ANNUAL REPORT 2024

ICMU
INTERNATIONAL CENTRE FOR MATHEMATICS IN UKRAINE

WITH GRATITUDE TO

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KSE | Kyiv School of Economics

Klaus Tschira Stiftung

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ICMU is grateful to the photographers, friends and colleagues whose pictures illustrate this report: Piotr Achinger, Karyna Bibich, Gregory Bob, J.-F. Dars, Kristina Dubyna, Joseph Sywenkyj, Kateryna Tatarko, Lesyk Urban, Iryna Yehorchenko.

A BRIEF REVIEW OF 2024

This year, ICMU reached several important milestones. We acquired a workspace in Kyiv, established a professional administrative team, and successfully launched several scientific programmes.

We held three ICMU Summer Schools in western Ukraine, attracting over 120 participants from around the world. Lecturers came from Belgium, Canada, Hungary, Italy, Poland, Sweden, the UK, Ukraine, and the US. Notably, around 40% of participants were female, reflecting our ongoing commitment to inclusivity in mathematics. This year, our Centre also welcomed its first collaboration group and hosted several distinguished visitors who delivered insightful lecture courses at our workspace in Kyiv. Their contributions enriched our academic environment and fostered inspiring discussions. Another significant milestone was the foundation of ICMU’s library of modern mathematical literature, made possible by generous donations from Springer Publishing House, the French Mathematical Society, and several fellow mathematicians. We are delighted to announce that the catalogue will soon be available on our website, providing valuable resources for mathematicians across Ukraine. Additionally, our Centre launched the annual ICMU Student Research Award to recognise and encourage outstanding young researchers.

None of these achievements would have been possible without the generous support of our network of colleagues, partners, and supporters. We extend our heartfelt thanks to everyone who has contributed—whether scientifically, organisationally, or financially. Your dedication fuels our mission and inspires our future.

MARYNA VIAZOVSKA

Scientific Director of ICMU
Professor at École Polytechnique Fédérale de Lausanne

CO-ORDINATION COMMITTEE

The Committee consists of mathematicians of Ukrainian origin who founded ICMU in 2022 and currently coordinate the Centre's activities on a voluntary basis.

OLEKSANDRA ANTONIOUK
Institute of Mathematics of the National Academy of Sciences of Ukraine / Kyiv Academic University / American University Kyiv

DMITRI FINKELSHTEIN
Swansea University, UK, **Member of the Managing Board of ICMU**

ANDREY GOGOLEV
The Ohio State University, USA, **Member of the Managing Board of ICMU**

KOSTIANTYN IUSENKO
University of São Paulo, Brazil

OLEKSIY KLURMAN
University of Bristol, UK

VOLODYMYR NEKRASHEVYCH
Texas A&M University, USA

PAVLO PYLYAVSKYY
University of Minnesota, USA

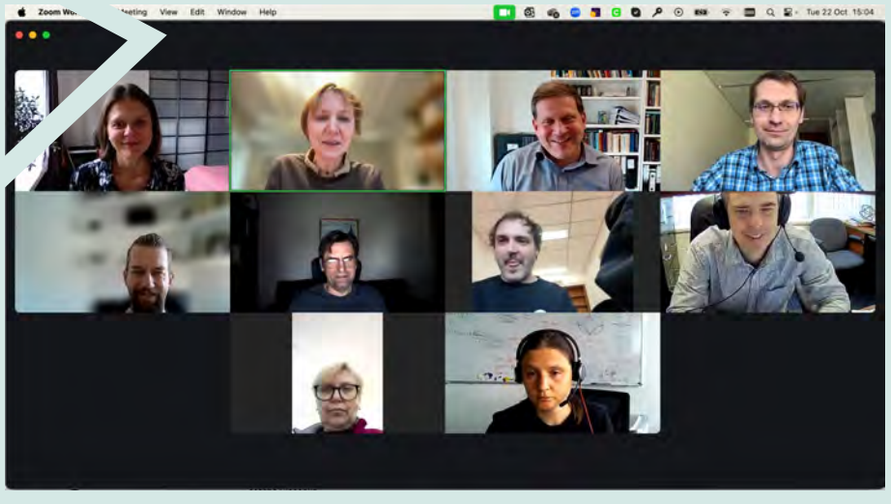
DMYTRO SAVCHUK
University of South Florida, USA

LYUDMYLA TUROWSKA
Chalmers University of Technology and University of Gothenburg, Sweden

MARYNA VIAZOVSKA
Winner of the Fields Medal 2022, Swiss Federal Institute of Technology in Lausanne, **Scientific Director of ICMU**

MASHA VLASENKO
Kyiv School of Economics, **Managing Director of ICMU**

IRYNA YEHORCHENKO
Institute of Mathematics of the National Academy of Sciences of Ukraine



Co-ordination Committee of ICMU at work, October 2024

SUPERVISORY BOARD

As an independent research institution, ICMU is governed by a board of trustees. The mission of the Supervisory Board is to promote the development of mathematical science in Ukraine by supporting the Centre's project implementation and strategic planning of its activities.

JEAN-PIERRE BOURGUIGNON

Chair of the Supervisory Board
Nicolaas Kuiper Honorary Professor at Institut des Hautes Études Scientifiques (IHES), Director of IHES (1994-2013), President of the Mathematical Society of France (1990-1992), and of the European Mathematical Society (1995-1998), President of the European Research Council (2014-2019)

"It is my belief that we must take any opportunity [...] to reflect on the major challenges the academic world faces these days in a time of major, and above all, accelerated changes. We, members of the academic world, must identify the principles on which actions on these challenges can be based and monitor how the different components of the academic community can be involved in them. For me, it is indeed important that each component of the academic community gets its share of responsibilities and opportunities in this process."

– Jean-Pierre Bourguignon, in his speech "A Crossroads of Challenges and a Factory of Hope: a University can never be too Ambitious!" given in front of the Finnish academic community and guests, August 2024

JØRGEN ELLEGAARD ANDERSEN

Founder and Head of the Center for Quantum Mathematics and Professor at the Department of Mathematics and Computer Science (IMADA) and DIAS Chair of Quantum Mathematics at the University of Southern Denmark (SDU)

OLHA BUDNYK & FUND OF THE PRESIDENT OF UKRAINE FOR THE SUPPORT OF EDUCATION, SCIENCE, AND SPORTS

Ex-officio member

The Fund supports the advancement of talented Ukrainians in education, science, and sports aiming to restore, empower and strengthen Ukraine's leadership positions in the world. Olha Budnyk is the Advisor of the President of Ukraine on the affairs of the Fund of the President of Ukraine for the support of Education, Science, and Sports.

SCIENTIFIC BOARD

The planning of the Centre's scientific activities is overseen by distinguished scientists from around the world. The Scientific Board is responsible for selecting the best proposals for organizing schools, research visits and other events at the Centre.

TARAS BANAKH
Ivan Franko National University of Lviv

ALEXANDRE EREMENKO
Purdue University, fellow of the American Mathematical Society

PAVEL ETINGOF
Massachusetts Institute of Technology, fellow of the American Academy of Arts and Sciences

PAVEL EXNER
Nuclear Physics Institute of the Czech Academy of Sciences, Vice president of the European Research council for the Physical Sciences and Engineering Domain (2011-2014), President of the European Mathematical Society (2015-2018)

ÉTIENNE GHYS
École normale supérieure de Lyon, French National Centre for Scientific Research (CNRS) and French Academy of Sciences

ROSTISLAV GRIGORCHUK
Texas A&M University, a fellow of the American Mathematical Society

OLEKSIY KAPUSTIAN
Taras Shevchenko National University of Kyiv

VOLODYMYR MAZORCHUK
Uppsala University, President of the Swedish Mathematical Society (2020-2023)

YULIYA MISHURA
Taras Shevchenko National University of Kyiv, member of the International Statistical Institute

SIMON SALAMON
King's College London, **Representative of the London Mathematical Society in the Scientific Board of ICMU for coordination of the joint programme**

PETER SCHOLZE
Director of the Max Planck Institute in Bonn, winner of the Fields Medal 2018

MARIYA SHCHERBINA
B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine. Member of the Institute for Advanced Study in Princeton, Member of the Virtual Ukraine Institute for Advanced Study

DMITRY SHEPELSKY
B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine

ADAM SKALSKI
Deputy director of the Institute of Mathematics of the Polish Academy of Sciences in Warsaw, member of the Executive Committee of the European Mathematical Society

MARCELO VIANA
Director of Instituto Nacional de Matemática Pura e Aplicada in Rio de Janeiro, Vice President of the International Mathematical Union (2011-2014). President of the Brazilian Mathematical Society (2013-2015)

EFIM ZELMANOV
Southern University of Science and Technology in China, winner of the Fields Medal 1994

Vladimir Drinfeld accepted an invitation to join the Scientific Board of ICMU for a one-year term ending in June 2024. The International Centre for Mathematics in Ukraine expresses its deep gratitude to Professor Drinfeld for his contributions to the establishment of ICMU and his work on the Scientific Board.

Mid-year Meeting of the Scientific Board of ICMU, June 2024

Annual Meeting of the Scientific Board of ICMU, December 2024

OPENING OF THE WORKING SPACE OF ICMU IN KYIV

29 February 2024

Our partner organization, the Kyiv School of Economics (KSE), has generously provided ICMU with a temporary workspace on its campus at Mykoly Shpaka Street 3, 03113 Kyiv. The space includes a single office and a common room with several desks, bookshelves and blackboard, totaling approximately 25 sq.m. These rooms are fully available for use by mathematicians, while ICMU administrators utilize the adjacent administrative workspace of KSE. Additionally, KSE provides lecture rooms and technical support for our events.

Masha Vlasenko (Kyiv School of Economics, Managing Director of ICMU) gives a lecture “Numbers, shapes, and ideas” at the inauguration ceremony of ICMU working space at KSE, 29 February 2024

"Ukraine’s resilience and future depend on world-class innovation and creativity — and that starts with mathematics. At KSE, we support cutting-edge research and education in math because it shapes smart minds and real-world solutions. That’s why we’ve backed ICMU from day one.”

— Tymofii Brik, Rector of KSE University

The ICMU workspace at the Kyiv School of Economics features bookshelves filled with books donated to the ICMU library by Springer Publishing House. The books were delivered in February, and their online catalogue is expected to appear on the ICMU website in 2025.

A lively discussion around the blackboard at ICMU, November 2024

CRASH COURSE IN ALGEBRAIC TOPOLOGY

6-10 May, ICMU working space in Kyiv

The first distinguished visitor of ICMU was Stephan Klaus (University of Mainz, Scientific Administrator at the Oberwolfach Research Institute for Mathematics). Professor Klaus conducted a week-long crash course in algebraic topology, attended by over 40 participants — about half of whom were students from other Ukrainian cities.

Algebraic topology studies topological spaces by methods of abstract algebra. The course was aimed for students, doctoral students and scientists with prior knowledge of general topology and basics of differential geometry. The main stream of lectures was conducted in the afternoons. Morning sessions were intended to cover some background questions and additional topics.

44 participants on-site, 32% female

Lectures in a classroom and in a bomb shelter

"...There was an [air raid] alert every second day on average (thus I experienced about four of them), and most of them happened during day-time when I gave my lectures at ICMU. As the early warning distance is about 15 minutes, we had enough time to go to the shelter in the cellar of ICMU where there is even a prepared lecture room to continue with the lecture.

...It was very nice to meet all the colleagues and students in Ukraine. There was a big feeling of hospitality, and a strong interest and dedication among the participants to learn new mathematical topics. I had a lot of enjoyable and fruitful discussions. I will definitely visit ICMU again!"

— Stephan Klaus, reflecting on his visit to Kyiv

Stephan Klaus after his lecture in a bomb shelter in Kyiv, May 2024

ICMU SUMMER SCHOOL “PROBABILITY, GEOMETRY AND MACHINE LEARNING”

14-21 July, Ukrainian Catholic University, Lviv

Theoretical foundations of machine learning are based on high-dimensional probability, an area guided by geometric insight. This school introduced the participants to problems and techniques that lie at the rich interface of high-dimensional probability, convex geometry, machine learning and optimal transport.

38 participants on-site, 44% female

LECTURE COURSES

Isoperimetric inequality, concentration of measure and log-concave densities

KÁROLY BÖRÖCZKY, Alfréd Rényi Institute of Mathematics

Optimal transport and machine learning

AUGUSTO GEROLIN, University of Ottawa, LMS Distinguished Visiting Fellowship

Positive pluses and negative pluses

PIOTR NAYAR, University of Warsaw

Limit distribution of the eigenvalues of a symmetric random matrix

MARK RUDELSON, University of Michigan

ORGANISERS

GALYNA LIVSHYTS, Georgia Tech
ANDRIY PRYMAK, University of Manitoba
KATERYNA TATARKO, University of Waterloo
ROMAN VERSHYNIN, University of California, Irvine
VLAD YASKIN, University of Alberta
TETYANA ZAKHARCHENKO, Ukrainian Catholic University

ICMU SUMMER SCHOOL “ATA XVI: SUB-RIEMANNIAN GEOMETRY AND OPTIMAL TRANSPORT”

29 July – 7 August, Kolochava, Ukraine

This school continued the tradition of Algebra, Topology and Analysis (ATA) summer schools in Ukraine. This year's edition had minicourses on sub-Riemannian geometry and optimal transport along with other lectures delivered by the school participants.

40 participants on-site, 35% female

LECTURE COURSES

Linear geometry

TARAS BANAKH, Ivan Franko Lviv National University

Sub-Riemannian geometry

SAMUËL BORZA, International School for Advanced Studies (SISSA), Trieste

An introduction to optimal transport

WILHELM KLINGENBERG, Durham University

Introduction to manifolds

SERGIY MAKSYMENKO, Institute of Mathematics of NAS of Ukraine / Kyiv Academic University

OTHER LECTURES

LUIGI AMBROSIO, Scuola Normale Superiore di Pisa
ANDREI AGRACHEV, International School for Advanced Studies (SISSA)
DANIEL BALLESTEROS-CHÁVEZ, Poznań University of Technology
DMITRIY BOLOTOV, B.Verkin Institute for Low Temperature Physics and Engineering of NAS of Ukraine
ARTEM HAK, National University of Kyiv-Mohyla Academy
ROSTISLAV GRIGORCHUK, Texas A&M University
YAROSLAV HRUSHKA, Institute of Mathematics of NAS of Ukraine
OLENA KARLOVA, Yuriy Fedkovych Chernivtsi National University
MYKOLA KOZLOVSKYI, Yuriy Fedkovych Chernivtsi National University
TSZ LO FONG, Hong Kong
NATALIA MAZURENKO, Vasyl Stefanyk Precarpathian National University
OLEKSANDR POKUTNYI, Institute of Mathematics of NAS of Ukraine
ANATOLII SERDYUK, Institute of Mathematics of NAS of Ukraine

ORGANISERS

TARAS BANAKH, Ivan Franko Lviv National University
DMITRIY BOLOTOV, B.Verkin Institute for Low Temperature Physics and Engineering of NAS of Ukraine
SAMUËL BORZA, International School for Advanced Studies (SISSA), Trieste
OLENA KARLOVA, Yuriy Fedkovych Chernivtsi National University
WILHELM KLINGENBERG, Durham University
SERGIY MAKSYMENKO, Institute of Mathematics of NAS of Ukraine / Kyiv Academic University

"The summer school in Ukraine was a success. Four strong researchers from America, Canada, Hungary and Poland came to Lviv to give Ukrainian students the opportunity to immerse themselves in the atmosphere of modern mathematics. It is difficult for future scientists of Ukraine to join the international mathematical community now, and this is especially true for guys — the border is closed to them. Therefore, `if the mountain won't come to Muhammad then Muhammad must come to the mountain', and the lecturers lived next to the students, communicated, sat with them every evening, helping them solve homework. And they were delighted with Lviv, with Ukraine, with the local people. They are ready to come again."

— Roman Vershynin, professor at University of California, Irvine and Associate Director of the Center for Algorithms, Combinatorics and Optimization, organiser of ICMU Summer School "Probability, Geometry, and Machine Learning"

"Gained new knowledge! And, maybe more importantly, the feeling for new research was born!"

— Oleksandra Desiateryk, professor at Taras Shevchenko National University of Kyiv, participant of ICMU Summer School "Probability, Geometry, and Machine Learning"

"As usual, an extraordinarily cool event from the ICMU. There was an unbelievable mathematical environment... Giving 100000 out of 10"

— Yelyzaveta Hlushchuk, student at Odesa National Maritime University

"It was an incredibly enriching experience, challenging but immensely rewarding. I'm grateful to all the organisers, lecturers, and fellow participants for making it such a powerful journey! Waiting for new events from ICMU!"

— Marta Sumyk, Ukrainian Catholic University, student and ML Lab Researcher

"As a co-organizer of this school, on behalf of all participants, I express my deep and boundless gratitude to the International Center for Mathematics in Ukraine (ICMU) for the wonderful opportunities:
1. to share our mathematical knowledge with inspiringly talented Ukrainian youth;
2. to gain experience from Ukrainian and international leaders of modern mathematics;
3. to combine science with engaging and fun leisure time in our picturesque Carpathians — especially our 'Easy trip to the nearest mountain' (as it was announced in the chat that morning), which turned into a real hike to Mount Topas, 1540 meters high, sometimes through nearly impenetrable thickets, after which everyone ran out of water, and instead of returning for lunch at 3:00 PM, we got back practically after dinner :)
and most importantly:
4. to feel that Ukrainian mathematics is alive, developing, and has a future."

— Olena Karlova, professor at Yuriy Fedkovych Chernivtsi National University, organiser of ICMU Summer School "ATA XVI: Sub-Riemannian Geometry and Optimal Transport"

"Awesome school. I really enjoyed such a barrier-free communication with professors. We went to swim in the river, played table tennis, played and sang the guitar, and talked about math till late night. I am happy this event took place. Now I am motivated to keep on my math research."

— anonymous School participant (a quote from feedback form)

ICMU SUMMER SCHOOL “OPERATOR ALGEBRAS, QUANTUM GROUPS AND QUANTUM INFORMATION THEORY”

4-10 August, Babyn village

Operator algebras serve as a natural setting for the description of non-commutative phenomena in Analysis and provide a large part of mathematical formalism of Quantum Physics. In particular, the past decade has witnessed a burst of interactions between operator algebras, quantum information theory and quantum groups. The school introduced the participants to the basic techniques of operator algebras and quantum groups and their fascinating links to quantum information theory through non-local games.

21 participants on-site, 19% female

LECTURE COURSES

Tomita-Takesaki theory and applications to quantum groups

JACEK KRAJCZOK, Vrije Universiteit Brussel

Introduction to C*-algebras

VASYL OSTROVSKYI, National Academy of Sciences of Ukraine, Institute of Mathematics

Introduction to compact quantum groups

ADAM SKALSKI, Institute of Mathematics of the Polish Academy of Sciences (IMPAN)

Operator algebras and non-local games

LYUDMYLA TUROWSKA, Chalmers University of Technology and University of Gothenburg

OTHER LECTURES

SLAVIK RABANOVICH, National Academy of Sciences of Ukraine, Institute of Mathematics

ORGANISERS

ADAM SKALSKI, Institute of Mathematics of the Polish Academy of Sciences (IMPAN)

LYUDMYLA TUROWSKA, Chalmers University of Technology and University of Gothenburg, Sweden

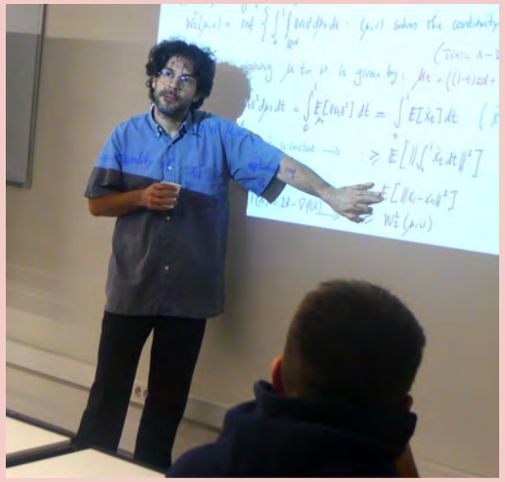
“The school was organized in a very professional way, in particular all the administrative aspects were taken care of by the ICMU staff, who at the same time consulted the organizing team, whenever necessary. Mathematically the background and interests of students were varied, but they all engaged with the lectures, asking questions, making relevant comments and enquiring about possible perspectives. The value of personal interactions — mainly with the junior participants, but also among the international and Ukrainian lecturers — cannot be overestimated, especially taking into account the fact that many of the participants are not currently able to travel outside of the country. The venue has facilitated these direct contacts also outside of the scheduled mathematical activities — during meals, hikes, evening chats at the outside fire. I am looking forward to further research interactions with Ukrainian colleagues and students.”

— Adam Skalski, School lecturer and organiser

LMS DISTINGUISHED VISITING FELLOWS

In November 2023 the London Mathematical Society committed £100,000 to support visits of established mathematicians to ICMU over the following 10 years. Professor Simon Salamon has joined the Scientific Board of ICMU as a representative of the LMS.

Through this newly established visitors' programme, scientists with recognized achievements in their disciplines can spend an extended period at ICMU, delivering a series of lectures or a colloquium for the benefit of the Ukrainian mathematical community and students. Each visitor is paired with a Ukrainian scientist as their host. In 2024, the Centre hosted three LMS Distinguished Visiting Fellows at its working space in Kyiv.



LONDON MATHEMATICAL SOCIETY
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LMS Distinguished Fellows Alex Iosevich, Augusto Gerolin, and Francis Brown lecturing at ICMU in Kyiv

Alex Iosevich (University of Rochester) was the first LMS Distinguished Visiting Fellow at ICMU. Professor Iosevich is a world-leading expert in harmonic analysis who has made significant contributions to both continuous and discrete Fourier analysis. Alex Iosevich spent his childhood in Lviv. Since 2010, Alex has been a professor at the University of Rochester in New York. His research interests include harmonic analysis, geometric measure theory, data science, neural networks, analytic number theory, and discrete geometry. Professor Iosevich is an excellent teacher and mentor and is constantly engaged in research projects with students. More than 20 PhD candidates have written theses under his guidance.

Alex Iosevich visited Ukraine on 22-28 September. He gave a series of lectures on harmonic analysis in Lviv and in Kyiv. His Ukrainian host was Rostyslav Hryniv, a professor at the Ukrainian Catholic University in Lviv.

Lectures of Alex Iosevich in Lviv (top) and Kyiv (bottom)

Augusto Gerolin (University of Ottawa, LMS Distinguished Visiting Fellow at ICMU) is a Canada Research Chair in Artificial Intelligence at the Interface of Chemistry and Mathematics. He is also an Assistant Professor jointly appointed to the Departments of Mathematics and Statistics, and of Chemistry and Biomolecular Sciences, at uOttawa. Professor Gerolin is a member of the European Laboratory for Learning and Intelligent Systems (ELLIS).

Augusto Gerolin taught a course on optimal transport and machine learning at an ICMU Summer School in Lviv in July. He also visited ICMU in Kyiv from October 14–17, delivering a series of lectures on the Mathematics of Machine Learning. This visit was hosted by Georgii Ryabov, President of the Kyiv Mathematical Society and senior researcher at the Institute of Mathematics of NASU.

In the summer of 2025, Augusto Gerolin, Georgii Ryabov, and their colleagues are organizing an ICMU Summer School on optimal transport and its applications. The idea to organize this school stemmed from Augusto Gerolin's first visit to ICMU.

Participants of the lecture course Mathematics of Machine Learning given by Augusto Gerolin at ICMU in Kyiv

Francis Brown (University of Oxford, LMS Distinguished Visiting Fellow at ICMU) is a professor of mathematics and a senior research fellow at All Souls College. His research interests cover various aspects of algebraic geometry and number theory, with applications to quantum field theory in mathematical physics.

Francis Brown visited Kyiv from 25 November to 2 December. His Ukrainian host was Masha Vlasenko, a professor at the Kyiv School of Economics and the Managing Director of ICMU. Professor Brown gave a series of accessible lectures at ICMU, introducing several themes at the crossroads of number theory and quantum physics. He also delivered a colloquium lecture on Voronoi diagrams, tropical curves, and the cohomology of the general linear group of integers. This lecture focused on the work of Ukrainian mathematician Georgy Voronyi from over a century ago, as well as its applications in recent research on the moduli space of tropical curves and abelian varieties. The lecture was aimed at students and presented these topics from a very concrete perspective.

Participants of the course "Elementary recurrences, graph polynomials, and values of the Riemann zeta function" given by Francis Brown in Kyiv in November

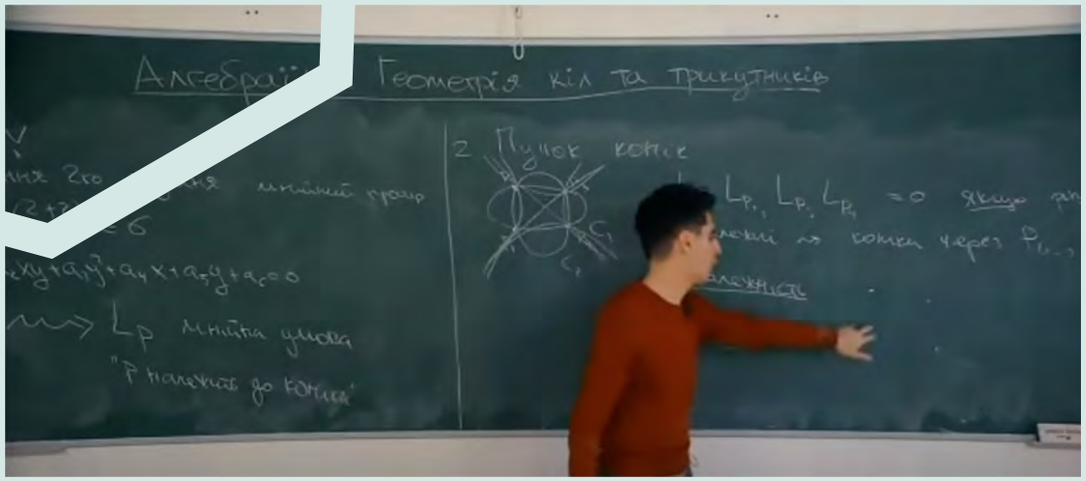
EDUCATIONAL AND OUTREACH PROGRAMME

For high school students, teachers and everyone interested in mathematics, ICMU organizes lectures in which professional scientists talk about objects and ideas of modern mathematics in an accessible language. Lectures in Ukrainian are encouraged.

This year started with a course of lectures “Algebraic geometry of circles and triangles” by **Borys Kadets** (Hebrew University of Jerusalem). The first lecture on 29 February was dedicated to the inauguration of the working space of ICMU in Kyiv.

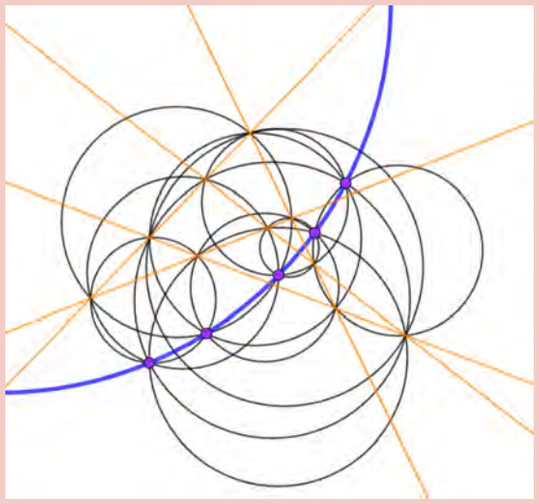
Borys Kadets shared with the participants several stories illustrating how algebraic methods help solve classical problems of Euclidean geometry rather easily. The purpose of his course was to provide a gentle introduction to algebraic geometry that does not require difficult techniques, which are usually necessary even for an initial acquaintance with the field. The only prerequisite was not to be afraid of the words "complex numbers" and "projective plane".

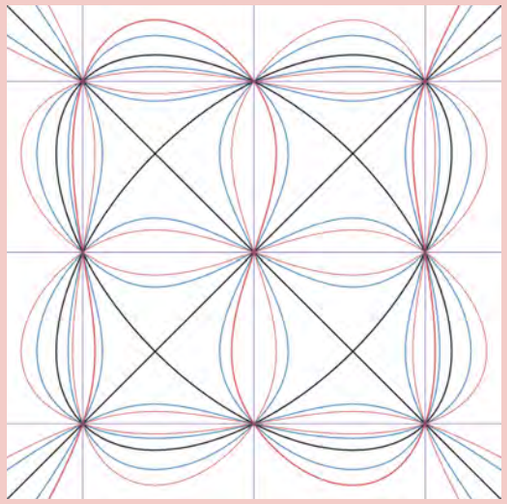
Over 100 participants, 50% on-site



Borys Kadets giving a remote lecture at ICMU in March

Borys Kadets works in algebraic geometry and number theory. He completed his undergraduate studies at V.N. Karazin Kharkiv National University. In 2020, he defended his doctoral dissertation at the Massachusetts Institute of Technology (USA). Since 2023, Borys has been a senior lecturer at the Hebrew University of Jerusalem.





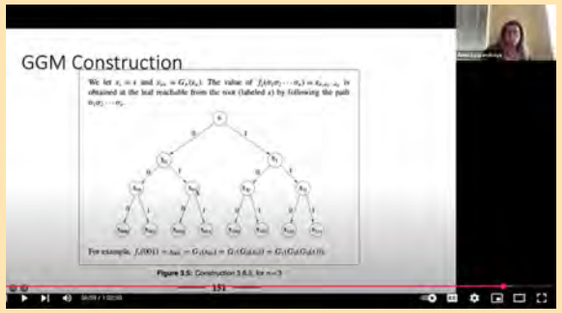
Drawings by Borys Kadets on the topic of his course of algebraic geometry of circles and triangles

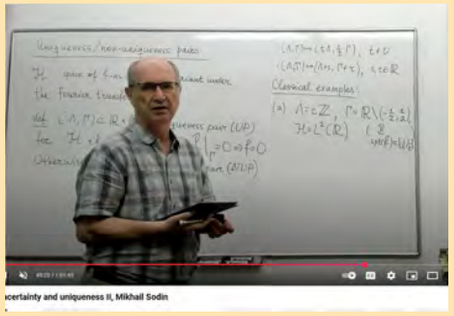
Discussion after the lectures at the working space of ICMU

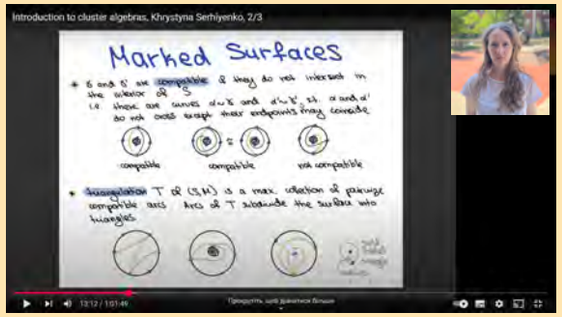
ONLINE MINI-COURSES

ICMU organizes short online mini-courses on various topics in the mathematical sciences. These mini-courses are designed for undergraduate and graduate students, well-prepared high schoolers, and other interested participants. Each mini-course includes homework, graded by a course assistant. The names of students and other attendees who successfully complete the mini-courses are published on the ICMU website.

This year, we held three courses from 24 to 28 June and one course from 23 to 30 September. A total of 20 participants successfully completed the homework assignments for at least one course, with 11 receiving a distinction.







LECTURE COURSES

Foundations of cryptography: minicrypt, cryptomania, and beyond

ANNA LYSYANSKAYA, Brown University

Teaching assistant: **ILLIA MELNYK,** Kyiv Polytechnic Institute

Cluster algebras, T-systems and Zamolodchikov periodicity

PAVLO PYLYAVSKYY, University of Minnesota

Teaching assistant: **SYLVESTER ZHANG,** University of Minnesota

Introduction to cluster algebras

KHRYSTYNA SERHIYENKO, University of Kentucky

Teaching assistant: **DANIEL SOSKIN,** Lehigh University

Fourier uncertainty and uniqueness

MIKHAIL SODIN, Tel-Aviv University

Teaching assistant: **OREN YAKIR,** Tel Aviv University

ORGANISERS

ANDREY GOGOLEV, The Ohio State University

OLEKSII KLURMAN, Bristol University

OLEKSANDR TSYMBALIUK, Purdue University

ICMU STUDENT RESEARCH AWARD

The award is intended to recognize the best defended thesis or student research papers in the mathematical sciences that led to a publication. The competition is open to students who are enrolled in Bachelor's or Master's degree programmes in a Ukrainian higher education institution. The winners are given a one-time cash prize which amounts to 50,000 UAH in 2024. Several awards are planned to be presented each year.

In 2024 the Award Selection Committee consisted of the following mathematicians:

DMITRI FINKELSHTEIN
Swansea University

OLEKSIY KAPUSTYAN
Taras Shevchenko National University of Kyiv

EUGENE KAROLINSKY
V. N. Karazin Kharkiv National University

OLHA KICHMARENKO
I. I. Mechnikov Odesa National University

OLHA MARTYNYUK
Yuriy Fedkovych Chernivtsi National University

VOLODYMYR NEKRASHEVYCH
Texas A&M University

DMYTRO SAVCHUK
University of South Florida

LYUDMYLA TUROWSKA
Chalmers University of Technology and University of Gothenburg

MICHAEL ZARICHNYI
Ivan Franko National University of Lviv

More than 20 university students from across Ukraine participated in the competition for the ICMU Student Research award. Six prizes were awarded.

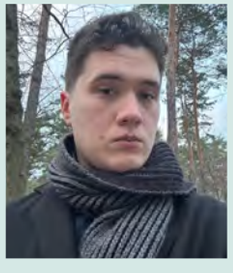
YEHOR AVDIEIEV for the paper "Affine Standard Lyndon Words: A-Type," published in International Mathematical Research Notices (co-authored with Alexander Tsymbaliuk). Yehor is a student of the Faculty of Mathematics and Informatics at V. N. Karazin Kharkiv National University and of the Faculty of Mathematics at the University of Bonn

RUSLAN BARKOV for the paper "A Riemann–Hilbert Approach to Solution of the Modified Focusing Complex Short Pulse Equation," published in Frontiers in Applied Mathematics and Statistics (co-authored with Dmitry Shepelsky). Ruslan is studying at the Faculty of Mathematics and Informatics of V. N. Karazin Kharkiv National University.

ARTEM HAK for his master's thesis "Unique eccentric point graphs" defended at the National University of "Kyiv-Mohyla Academy." Currently Artem is a PhD student at the Kyiv-Mohyla Academy, where he is also teaching.

OLEKSII GALGANOV for the paper "Limit Theorems for Random Permutations with Weighted Cycles," published in Statistics & Probability Letters (co-authored with Andrii Ilienko). Oleksii was writing this work while being a student of the Faculty of Physics and Mathematics at Igor Sikorsky Kyiv Polytechnic Institute, where he is now continuing as a PhD student.

VALERIYA KOTELNIKOVA for the article "Small Counts in Nested Karlin's Occupancy Scheme Generated by Discrete Weibull-like Distributions," published in Stochastic Processes and Their Applications (co-authored with Alexander Iksanov). In 2024 Valeria graduated from master's programme at the Faculty of Computer Science and Cybernetics of Taras Shevchenko National University of Kyiv, and currently she is a PhD student at the University of California at Irvine.



VIKTOR CHUIKO for the article "Adomian Decomposition Method in the Theory of Nonlinear Periodic Boundary Value Problems with Delay," published in the proceedings of the 20th International Scientific Congress "Dynamical System Modeling and Stability Investigation" (co-authored with Sergey Chuiko and Peter Benner). Viktor is a student of the Faculty of Mechanics and Mathematics at Taras Shevchenko National University of Kyiv.

FINANCIAL REPORT 2024

INCOME

Donations

Anonymous	100,000 EUR
Individual donors	25,837 EUR

Event funding

University of Waterloo	2,764 EUR
Centre de Recherches Mathématiques (CRM), Montréal	3,297 EUR
CIMPA	1,849 EUR

ICMU is grateful to Maryna Viazovska, Andrey Gogolev, Wojciech J. Gajda, Eugene Pyvovarov & Lifeisgoodlabs OÜ, Oleksandr Tsymbaliuk, Piotr Achinger, Anonymous, Stephan Klaus, Karyna Nechyporuk and other individual donors.

ICMU is actively shaping the mathematical environment in Ukraine and enhancing international collaboration through summer and winter schools, lectures by distinguished visitors, and other activities that engage students and young scientists in active areas of modern mathematical research.

As an independent scientific institution, ICMU must seek diverse funding sources to ensure its continued operation and stable development. In particular, we are looking for funding to launch long-term visiting scholarships and thematic programmes. A thematic programme at ICMU is envisioned to last from one month to a full semester and to bring together world-leading experts in a chosen research area, along with young mathematicians interested in entering the field. These programmes will provide the infrastructure for a sustained presence of global mathematics in Ukraine. They are designed to generate novel fundamental ideas, train a new generation of scientists, and require stable, multi-year funding.

Mathematics lies at the heart of many critical domains — from cybersecurity and finance to technology and data analysis — and is essential to Ukraine's economic resilience, freedom, and sustainable development. By supporting our Centre, you help protect Ukraine's intellectual future and foster recovery and growth driven by knowledge — a contribution that will be internationally visible, as mathematics is a truly global science.

In-kind donations

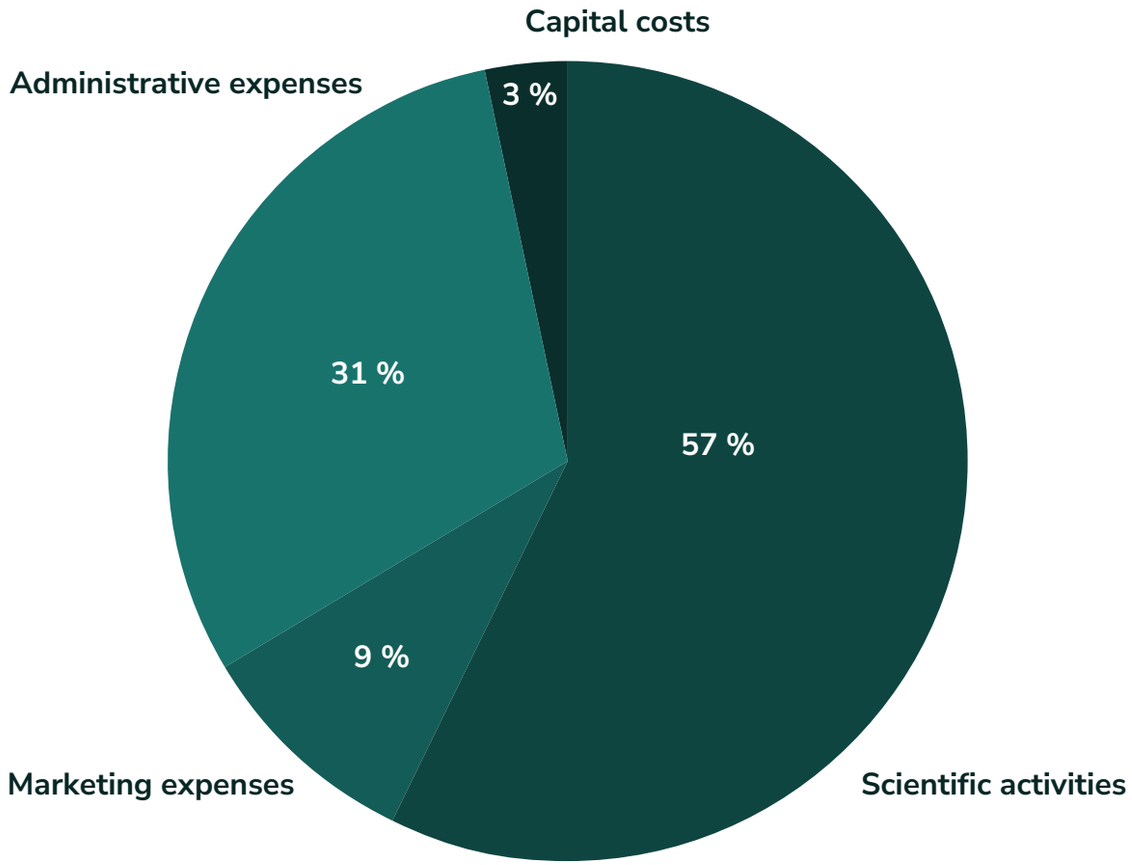
The ICMU extends its heartfelt gratitude to the **Kyiv School of Economics (KSE)** for providing us with a dedicated space on their campus and for their invaluable support in organizing our events. Until ICMU moves to its own building, this space serves as our home for research collaboration, academic programs, and public lectures. We deeply appreciate KSE's commitment to fostering mathematical research and education in Ukraine!

We sincerely thank the **German-Ukrainian Society Rhein-Neckar** for delivering a valuable collection of more than 2000 volumes of mathematics books **donated by Springer** to our Centre from Heidelberg to our Kyiv workspace. We deeply appreciate the efforts of everyone involved in making this possible: the **team of DUG Rhein-Neckar, Bohdan Savchynskyy (Heidelberg University), Catriona Byrne and Remi Lodh (Springer), and the charitable fund Vidomi from Dnipro.**

A special thank you to **Kostiantyn Iusenko**, a member of the ICMU Co-ordination Committee, who has taken full responsibility for organizing the developers' work on the ICMU website.

EXPENSES

Administrative expenses	**1,010,205 UAH**
Staff salaries	618,158 UAH
Accounting service	168,730 UAH
Bank fees and charges	26,330 UAH
Postal service	60,000 UAH
Business travel	86,303 UAH
Marketing expenses	**298,780 UAH**
Design, printed materials:	141,383 UAH
Merchandise:	157,398 UAH
Scientific activities	**1,902,600 UAH**
ICMU Summer/Winter Schools	1,480,238 UAH
Visitors programme	145,770 UAH
Collaboration groups	6,995 UAH
ICMU Student Research Award	256,575 UAH
ICMU online mini-courses	13,042 UAH
Capital costs	**101,750 UAH**
Web page development	96,493 UAH
Equipment	5,256 UAH
Total expenses of ICMU:	**3,313,350 UAH (circa 75,800 EUR)**



ICMU Summer School “Probability, geometry and machine learning” 14-21 July, Ukrainian Catholic University in Lviv

Total budget:	**542,246 UAH**
Local costs	307,848 UAH
Travel compensations for participants	6,790 UAH
Travel of lecturers and organisers	201,187 UAH
Materials	26,420 UAH
External funding:	**60% of total budget**
CRM Montreal	5,000 CAD
University of Waterloo - Women in Mathematics	2,000 USD
London Mathematical Society	1,140 GBP
CIMPA	754 EUR

ICMU Summer School “ATA XVI: sub-Riemannian geometry and optimal transport”, 29 July – 7 August, Kolochava, Ukraine

Total budget:	**450,900 UAH**
Local costs	355,136 UAH
Travel compensations for participants	21,477 UAH
Travel of lecturers and organisers	47,707 UAH
Materials	26,533 UAH
External funding:	**100% of total budget**
CIMPA	1100 EUR
Nova Ukraine	10,000 USD

ICMU Summer School “Operator algebras, quantum groups and quantum information theory”, 4-10 August, Babyn village, Ukraine

Total budget:	**236,758 UAH**
Local costs	189,852 UAH
Travel compensations for participants	7,902 UAH
Travel of lecturers and organisers	22,563 UAH
Materials	16,440 UAH