



# Bohdan Bulanyi

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## Personal information

Born Zaporijjia (Ukraine), 5 September, 1994  
Nationality Ukraine  
Address Università di Bologna,  
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## Positions

2024–2025 **Postdoctoral researcher**, Università di Bologna, Bologna, Italy, Advisor Prof. Berardo Ruffini  
2021–2024 **Postdoctoral researcher**, Université catholique de Louvain, Louvain-la-Neuve, Belgium, Advisor Prof. Jean Van Schaftingen

## Education

2018–2021 **Ph.D. in Mathematics, Mention: Très honorable**, Université Paris Cité, Laboratoire Jacques-Louis Lions, Paris, Title of the thesis: Regularity for optimal compliance problems with length penalization, Advisor: Prof. Antoine Lemenant  
Defended on September 24, 2021  
2016–2018 **Master Degree in Mathematics, Mention: Très bien, ranked 1st**, Université de Toulon, Toulon, Title of the thesis: A variant of the Wasserstein distance and time formulation of the associated transport problem, Advisors: Prof. Guy Bouchitté and Prof. Thierry Champion  
2013–2017 **Bachelor Degree in Mathematics, with distinction**, Taras Shevchenko National University of Kyiv, Kyiv, Specialization: Mathematical Analysis

## Research interests

- Calculus of variations
- Partial differential equations

- Harmonic analysis
- Geometric measure theory
- Anisotropic variational problems
- Sobolev mappings between manifolds
- Regularity theory
- Optimal transport
- Optimization, Homogenization, Inverse problems

## Scientific papers

- Regularity for the planar optimal  $p$ -compliance problem, joint with A. Lemenant, **ESAIM Control Optim. Calc. Var.**, 27:35, 2021
- On the importance of the connectedness assumption in the statement of the optimal  $p$ -compliance problem, **J. Math. Anal. Appl.**, 499:125064, 2021
- Partial regularity for the optimal  $p$ -compliance problem with length penalization, **Calc. Var. Partial Differential Equations**, 61:11, 2022
- Singular extension of critical Sobolev mappings under an exponential weak-type estimate, joint with J. Van Schaftingen, **J. Funct. Anal.**, 288:110681, 2025
- On the equivalence of static and dynamic weak optimal transport, **submitted**, **arXiv:2311.13872**, 2023
- Limiting behavior of minimizing  $p$ -harmonic maps in 3d as  $p$  goes to 2 with finite fundamental group, joint with J. Van Schaftingen and B. Van Vaerenbergh, **Arch. Ration. Mech. Anal.**, 249(3), 1-103, 2025
- Threshold dynamics approximation schemes for anisotropic mean curvature flows with a forcing term, joint with B. Ruffini, **submitted**, **arXiv:2501.10341**, 2025

## Qualifications

2024-2027 **Maître de conférences**, Sections 25, 26

## Teaching

2018–2019 **Differential equations (teaching assistant)**, L2 Biology, Université Paris Diderot (fall)

2018–2019 **Numerical analysis (teaching assistant)**, L2 Mathematics, Université Paris Diderot (spring)

2018–2019 **Colloquia on calculus and linear algebra**, L1 and L2 Mathematics, Université Paris Diderot (spring)

2019–2020 **Numerical analysis (teaching assistant)**, L2 Mathematics, Université Paris Diderot (fall)

2019–2020 **Colloquia on calculus and linear algebra**, L1 and L2 Mathematics, Université Paris Diderot (spring)

2020–2021 **Calculus and linear algebra**, L1 Chemistry, Université de Paris (fall)

2020–2021 **Tutoring in analysis and linear algebra**, L1 Mathematics, Université de Paris (spring)

## Reviewing

Referee for “Ricerche di Matematica”

## Invited talks at seminars and conferences

- June 2019 **ANR SHAPO meeting**, Montpellier, France
- August 2019 **Workshop VIII PDE, optimal design and numerics**, Benasque, Spain
- Nov. 2019 **Séminaire du GT Thésards du LJLL**, Sorbonne Université, Paris, France
- Oct. 2019 **Poster at the conf. Shape Optim. (JOFA 4)**, l'École polytechnique
- Nov. 2019 **Poster at the conf. Modélisation, Analyse et Simulation (LJLL50)**, Paris
- Oct. 2020 **Video-talk at Seminar on Calculus of Variations (GT CalVa)**, Paris, France
- June 2021 **Congress SMAI 2021**, la Grande-Motte, France
- Sep. 2022 **Poster at Summer school on Analysis, Applied Math.**, Universität Münster
- Nov. 2022 **UCLouvain Analysis seminar**, Louvain-la-Neuve, Belgium
- April 2024 **Seminario di Analisi Matematica**, Università di Bologna, Italy
- Nov. 2024 **Analysis Seminar**, Università di Pisa, Italy
- Nov. 2024 **Séminaire EDP et Applications**, Institut Elie Cartan de Lorraine, Nancy, France
- Dec. 2024 **Séminaire Analyse Harmonique**, Université Paris-Saclay, Orsay, France
- April 2025 **Seminar on Calculus of Variations (GT CalVa)**, Université Paris Dauphine-PSL

## Participation to Workshops, Schools and Courses

- Dec. 2018 **Journées ANR SHAPO - Shape Optimization**, Grenoble, France
- Feb. 2019 **Winter school on Calculus of Variations and Probability**, Toulouse, France
- June 2019 **Journées ANR SHAPO - Shape Optimization**, Montpellier, France
- June 2019 **Journée CalVa, conf. for the 50th anniversary of the LJLL**, Paris France
- August 2019 **VIII PDE, optimal design and numerics**, Benasque, Spain
- Oct. 2019 **Journées Optimisation de Formes et Applications**, Palaiseau, France
- Nov. 2019 **Modeling, analysis and simulation, 50th anniversary of the LJLL**, Paris France
- August 2020 **A Simons Collaboration on Localization of Waves Virtual Workshop**
- June 2021 **Congress SMAI 2021**, la Grande-Motte, France
- July 2022 **Calculus of Variations in Lille**, Lille France
- Sept. 2022 **Summerschool on Analysis and Applied Mathematics**, Münster, Germany
- Dec. 2022 **Calculus of Variations in Nancy**, Nancy, France
- June 2023 **Calculus of Variations and Applications in Paris**, Paris, France
- June 2023 **Geometrical trends in applied analysis**, Mulhouse, France
- Dec. 2023 **Journée de Contact FNRS ULB-UCLouvain (Analysis and PDEs)**, Louvain-La-Neuve, Belgium

- Nov. 2024 **Rencontre à Nancy sur le thème des Varifolds**, Nancy, France  
Jan. 2025 **Winter School on Variational and PDE's Methods in Geometric Analysis**, Rome, Italy

## Experience

- Fall 2016 **Practical training on methods of calculation in Matlab**, 4 weeks, Taras Shevchenko National University of Kyiv  
Spring 2018 **Internship at Université de Toulon, Laboratoire IMATH**

## Fellowships

- 2013-2017 Taras Shevchenko National University of Kyiv Fellowship  
2016-2017 Campus France Fellowship  
2018 IMATH Laboratory Fellowship, Université de Toulon  
2018-2021 Contrat doctoral, Université Paris-Diderot, Laboratoire Jacques-Louis Lions  
2021-2024 Bourse UCLouvain: funding from Projet de Recherche T.0229.21 of FNRS  
2024-2025 PRIN "Nodal Optimization, Nonlinear elliptic equations, Nonlocal geometric problems: focus on anisotropic variational problems and regularity"

## Scientific visits

- April 2024 Università di Bologna. Invited by Prof. Berardo Ruffini and Prof. Eleonora Cinti  
Nov. 2024 Institut Elie Cartan de Lorraine. Invited by Prof. Antoine Lemenant

## Languages

- English fluent  
French fluent  
Italian basic  
Russian mother tongue  
Ukrainian mother tongue

## Computer skills

- Matlab, -good knowledge  
Python  
C, C++ -good knowledge