

EXHIBITION

MATHEMATICS IN UKRAINE: CONTINUING TRADITIONS

June 2026, Paris (France)



The tradition of higher education in Ukraine dates back to the Ostroh Academy (1576). The Kyiv-Mohyla Academy traces its origins to 1632; in later decades, subjects such as algebra, geometry, mechanics, trigonometry, and mathematical chronology were taught there. Its graduates contributed to the development of education. In the modern sense, however, the first university was established in Lviv in 1661, marking the emergence of university-level education in Ukraine. A separate department of mathematics was created there, along with extended courses for the preparation of mathematics teachers.

**Institute for Applied Problems of Mechanics
and Mathematics (Lviv), National Academy
of Sciences of Ukraine**

– for Iryna Banakh

Ivan Franko National University of Lviv

– for Taras Banakh, Viktoriia Brydun, Olena Hryniv,
Yaroslav Prytula, Mykhailo Zarichnyi



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for the conference
Ukrainian Mathematics Days 2026
Coordination by Vincent Runge
Conception & Graphic Design
by Wonjin Park

The study of mathematics in present-day Ukraine can be traced back to Kyivan Rus, with evidence dating from the 10th–11th centuries. The first schools operated at churches and monasteries, which served as centers of culture and education. The first library of Kyivan Rus was founded by Prince Yaroslav the Wise and was located on the territory of St. Sophia Cathedral in Kyiv. From the 14th century, mathematics was taught in cathedral schools, Orthodox fraternal schools, and Jesuit collegiums. Jesuits followed the Ratio Studiorum and combined classical humanistic education with elements of the exact sciences, drawing on Euclid's Elements and works by Aristotle.

By the early 19th century, the lands of present-day Ukraine were divided between major European empires. Universities were founded in Kharkiv (1804), Kyiv (1834), and Odesa (1865) in the Russian Empire. In the western regions, at the universities in Lviv and Chernivtsi (1875), higher education developed under the Austro-Hungarian Empire. These institutions became important centers of teaching and research, attracting scholars educated at leading European universities and training professional mathematicians. Analysis, geometry, algebra, mechanics, and probability theory were among the mathematical subjects taught, while research in these areas and a professional mathematical community gradually emerged.

OSTROGRADSKY, BUNYAKOVSKY, VORONOI

Mykhailo Ostrogradsky (1801–1862) was born in Pashenna in the Poltava region; he was of Cossack heritage. Ostrogradsky is best known for his contributions to mathematical physics, the calculus of variations, mechanics, and the integration of algebraic functions. He studied mathematics at the University of Kharkiv and continued his studies in Paris (1822–1826) at the Sorbonne and the Collège de France. His Divergence theorem (the Gauss–Ostrogradsky theorem) is fundamental to vector calculus and is widely used in physics and engineering.

$$\iiint_V (\nabla \cdot \mathbf{F}) \, dV = \iint_S (\mathbf{F} \cdot \hat{\mathbf{n}}) \, dS.$$

Gauss-Ostrogradsky theorem



Lithograph by A. Munster,
<https://uinp.gov.ua/istorychnyy-kalendar/veresen/24/1801-narodyvsya-myhaylo-ostrogradskyy-vydatnyy-matematyk>

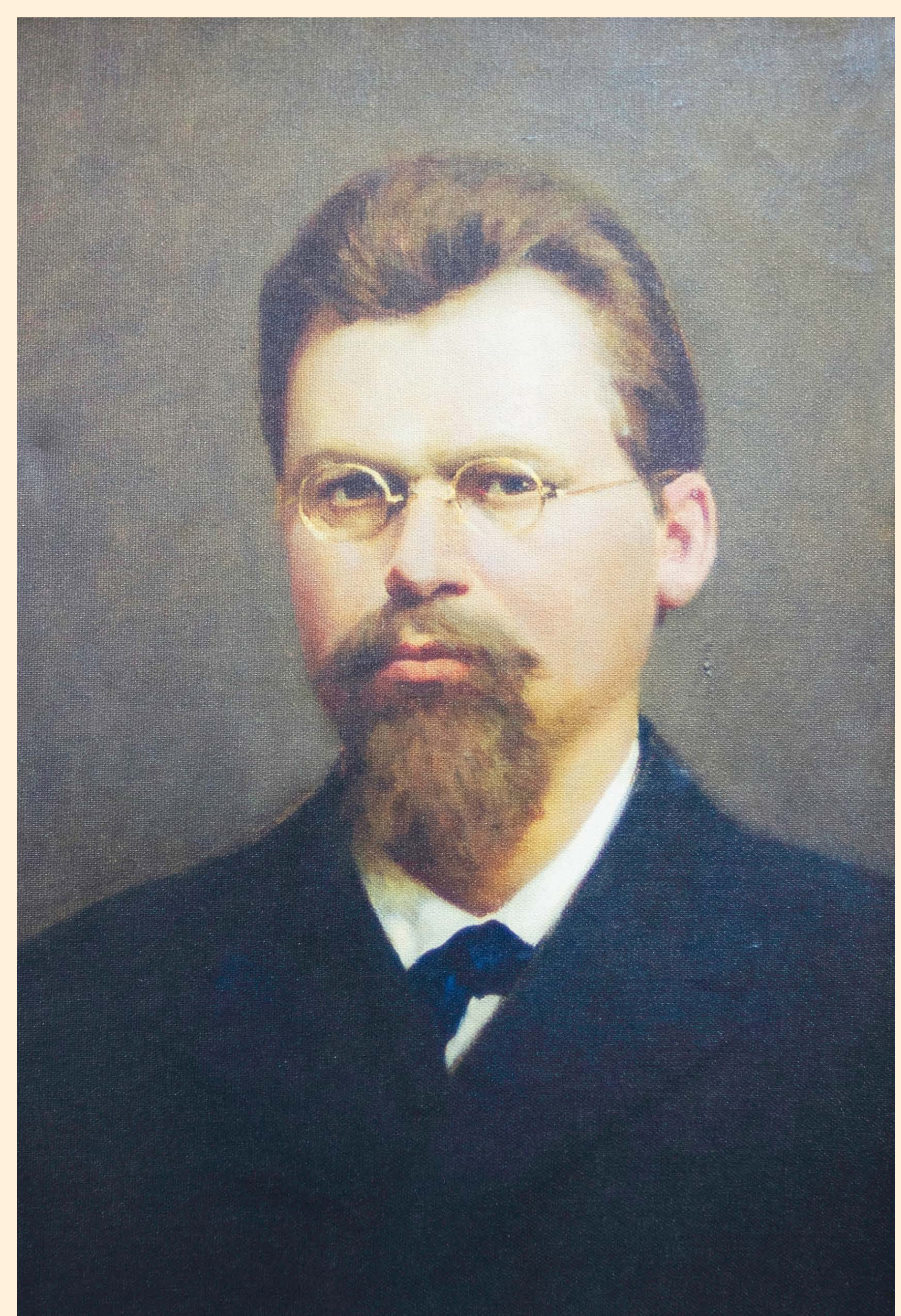


Courtesy of Faculty of Mathematics, Computer Science and Physics of Drahomanov Ukrainian State University

Viktor Bunyakovsky (1804–1889), a native of the city of Bar in Podillia (now Vinnytsia Oblast), was one of the most prominent mathematicians of the 19th century. He studied in Paris (at the Sorbonne and École Polytechnique) and attended lectures by Laplace and Poisson; he defended his doctoral dissertation under the supervision of Augustin-Louis Cauchy (1825). Among his famous results is the proof of the inequality (known as the Cauchy–Bunyakovsky–Schwarz inequality) for integrals and infinite-dimensional spaces. In number theory, he formulated a hypothesis (known as the Bunyakovsky conjecture) that any irreducible polynomial with integer coefficients that satisfies some natural conditions takes infinitely many prime values on the set of natural numbers.

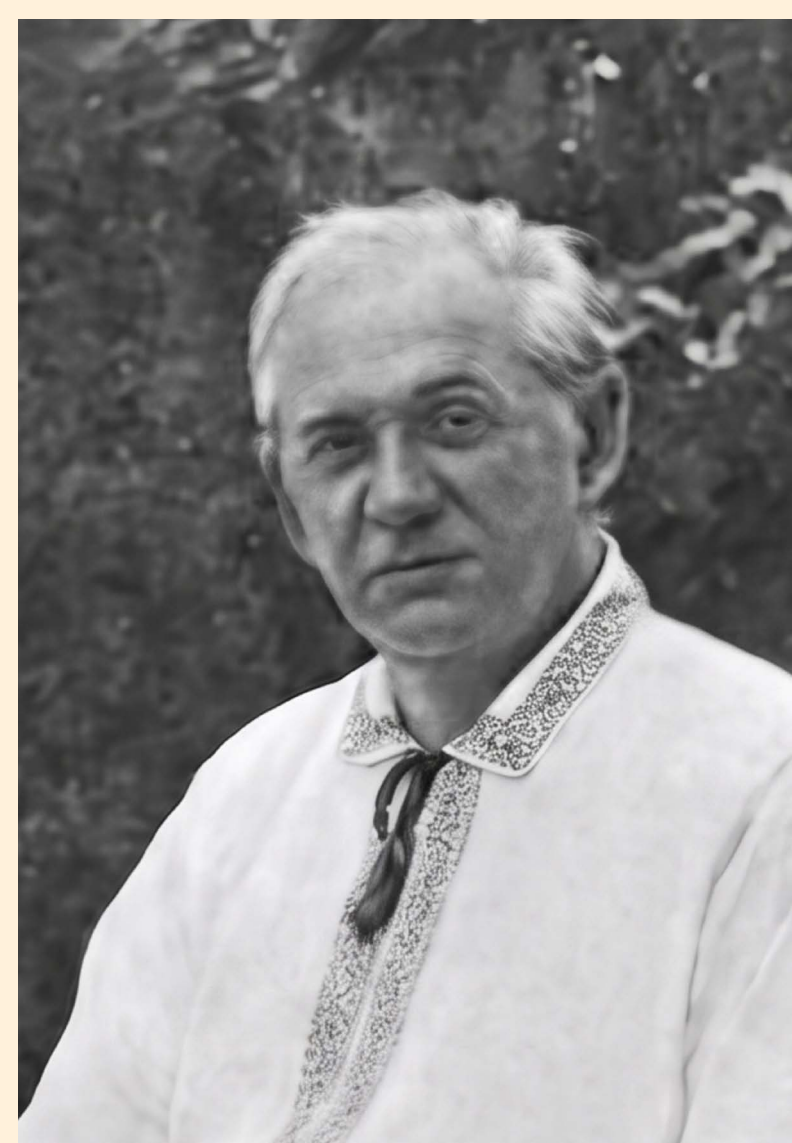
Heorhiy Voronyi (also known as Georgy Voronoi, 1868–1908) was born in Zhuravka in the Poltava region (now Chernihiv Oblast), educated at St. Petersburg University, and later worked at the University of Warsaw. Voronyi specialized in number theory, particularly in the theory of algebraic numbers and geometry of numbers. He is best known for the concept of the Voronoi diagram (a partitioning of a plane into regions based on distance to a finite set of points). Voronoi diagrams are ubiquitous in computational geometry, ecology, urban planning, and crystallography.

Among Voronyi's students was the prominent Polish mathematician Wacław Sierpiński.



Courtesy of Faculty of Mathematics, Computer Science and Physics of Drahomanov Ukrainian State University

MATHEMATICS IN KYIV



<https://nibu.kyiv.ua/exhibitions/687/>

Dmytro Grave (1863–1939) graduated from St. Petersburg University, where he studied under Chebyshev. He was a professor at Kharkiv and later at Kyiv universities, becoming the founder of the Kyiv algebraic school. He also contributed to applied mathematics and mechanics. Grave was an academician of the Ukrainian Academy of Sciences and served as the first director of the Institute of Mathematics in Kyiv.

Among his students were such prominent mathematicians as Naum Akhiezer and Mykhailo Kravchuk.

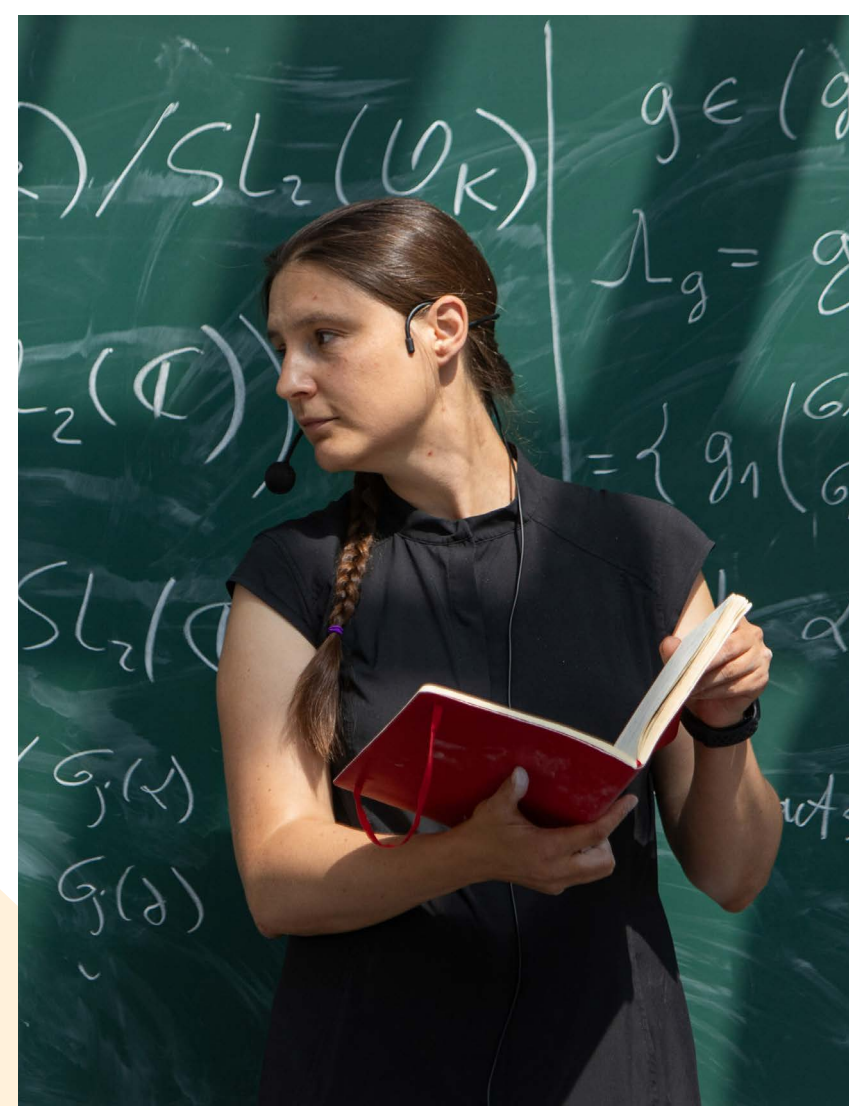
Mykola Bogolyubov (1909–1992) began his scientific career at the age of 14, joining the research seminar of Dmytro Grave at Kyiv University. In 1925, at the age of 16, he was admitted directly to postgraduate studies at the Ukrainian Academy of Sciences, where he collaborated closely with Mykola Krylov. Prof. Bogolyubov worked at Kyiv University. In 1940, he was also sent to the Chernivtsi State University to help organize its mathematical departments.

His fundamental contributions include the Krylov–Bogolyubov averaging method, Bogolyubov transformations, and the Bogolyubov inequality.

Oleksandr Sharkovsky (1936–2022) graduated from Kyiv University and worked at the Institute of Mathematics in Kyiv. He is world-renowned for Sharkovsky's theorem, proved in 1964, which is a fundamental result in the theory of discrete dynamical systems. A famous implication of this theorem is that if a continuous function on an interval has a periodic point of period 3, then it must have periodic points of all other periods.

$$\begin{aligned} 3 < 5 < 7 < 9 < 11 < 13 < 15 < \dots < 2 \cdot 3 < 2 \cdot 5 < 2 \cdot 7 \\ < 2 \cdot 9 < \dots < 2 \cdot 2 \cdot 3 < 2 \cdot 2 \cdot 5 < 2 \cdot 2 \cdot 7 \\ < 2 \cdot 2 \cdot 9 < \dots < 2 \cdot 2 \cdot 2 \cdot 3 < \\ \dots < 2^5 < 2^4 < 2^3 < 2^2 < 2 < 1. \end{aligned}$$

Sharkovsky ordering



Photograph by Joseph Sywenkyj,
9 August 2023, Kyiv,
courtesy of ICMU

Maryna Viazovska is a winner of the Fields Medal — one of the most prestigious awards in mathematics. She received this highest honour in 2022 for her breakthrough solution to the sphere-packing problem in higher-dimensional spaces. Viazovska completed her undergraduate studies at Taras Shevchenko National University of Kyiv. She is currently a Professor at École Polytechnique Fédérale de Lausanne (EPFL) and the Scientific Director of the International Centre for Mathematics in Ukraine (ICMU). Viazovska is the second woman ever to receive the Fields Medal.

Mykhailo Kravchuk (also known as Krawtchouk, 1892–1942) was born in Chovnytsia in the Volyn region. Educated at Kyiv University, he held a position at the Institute of Mathematics of the Academy of Sciences and also worked as a professor at the University and Polytechnic Institute in Kyiv. He was the author of fundamental works on algebra, analysis, and mathematical physics. Kravchuk polynomials are widely used in probability theory, coding, and quantum physics. He was a co-author of the first three-volume dictionary of Ukrainian mathematical terminology. In 1938, Kravchuk was arrested by the Soviet authorities and sentenced to the Gulag; he died in a camp in Kolyma.



Collection of Stefanyk
National Scientific Library of
Ukraine in Lviv

Ostap Parasyuk (1921–2007) was born in the Lviv region and graduated from Lviv University. His scientific career took him to the Institute of Mathematics in Lviv and Kyiv, where he also played an important role in the establishment of the Institute for Theoretical Physics. His main achievements span quantum field theory (notably the Bogolyubov–Parasyuk theorem and the Bogolyubov–Parasyuk R-operation), probability theory (the multidimensional local limit theorem), dynamical systems (solving the von Neumann problem), and functional analysis (multiplication of generalized functions).

Leonid Plyushch (Léonide Pliouchtch, 1939–2015) was a mathematician, literary critic, and active participant in the human rights movement who became a symbol of intellectual resistance to the Soviet system. After graduating from Kyiv University, he worked at the Institute of Cybernetics. In 1972, he was arrested for his activism and subjected to forced psychiatric treatment. Following an international campaign for his release, he moved to France in 1976.

Kateryna Yushchenko (1919–2001) began her scientific career in 1946 at the Lviv branch of the Institute of Mathematics. In 1955, she invented the Address Programming Language – the first high-level programming language in continental Europe. Developed in Kyiv, her invention preceded many internationally recognized languages and established her as a true computing pioneer.



Photograph from
the family archive

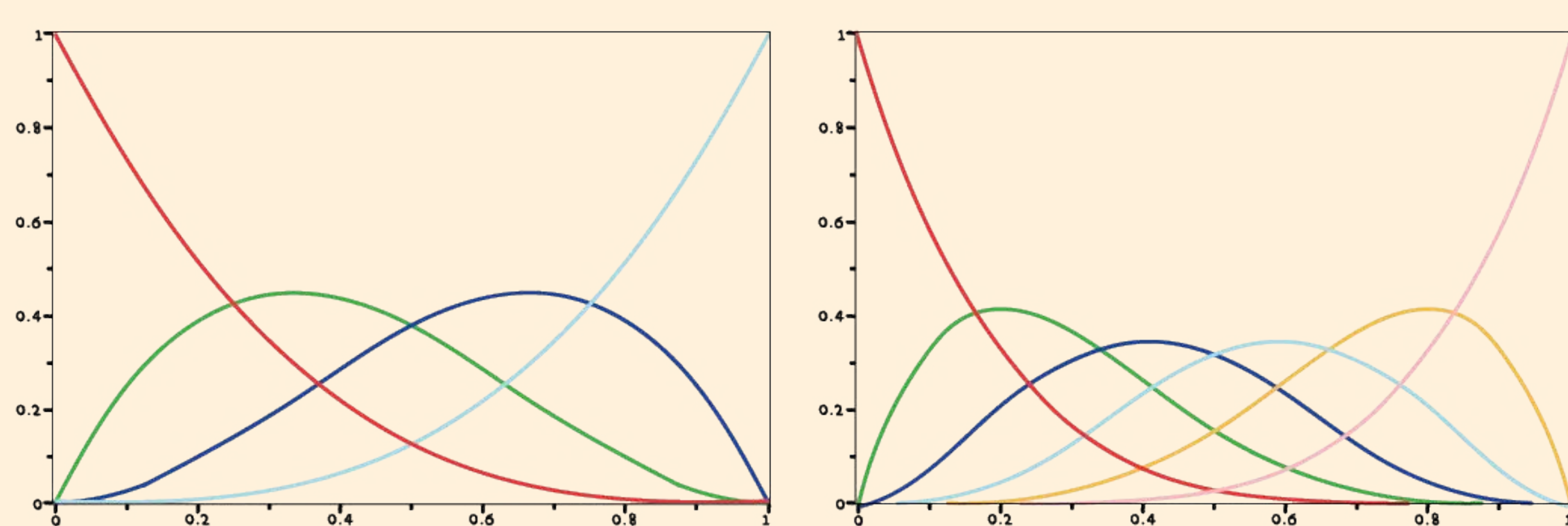


Photograph from Kateryna
Pozharska's collection

Kateryna Pozharska graduated from Lesya Ukrainka Eastern European National University in 2015. Since 2018, she has been working at the Institute of Mathematics in Kyiv. In 2023, she received the Joseph F. Traub Information-Based Complexity Young Researcher Award.

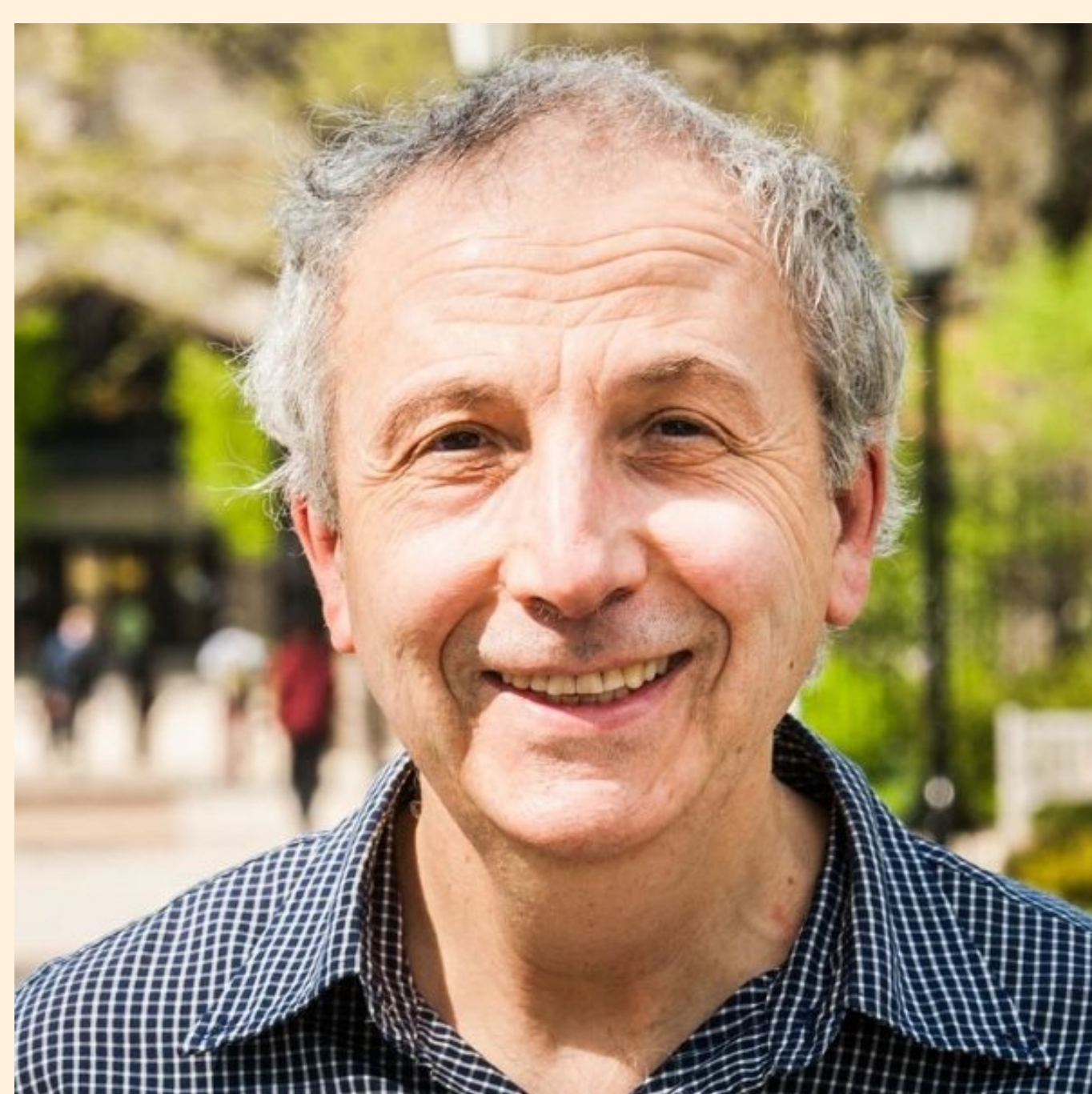
MATHEMATICS IN KHARKIV

Serhiy Bernstein (1880–1968) was born in Odesa and studied at the Sorbonne and Göttingen under Charles Émile Picard and David Hilbert. A professor at Kharkiv University, he maintained ties with Western European mathematicians. In 1904, he gained international acclaim by solving Hilbert's 19th problem, proving that solutions to certain analytic variational problems are themselves analytic functions. He is recognized as the founder of the constructive theory of functions, and renowned for his classic theorem on monotone functions and his pioneering work on the axiomatic foundations of probability theory. Bernstein polynomials and inequalities remain fundamental tools in mathematics.



Bernstein polynomials

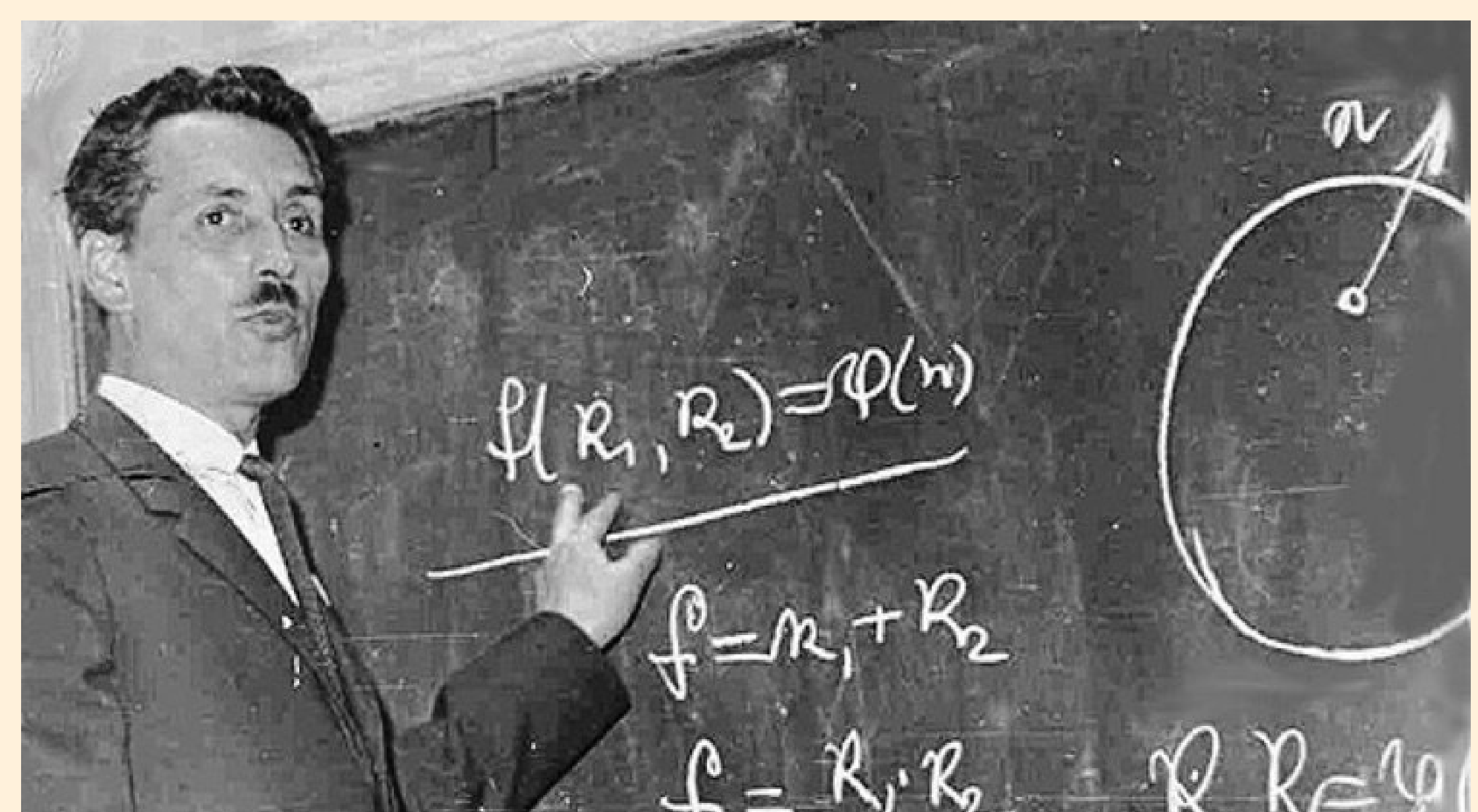
Volodymyr Drinfeld (b. 1954) is the first Ukrainian-born mathematician to be awarded the Fields Medal. A native of Kharkiv, he conducted much of his most influential research at the Verkin Institute for Low Temperature Physics and Engineering. His work includes the introduction of quantum groups, foundational contributions to the geometric Langlands program, and deep results connecting algebraic geometry, number theory, and mathematical physics. He also solved a classical problem posed in the 1920s by the Lviv mathematician Stanisław Ruziewicz, proving that the Lebesgue measure on n -spheres for $n=2$ and $n=3$ is uniquely determined by its properties, invariant under rotation. Since 1999, Drinfeld has been a professor at the University of Chicago.



<https://mathematics.uchicago.edu/people/profile/vladimir-drinfeld1/>

Naum Akhiezer (1901–1980) was a leading figure of the Kharkiv mathematical school. A student of Dmytro Grave, he moved to Kharkiv at the invitation of Serhiy Bernstein and headed the Kharkiv Mathematical Society for over three decades. He made contributions to approximation theory, where he applied methods of the geometric theory of functions of a complex variable. His legacy includes the Baker–Akhiezer functions, which became a fundamental tool in modern mathematical physics and the theory of integrable systems. Akhiezer authored classic monographs that remain essential for mathematicians worldwide.

Oleksiy Pogorelov (1919–2002) was a graduate of Kharkiv University whose scientific career was closely tied to the city. He made fundamental advances in geometry “in the large,” solving the classic Minkowski and Weyl problems regarding the rigidity of convex surfaces. In 1973, he provided a solution to Hilbert's 4th problem, classifying the realizations of classical axiomatic systems. Pogorelov's research on Monge–Ampère equations remains a cornerstone of modern geometric analysis.



Courtesy of Karazin Kharkiv National University

Yulia Zdanovska (2000–2022) was a promising mathematician from Kharkiv. A winner of numerous all-Ukrainian and international Olympiads in mathematics and computer science for school students, she graduated from Taras Shevchenko National University of Kyiv. Driven by a dream of bringing high-quality education to rural schools, she dedicated herself to volunteering through the “Teach for Ukraine” program. At the age of 21, Yulia was killed during a Russian missile strike on her home city.



<https://www.bbc.com/ukrainian/articles/cv2vn31gm25o>
Foto by Vasylyna Borysiuk

MATHEMATICS IN LVIV

Józef Pużyna (1856–1919)

A visionary professor at Lviv University who played a decisive role in shaping the city's mathematical landscape. He founded the Mathematical Society in Lviv in 1917.

The Lwów School of Mathematics

A research community active in Lviv in the 1920s–1930s. It made significant contributions to functional analysis, probability theory, and topology, and became known for its distinctive style of collaboration. The mathematicians met regularly at the Scottish Café, where they discussed problems and recorded them in the **Scottish Book**, offering rewards for their solutions. Many of these problems remained unsolved for decades, and some continue to inspire researchers today.

Stefan Banach (1892–1945)

The central figure of the Lwów School of Mathematics, he was one of the founders of modern functional analysis and one of the most influential mathematicians of the 20th century.



Lwów School of Mathematics representatives



Sala Weiniłös
(from Album with photographs and dedications from students for Professor Kazimierz Twardowski, 1936)

Sala Weiniłös (1903–1941?)

She was the first and only woman to receive a doctorate in mathematics from the University of Lviv before World War II. Her academic development was shaped by the leading figures of the Lwów School of Mathematics. Under the scientific supervision of Hugo Steinhaus – himself a student of David Hilbert – she worked on the foundations of geometry, aiming to systematize Euclidean geometry through purely logical deductions and transform it into a rigorous formal system. Her dissertation contributed to the transition from Hilbert's classical axiomatics to metamathematical research.

After World War II

Research in functional analysis, initiated in Lviv before the war, continued in the post-war period. At the same time, a new generation of mathematicians developed other fields as well. The Lviv Mathematical Seminar became a center of scientific discussions and cooperation.

Yaroslav Lopatynskyi (1906–1981) was a founder of modern schools of algebra and differential equations in Lviv and Donetsk. He is world-renowned for the Lopatynskyi–Shapiro condition.

Anatolii Goldberg (1930–2008) was a founder of the Lviv School of Complex Analysis. He gained international recognition for his solution to the inverse problem of Nevanlinna theory and fundamental work on meromorphic functions.

Vladyslav Lyantse (1920–2007) formed a direct link to the interwar school, having attended Stefan Banach's seminars. He made significant contributions to operator theory and was a pioneer of nonstandard functional analysis in Ukraine.

The Shevchenko Scientific Society

Founded in Lviv in 1873, it was the first Ukrainian academy of sciences. It served as a vital platform for research and publishing in the Ukrainian language and included distinguished international members such as David Hilbert and Felix Klein. The Society's most notable representatives in mathematics were **Volodymyr Levytskyi** (1872–1956)

and **Mykola Chaikovskyi** (1887–1970), authors of the first research article and monograph in Ukrainian, and **Myron Zarytskyi** (1889–1961), known for his axiomatic system for boundary operations in topology. The Society continues to operate today as a global Ukrainian academic institution.



Myron Zarytskyi
(from the family archive)

Nowadays

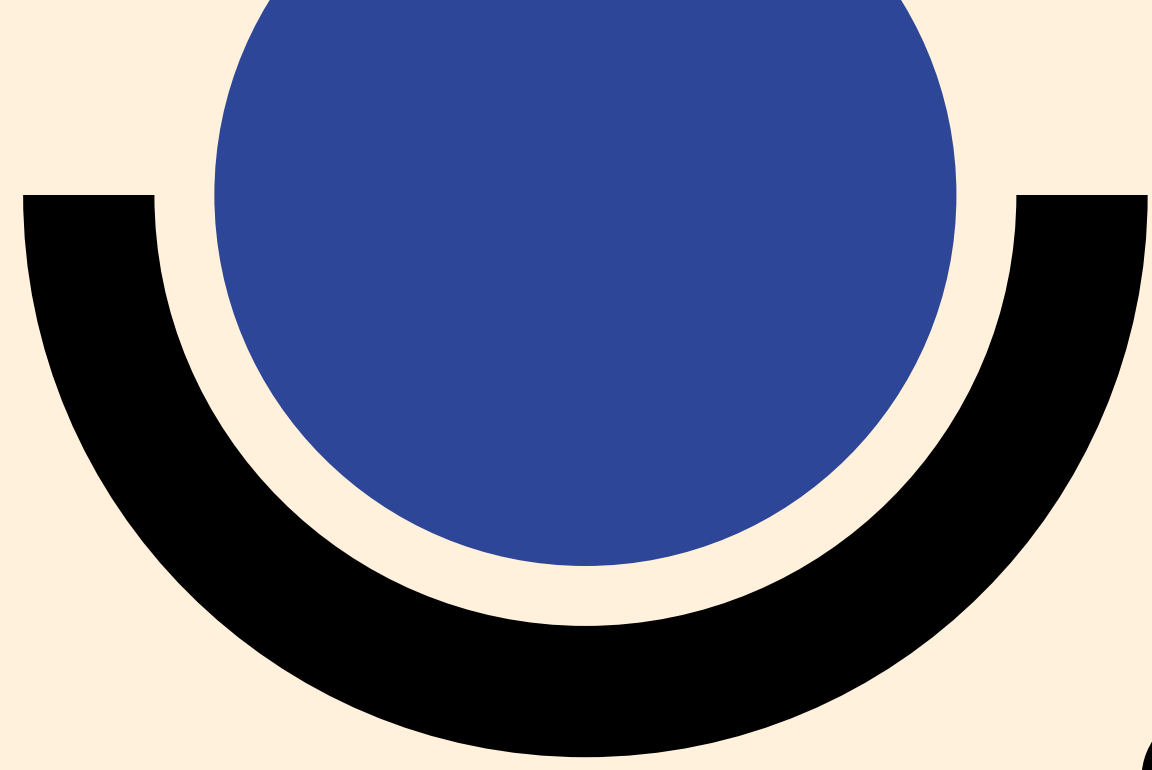
The Lviv Mathematical Society serves as the heart of a highly dynamic and influential community. Lviv mathematicians work in differential equations, complex analysis, algebra, topology, and other fields, maintaining the city's status as a major scientific center.



Logo of the Lviv Mathematical Society, <https://lmt.math.lviv.ua/en/>

Continuing traditions

In 2016, the Lviv Mathematical Society launched the **Lviv Scottish Book** as a modern successor to the legendary collection of open problems from 1935–1941. Selected problems are shared on MathOverflow, engaging the international mathematical community and continuing the tradition of collaborative discovery in the digital age.



MATHEMATICS IN ODESA, CHERNIVTSI, AND DONETSK

Hans Hahn (1879–1934) was a prominent Austrian mathematician whose foundational contributions include the Hahn–Banach theorem (functional analysis), the Vitali–Hahn–Sachs theorem (measure theory), and the Hahn–Mazurkiewicz theorem (topology). From 1909 to 1916, he held a professorship at Chernivtsi University. His legacy significantly influenced the development of function theory in Chernivtsi, a tradition that continues to flourish in the university’s research today.

Mark Krein (1907–1989) was a world-renowned mathematician born in Kyiv. His exceptional talent was recognized by Dmytro Grave, who recommended him for postgraduate studies in Odesa despite Krein never completing a formal undergraduate degree. In the 1930s, Krein established one of the world’s leading centers of functional analysis at Odesa University. His name is linked to several fundamental concepts, including the Krein–Milman theorem and Krein spaces, and his influence on operator theory and mathematical physics remains global.

Rostyslav Hryhorchuk (known as Grigorchuk, b. 1953) is a world-renowned mathematician born in the Ternopil region and closely connected to Chernivtsi. He has been a professor at Texas A&M University since 2002. He is famous for constructing a group of intermediate growth – now known as the Grigorchuk group – which solved several long-standing problems in group theory. In 2015, he was awarded the AMS Leroy P. Steele Prize for Seminal Contribution to Research.



Photograph from the family archive

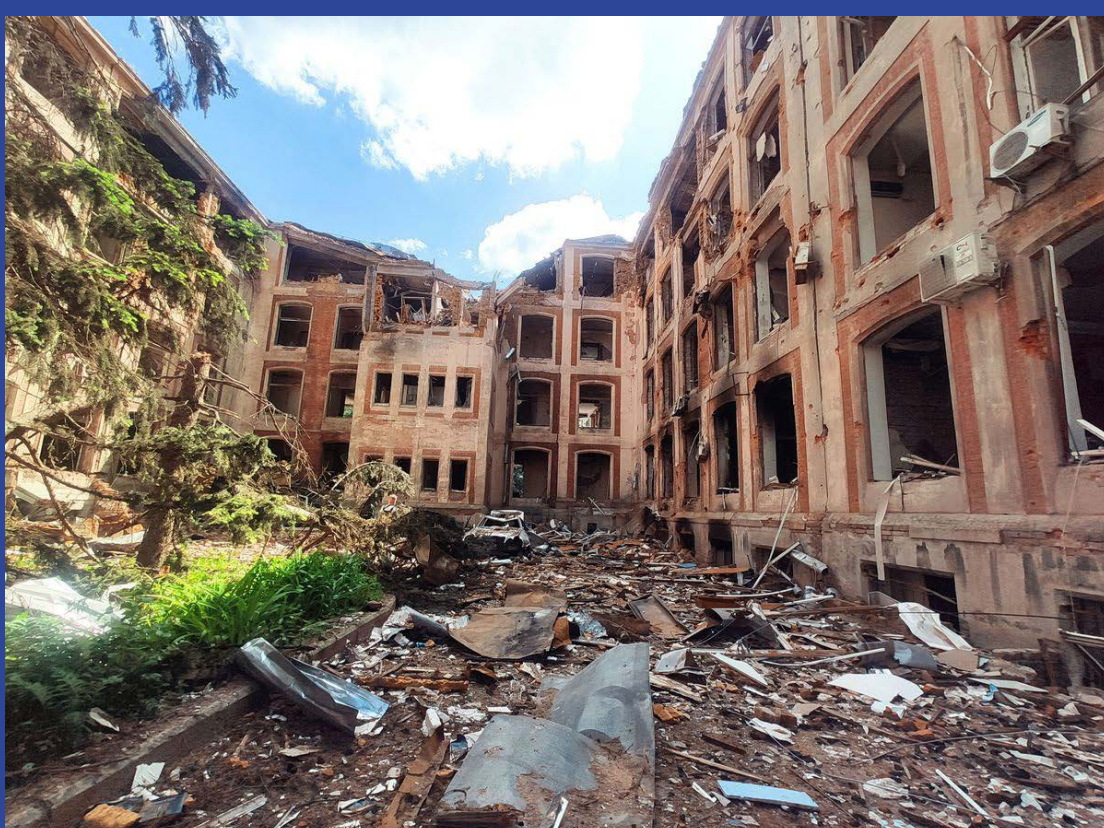
Ihor Skrypnyk (1940–2005) defended his thesis at Lviv University under Yaroslav Lopatynskyi. After moving to Donetsk, he established a major school of nonlinear analysis and later became director of the Institute of Applied Mathematics and Mechanics. His research included important contributions to topological methods in nonlinear elliptic problems and to the behavior of solutions in perforated domains. He was awarded an honorary doctorate by Lviv University – a distinction also conferred on Henri Lebesgue in 1938.

Today’s Reality

While we celebrate Ukraine’s profound mathematical heritage, we must acknowledge the grave challenges it faces due to the ongoing war of Russian aggression. Every day, people are dying in Ukraine, and civilian infrastructure, including scientific and educational, is under systematic attack. According to UNESCO:

- 4,163 educational institutions (including universities) were damaged or destroyed.
- 1,443 scientific institutions (mostly at universities) were damaged or destroyed.
- The cost of restoring university science is about \$1.26 billion.

Analysis of war damage to the Ukrainian science sector and its consequences, UNESCO, 2024
<https://www.unesco.org/en/articles/analysis-war-damage-ukrainian-science-sector-and-its-consequences>



Karazin Kharkiv National University, March 2022
<https://www.ukrainer.net/en/rebuilding-kharkiv/>



Kherson State University, March 2024
<https://khersonci.com.ua/accident/61485-rosijska-armiya-obstrilyala-hersonskij-derzhavnij-universitet.html>



Sumy State University, August 2025
https://weukraine.tv/novyny/armiya-rf-atakuvala-sumskij-derzhavnij-universitet-v-ova-pokazali-naslidki-udaru-foto/#google_vignette

However, even in these difficult circumstances, mathematics in Ukraine continues to thrive, honoring the profound traditions of our predecessors and remaining an integral part of the global scientific community.

In recent years, museums and cultural institutions have begun to reconsider how artists of Ukrainian origin have been described, especially when they were formerly presented only as “Russian” or “Soviet.” Kazimir Malevich is one notable example of this reassessment. A similar reflection is also relevant to the history of science. With this exhibition, we hope to contribute to a renewed recognition of Ukraine’s heritage in mathematics.

Coordinator, Vincent Runge