up* – both of which featured a range of engaging exhibitions and educational activities.



Ferenc LÉVAI



Ádám KOVÁCS-JERNEY

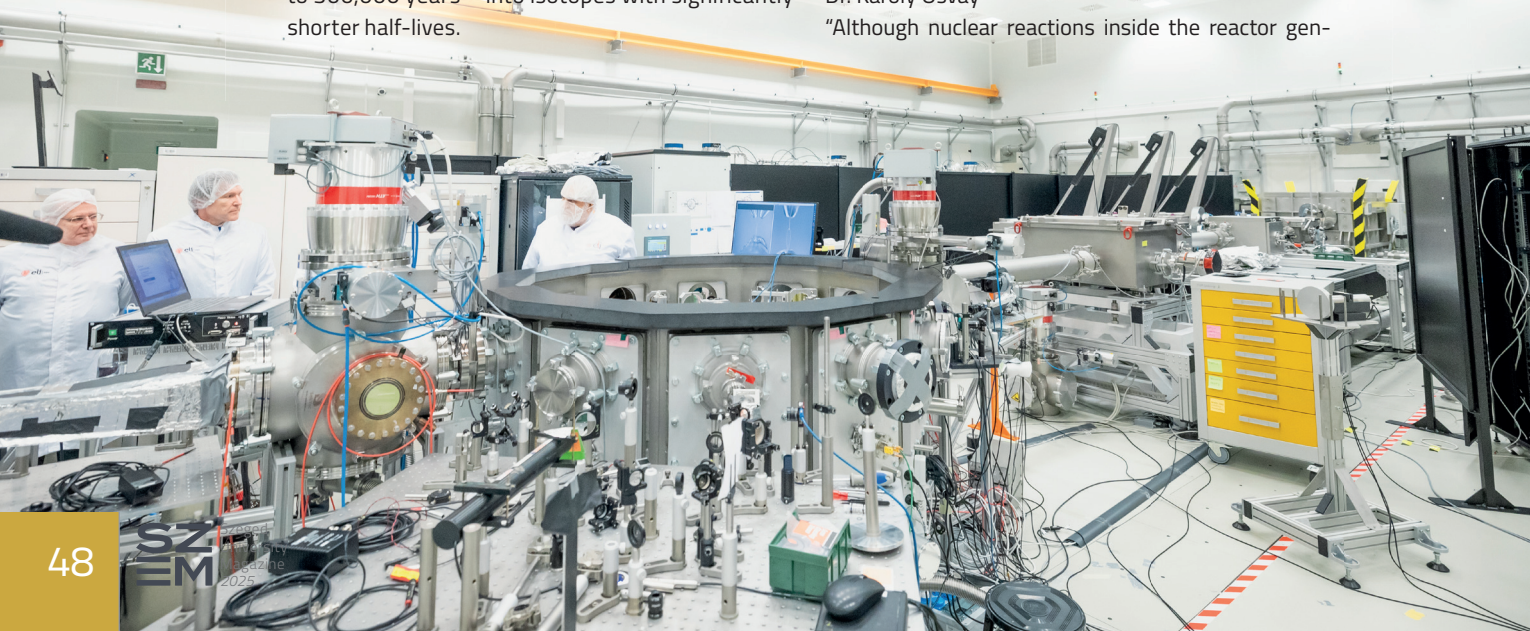
New Frontiers: Laser-Driven Neutron Generation in Biomedical Research

The National Laser-Initiated Transmutation Laboratory at the University of Szeged, led by laser physicist Dr. Károly Osvay and supported by his research team, has achieved a global breakthrough by demonstrating that neutron generation is feasible using a low-energy, short-pulse laser. Over the past five years, the team has set a world record by generating 10^8 neutrons per second during several hours of daily operation – a feat made possible through meticulous scientific and technical innovation. Their neutron-generation beam-line is now included in the ELI ERIC user program, where further research has already begun in the field of medical isotope production. At our request, Dr. Károly Osvay summarized the results of this pioneering laser-induced transmutation research.

The core principle behind the transmutation process is that, by harnessing a suitable neutron source, it is possible to develop a mechanism that transforms long-lived isotopes found in spent fuel – with a radiation time between 200,000 to 300,000 years – into isotopes with significantly shorter half-lives.

“According to one approach proposed by researchers working on transmutation, long-lived isotopes could be processed in what’s known as a subcritical reactor – one that relies on an external neutron source and functions only while that source is active,” explained Dr. Károly Osvay

“Although nuclear reactions inside the reactor gen-



erate a substantial number of neutrons, they are not sufficient to sustain the chain reaction on their own.” This makes subcritical reactors inherently safer.

Subcritical reactors cannot enter a runaway state: if the neutron source is absent for just five minutes, the entire system shuts down.

However, as Professor Osvay pointed out, this also underscores the core challenge: such reactors demand an external neutron source that is inherently stable, since even brief interruptions are unacceptable in industrial applications.

LASER-DRIVEN NEUTRON BEAMS

Nobel-laureate physicist Gérard Mourou – now a research professor at the University of Szeged and a close follower of Professor Osvay’s transmutation experiments – together with plasma physicist Professor Toshiki Tajima, proposed a novel laser-based approach to neutron generation to the research team in Szeged. Currently, external neutron sources can be provided by linear accelerators, but these accelerators experience shutdowns lasting more than five minutes every one or two weeks. Professor Osvay believes laser-based neutron generation could eliminate this problem entirely. With a sufficient number of lasers operating in parallel, there is a level of reliability that meets both industrial and economic demands. That’s why, five years ago, the transmutation research group at the University of Szeged set out to develop a stable, laser-based neutron source of their own.

“Since the 1980s, scientists have known that neutrons can be generated using ultra-high-power lasers – systems capable of firing a pulse only once per hour, or even less frequently,” explained Dr. Károly Osvay. “However, from an industrial standpoint, what’s needed is a laser that can deliver 10, 100, or even 1,000 pulses per second. These high-repetition-rate lasers operate at much lower energy per pulse compared to the massive systems developed decades ago. That’s why, in the first phase of our experimental program, we focused on investigating whether the ELI lasers – despite their lower pulse energy but extremely short pulse durations – could still accel-



erate particles effectively, and whether those particles could, in turn, be used to generate neutrons.”

Professor Osvay went on to explain the underlying mechanism:

“The principle of laser-driven neutron generation works as follows: the laser beam is focused onto a target – typically a thin foil – producing a plasma. The laser itself is a form of light, an electromagnetic wave, which interacts with the charged particles in the plasma. Over a distance of just a few dozen micrometers, it can accelerate these particles to high energies. The charged particles that emerge from the first target then strike a second target, where – depending on their energy – they can trigger nuclear reactions. This is how neutrons are produced.”

A WORLD-RECORD NEUTRON COUNT

As Professor Osvay pointed out, stability is not the only critical limitation of this setup; its overall efficiency also remains a key concern.

“We had no prior data on how efficient short-pulse lasers could be for particle acceleration,” he recalled, reflecting on the early days of their research program. “No experiments had been carried out with lasers as short-pulsed as those available at ELI. Initially, many in the field even doubted whether such low-energy lasers could achieve any meaningful acceleration at all. But we proved that it was possible – and through a carefully designed series of experiments, we systematically mapped the underlying physics, eventually reaching the point of neutron gener-



ation. At first, we produced only a few hundred neutrons per laser shot per second. Over time, this yield was gradually increased to over a thousand and eventually to over ten thousand. Ultimately, we achieved not only tens of thousands of neutrons per shot but also significantly increased the total number of shots. By December 2023, we reached 1,000 shots per second – a rate we were able to sustain only for one or two minutes at the time. Nonetheless, it allowed us to achieve a yield of 10^8 neutrons per second. That result, in itself, can be considered a world record. Building on this breakthrough – and thanks to continued scientific and technical advancements we managed to make – we were able to sustain a stable neutron source for several hours at a time by the end of 2024.”

ACHIEVING STABLE NEUTRON PRODUCTION REQUIRED A SERIES OF TECHNICAL INNOVATIONS:

“While accelerating particles with lasers, plasma is generated. In 2023, we developed a liquid jet target by directing two opposing liquid jets at each other, forming a thin liquid film in the plane where they intersect. This film serves as our target. The entire setup is compact, with the liquid film measuring about 1.5 mm in height and just under 1 mm in width, shaped somewhat like a spear – though some liken it to a heart. Importantly, the liquid target must be inside a vacuum chamber. However, a key challenge arises when the liquid enters a vacuum, as it immediately boils and evaporates, disrupting the vacuum and causing heat loss, which can lead to freezing. To prevent this, the liquid must be kept flowing – but the dynamics of the liquid jet are highly sensitive; even minor vibrations in the lab can cause it to become unstable. Despite these challenges, in the summer of 2023, we carried out our first experiment in which we successfully fired continuously at 10 Hz – an achievement that, at the time, marked a significant milestone. When we increased the repetition frequency to 1,000 Hz later

in 2023, we encountered instability that had not been present at 10 Hz. The liquid film became unstable and froze within minutes. Fortunately, we were able to make significant adjustments to maintain the liquid film’s stability and since the fall of 2024, we have been able to keep it within plus or minus one and a half degrees at any repetition frequency. We are particularly proud of this breakthrough.”

NEW APPLICATIONS ON THE HORIZON

While the use of laser-generated neutrons for actual transmutation is still a long way off, their application in biomedical and other fields is already within reach.

“At ELI, the neutron source developed by our research team at the University of Szeged is currently in operation. This beamline has been included in ELI’s most recent user access programs, and experience shows that nearly 10 percent of incoming proposals plan experiments using our beamline,” Professor Osvay noted. “Additionally, in the fall of 2025, we’ll be conducting a proof-of-principle experimental campaign in collaboration with an international consortium led by an Australian university, focusing on the production of isotopes for medical purposes. Our goal is to determine whether laser-generated neutrons can be used for isotope production and, if so, with what efficiency. At the moment, we’re working on optimizing the neutron beam for experimental use by applying artificial intelligence and deep learning algorithms.”

“Along the way in our transmutation project, it has become evident that our ion acceleration results are significant in their own right. Using a laser with a repetition frequency of 1 kHz, we can generate an ion beam with an average power of 4 watts, emerging from the liquid film,” the researcher added.

“That’s a beam powerful enough to be used even for cutting applications.”

“Another intriguing and highly beneficial application could be testing electronic devices for space technology, as the severe conditions in outer space – characterized by strong gamma, ion, and neutron radiation, along with a vacuum – closely resemble those within our experimental chamber. However, until now, electronic devices intended for space have primarily been tested for their ability to withstand individual effects. In contrast, in our interaction chamber, we could assess their resilience against nearly all relevant factors simultaneously,” Professor Osvay pointed out in conclusion.





WHEN THE ALGORITHM BECOMES THE MEDICINE

A truly multidisciplinary summer school was held at the University of Szeged in June 2025, jointly organized by the Hungarian Centre of Excellence for Molecular Medicine (HCEMM), which focuses on the evolutionary dynamics of cancer, and the National Laboratory for Health Security, led by SZTE mathematician Gergely Röst. The two institutions hosted a workshop for international PhD students on the mathematical modelling of cancer dynamics.

We asked one of the guest lecturers, Professor Joel Brown – a mathematical oncologist at the Moffitt Cancer Center in the United States – about the role of tumor modelling in cancer research.

“Cancer is a highly dynamic condition – it evolves continuously, much like an epidemic: the infection spreads, people recover, gain immunity, lose it again, and new variants emerge. So, a tumor isn’t just a passive mass to be eliminated. Its cellular makeup is in constant flux. That’s what we aim to understand through mathematical methods.”

“Personalized medicine has long been a goal, yet current clinical practice still falls short of it. Today, in treating cancer, we begin by measuring a wide range of tumor characteristics, and based on those, we select the protocol that seems most effective against that particular tumor. If the treatment works, it is continued – until it no longer does. The patient may initially respond well and show improvement, but eventually the disease can return. At that point, the physician switches to what’s known as a second-line therapy. But from then on, we’re no longer guiding the process – we’re left struggling to keep pace. So, in the case of cancer, our goal is to show that personalized medicine should not only mean having a wide arsenal of drugs – it should mean applying individualized algorithms to design the treatment itself. In essence, *the algorithm becomes the medicine*,” Professor Brown emphasized.



Sándor PANEK

Szylvia MARÓTINÉ PÁNTOS



THE HIDDEN MATHEMATICS OF GAMES

Dr. Viktor Vígh, Associate Professor in the Department of Geometry at the Bolyai Institute, part of SZTE’s Faculty of Science and Informatics, has been awarded the 2025 Gács András Prize, founded by Eötvös Loránd University (ELTE). According to the award citation, the young mathematician inspires students not only through his research achievements, but also with his versatility, openness, and sense of humor. A display case in the hallway of the Bolyai Institute showcases a collection of games of logic that Dr. Viktor Vígh has either created or collected over the years.

Reflecting on how this passion began, Professor Vígh shares a personal memory:

“I inherited my interest from my father, who was a math teacher. Back in the 1970s and ‘80s, he started collecting games of logic that were sold at local kiosks. He had around 20 or 30, and I loved playing with them. Later, when I was a postdoc in Canada, I often stopped by a campus bookstore after lunch, where one shelf was packed with these types of games. I kept eyeing them until I finally gave in and bought one – then another – and that’s when things really took off. I began collecting them earnestly. I even got my dad back into it; I think now he has more than I do. He has more time and even builds his own. What’s interesting is that these games can contain real mathematical challenges. Take that picture-hanging game over there – I even wrote an article about it. As it turns out, the most difficult question it raises had already been described by topologists ten years earlier – though they had no idea it was also known in game form. So, the problem had emerged independently in topology, entirely on its own merits.”

Professor Vígh goes on to describe in detail this particularly intriguing example from his collection:

“In Dr. Smile’s office, there’s a picture hanging on two nails. Its special property is that if you remove either nail, the picture falls. But is it actually possible to hang a picture like that? And what if I want to hang it on seven nails in such a way that removing any one of them causes it to fall? Or what if I want it to fall only if at least three of the seven are removed – and otherwise stay up? You can pose really complex questions like these. They lead to surprisingly deep topology, algorithms, combinatorics – you can use them to explore all kinds of mathematics,” says Dr. Viktor Vígh.



Sándor PANEK

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