

ANDRII BOBROV

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Visiting Member, The Fields Institute for Research in Mathematical Sciences

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RESEARCH INTERESTS

Functional Analysis, Measure Theory, Partial Differential Equations, Optimal Transport Theory (Monge–Kantorovich and Beckmann formulations), and Infinite-Dimensional Probability.

ACADEMIC VISITS

The Fields Institute for Research in Mathematical Sciences Toronto, ON, Canada
Visiting Member (In-person) — Fully Funded Participant Jul 2026 – Present

- Selected for funded participation in the *Thematic Program on Optimal Transport* (travel & living support provided).
- Participating in advanced lecture series and participant-led working seminars on optimal transport.

EDUCATION

Kyiv Academic University (KAU) Kyiv, Ukraine
M.Sc. in Mathematics (Joint program with Institute of Mathematics, NAS of Ukraine) Sep 2025 – Expected Jun 2027

- Advisor:** Georgii Riabov

National Technical University of Ukraine “KPI” Kyiv, Ukraine
B.Sc. in Applied Mathematics (Institute of Physics and Technology – IPT) Sep 2021 – Jun 2025

- GPA:** 92/100.
- B.Sc. Thesis:** *Optimal Transport on Graphs and the Beckmann Problem* (Advisor: Georgii Riabov).
- Established equivalence between W_1 optimal transport plans and Beckmann minimal flow problem on graphs; analyzed constructive flow-decomposition algorithms.

RESEARCH EXPERIENCE

Variational Formulations of the Monge–Kantorovich Problem in Banach Spaces
Master’s Thesis Research (Joint work with G. Riabov) Sep 2025 – Present

- Setup:** Investigating minimal L^1 -norm vector fields satisfying $-\operatorname{div}(u\mu) = \rho\mu$ for probability measures satisfying a Poincaré inequality (extending the Beckmann continuous transport formulation).
- Finite-Dimensional Results:** Established strong duality and existence of minimizers via Fenchel–Rockafellar duality on $C_0^1(\mathbb{R}^n)$; proved alignment of the polar decomposition $dU^* = \sigma \nabla w^*$ via mollification; established uniqueness via transport ray disintegration.
- Infinite-Dimensional Extension:** Currently investigating ray regularity and disintegration on separable Banach spaces equipped with centered probability measures, studying generalized Cameron–Martin-type embeddings $\mathcal{H}_2$ following Cavalletti’s approach on Wiener spaces.

MANUSCRIPTS IN PREPARATION & WORK IN PROGRESS

- A. Bobrov, G. Riabov, *Variational Formulations of the Monge–Kantorovich Problem: Duality and Transport Ray Disintegration*** (provisional title), manuscript in preparation.

TALKS & PRESENTATIONS

- Kantorovich–Rubinstein Distance on Gaussian Spaces**, presented at:
 - The Skorokhod Readings* (Online), Institute of Mathematics of NAS of Ukraine, Jun 2026.
 - International Conference of Young Mathematicians* (Online), Institute of Mathematics of NAS of Ukraine, Jun 2026.
- Barycenters in Wasserstein Space: Local Geometry and Parametric Convergence**, *KAU Mathematics Research Seminar*, Kyiv Academic University, Apr 2026.
- Variational Formulations of Optimal Transport in Banach Spaces**, *Optimal Transport Seminar*, The Fields Institute, Toronto, Canada (Scheduled: Sep–Oct 2026).

HONORS & ACADEMIC AWARDS

- Fields Institute Visiting Support**, Thematic Program on Optimal Transport 2026
- State Academic Excellence Scholarship**, KPI IPT (awarded to top 10% of students by GPA) 2021 – 2025

SELECTED ADVANCED COURSEWORK

Geometry & Topology: Lie Groups, Symmetries of Differential Equations, Algebraic Topology, Ergodic Theory, Topological Dynamics.

LANGUAGES

Ukrainian: Native | **English:** Professional working proficiency | **Japanese:** Intermediate / Conversational (~N3)
| **Russian:** Native