

Michał Borowski

CURRICULUM VITAE

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Personal data

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Google Scholar: <https://scholar.google.com/citations?user=WjZYO7QAAAAJ&hl=pl>

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Education

10.2023 - now **Phd studies in Mathematics**
Warsaw Doctoral School of Mathematics and Computer Science
Supervisor: dr hab. Iwona Chlebicka, prof. UW
Second supervisor: dr hab. Błażej Miasojedow, prof. UW

10.2022 - now **Master's studies in Mathematics**
University of Warsaw

10.2021 - 09.2023 **Master's studies in Computer Science**
University of Warsaw
Graduated with honors
Thesis title: „Convergence of projected stochastic approximation algorithm”
Supervisor: dr hab. Błażej Miasojedow, prof. UW

10.2019 - 07.2022 **Bachelor's studies in Mathematics**
University of Warsaw
Graduated with honors
Thesis title: „Boundedness of Wolff-type potentials and solutions to problems with irregular data”
Supervisor: dr hab. Iwona Chlebicka, prof. UW

10.2018 - 07.2021 **Bachelor's studies in Computer Science**
University of Warsaw
Thesis title: „Automated freight exchange platform”
Supervisor: mgr Paweł Gora

Publications

- Preprint **„Smoothness of weight sharply discards Lavrentiev's gap for double phase functionals”**
Michał Borowski
arXiv:2509.06567
- Preprint **„Composition operators in Orlicz-Sobolev spaces”**
Michał Borowski, Andrea Cianchi
arXiv:2505.09182
- Preprint **„Convergence of projected stochastic approximation algorithm”**
Michał Borowski, Błażej Miasojedow
arXiv:2501.082565
- Preprint **„Discarding Lavrentiev's Gap in Non-autonomous and Non-Convex Variational Problems”**
Michał Borowski, Pierre Bousquet, Iwona Chlebicka, Benjamin Lledos, Błażej Miasojedow
arXiv:2410.14995
- 2024 **„Absence of Lavrentiev's gap for anisotropic functionals”**
Michał Borowski, Iwona Chlebicka, Błażej Miasojedow
Nonlinear Anal. 246 (2024): 113584
10.1016/j.na.2024.113584
- 2023 **„Absence and presence of Lavrentiev's phenomenon for double phase functionals upon every choice of exponents”**
Michał Borowski, Iwona Chlebicka, Filomena De Filippis, Błażej Miasojedow
Calc. Var. Partial Differential Equations 63, no.2 (2024): 1–23
10.1007/s00526-023-02640-1
- 2023 **„Boundedness of Wolff-type potentials and applications to PDEs”**
Michał Borowski, Iwona Chlebicka, Błażej Miasojedow
Nonlinear Anal. Real World Appl. 76 (2024): 104025
10.1016/j.nonrwa.2023.104025
- 2022 **„Modular density of smooth functions in inhomogeneous and fully anisotropic Musielak-Orlicz-Sobolev spaces”**
Michał Borowski, Iwona Chlebicka
Journal of Functional Analysis 283. 12(2022): 109716
10.1016/j.jfa.2022.109716
- 2022 **„Controlling monotonicity of nonlinear operators”**
Michał Borowski, Iwona Chlebicka
Expositiones Mathematicae 40. 4(2022): 1159-1180
10.1016/j.exmath.2022.07.002
- 2020 **„New Hybrid Quantum Annealing Algorithms for Solving Vehicle Routing Problem”**
Michał Borowski, Paweł Gora, Katarzyna Karnas, Mateusz Błajda, Krystian Król, Artur Matyjasek, Damian Burczyk, Miron Szewczyk, Michał Kutwin
Computational Science – ICCS 2020. Springer International Publishing, 2020
10.1007/978-3-030-50433-5_42

Grants

- 05.2025-05.2028 **Niestandardowe techniki analizy funkcjonalnej i rachunku wariacyjnego**
(Non-standard techniques of Functional Analysis and Calculus of Variations)
MNiSW grant, Perły Nauki II PN/02/0001/2023

Talks

- 05.11.2025 **„Smoothness of weight sharply discards Lavrentiev’s gap for double phase functionals”**
Nonlinear Partial Differential Equations in Salzburg 2025, Salzburg, Austria
<https://simon-blatt.github.io/Salzburg2025/>
- 24.06.2025 **„Approximation in Variational Problems”**
Workshop: Novel methods of PDEs and function spaces, MIMUW, Warsaw
<https://evolutionarypdes2025.icm.edu.pl/novel-methods/>
- 28.05.2025 **„Approximation in Variational Problems”**
CIME Summer School „Existence and regularity for non uniformly elliptic and parabolic problems under (p, q) and general growth conditions”, Montecatini Terme
<https://sites.google.com/unifi.it/cime/c-i-m-e-courses/c-i-m-e-courses-2025/existence-and-regularity-for-non-uniformly-elliptic-and-parabolic-problems?authuser=0>
- 21.11.2023 **„Lavrentiev’s phenomenon for double phase functionals”**
Conference „Lavrentiev’s phenomenon, approximation, and regularity”, MIMUW, Warsaw
<https://pde.icm.edu.pl/>
- 03.10.2023 **„Absence of Lavrentiev’s phenomenon”**
Conference „Young researchers in PDEs”, Instituto de Ciencias Matemáticas, Madrid
<https://sites.google.com/view/2023-period-pdes-icmat-uam/events/young-researchers-in-pdes>
- 02.02.2023 **„Absence of Lavrentiev’s phenomenon and Musielak-Orlicz-Sobolev spaces”**
Nonstandard Winter Day 2023, University of Warsaw, Warsaw
<https://www.mimuw.edu.pl/~ichlebicka/nonstandard-winter-day-2023.html>
- 10.11.2022 **„Boundedness of Wolff-type potentials”**
International Prague seminar on function spaces, Charles University, online
<https://www2.karlin.mff.cuni.cz/~slavikova/funspac.html>
- 07.09.2022 **„Boundedness of Wolff-type potentials and solutions to problems with irregular data”**
Workshop on Nonuniformly elliptic problems, IMPAN, Warsaw
<https://www.impan.pl/en/activities/banach-center/conferences/22-nep>

Organization of scientific events

- 20-22.11.2023 **„Lavrentiev’s phenomenon, approximation, and regularity”**
MIMUW, Warszawa
<https://pde.icm.edu.pl/>

Posters

- 09.09.2025 **„Absence of Lavrentiev's phenomenon”**
Workshop: Diffusion in Warsaw
MIMUW, Warsaw, 09-13.09.2025
<https://evolutionarypdes2025.icm.edu.pl/diffusion-in-warsaw/>
- 16.07.2025 **„Approximation in variational problems”**
Warsaw Summer School on Evolutionary PDEs
MIMUW, Warsaw, 13-18.07.2025
<https://evolutionarypdes2025.icm.edu.pl/summer-school/>
- 30.07.2024 **„Absence of Lavrentiev's phenomenon”**
Summer School on Geometric Analysis and PDEs
Będlewo Conference Center, 28.07-03.08.2024
<https://sites.google.com/impan.pl/geometric-analysis-pdes>
- 06.07.2024 **„Absence of Lavrentiev's phenomenon”**
KinMAT Summer School
Będlewo Conference Center, 01-06.07.2024
<https://sites.google.com/uw.edu.pl/kinmatsummerschool/home>
- 10.10.2023 **„Absence of Lavrentiev's phenomenon”**
Conference „Marvellous Event on Geometric Analysis”
Będlewo Conference Center, 08-13.10.2023
<https://mega2023.mimuw.edu.pl/>
- 04.07.2023 **„Absence of Lavrentiev's phenomenon”**
Summer school „Geometric analysis and PDEs”
European Center for Geological Education, Chęciny, 03-07.07.2023
<https://sites.google.com/view/checiny23/>
- 07.02.2023 **„Musielak-Orlicz-Sobolev spaces in absence of Lavrentiev's phenomenon for anisotropic functionals”**
Geometric and functional inequalities, function spaces and PDEs
Institute of Mathematics of the Czech Academy of Sciences, Prague
<https://geo.fi.muni.cz/>
- 16.05.2023 **„Musielak-Orlicz-Sobolev spaces in absence of Lavrentiev's phenomenon for anisotropic functionals”**
Summer school „Structured Population Models”
MIMUW, Warsaw, 15-19.05.2023
<https://pde.icm.edu.pl/>
- 27.11.2022 **„Musielak-Orlicz-Sobolev spaces in absence of Lavrentiev's phenomenon for anisotropic functionals”**
Polish Nationwide Students Conference of Mathematics „OMATKO”,
Wrocław University of Science and Technology, Wrocław
<http://prac.im.pwr.edu.pl/omatko/>

Awards and honors

2025	Scholarship for Preparing Outstanding Doctoral Dissertations 3rd edition, University of Warsaw, Initiative of Excellence https://inicjatywadoskonosci.uw.edu.pl/en/actions/iv-4-1/dissertations3/
2024	Scholarship "To Start" for PhD Students https://bpm.uw.edu.pl/en/scholarship-to-start-ii-edition/
2024	Marian Rejewski's Nationwide competition First award, edition 4, for Master's thesis in Computer Science https://im.p.lodz.pl/konkursy/ogolnopolski-konkurs-im-mariana-rejewskiego
2024	Polish Mathematical Society competition for the best student paper in probability theory and applications of mathematics Third award, edition 57 for Master's thesis in computer science https://www.ptm.org.pl/kategorie/konkursy/konkursy-studenckie/konkurs-prac-studenckich-z-rachunku-prawdopodobienstwa-i-zast
2023	Scholarship of Polish Minister of Education and Science for students with significant achievements
2023	Józef Marcinkiewicz competition for the best student paper in mathematics Third award, edition 67, for „Modular density of smooth functions in inhomogeneous and fully anisotropic Musielak-Orlicz-Sobolev spaces” https://www.ptm.org.pl/kategorie/konkursy/konkursy-studenckie/konkurs-prac-studenckich-z-matematyki-im-jozefa-marcinkiewicz
2023	Polish Mathematical Society competition for the best student paper in probability theory and applications of mathematics Honorable mention, edition 56, for Bachelor's thesis in mathematics https://www.ptm.org.pl/kategorie/konkursy/konkursy-studenckie/konkurs-prac-studenckich-z-rachunku-prawdopodobienstwa-i-zast
2019 - 2023	Rector's scholarship for best students 2019/2020 – Computer Science 2020/2021 – Mathematics 2022/2023 – Computer Science
2017 - 2018	Polish Olympiad in Informatics laureate of third degree

Visits

10.2025	4 weeks at University of Florence, work with prof. Andrea Cianchi Florence, Italy
08.2025	1.5 week at Aalto University, work with dr Leah Schätzler Helsinki, Finland
05.2025	1 week at University of Florence, work with prof. Andrea Cianchi Florence, Italy
02.2025	2.5 week at Aalto University, work with prof. Juha Kinnunen Helsinki, Finland
03-04.2023	1.5 week at University of Florence, work with prof. Andrea Cianchi Florence, Italy
02.2023	1 week at Université Toulouse III, work with prof. Pierre Bousquet and Benjamin Lledos Toulouse, France

Participation in scientific projects

10.2023 - now	Measure data problems NCN grant, Sonata Bis 2019/34/E/ST1/00120 Project manager: dr hab. Iwona Chlebicka, prof. UW https://projekty.ncn.gov.pl/en/index.php?projekt_id=453768
02.2023 - 07.2024	Convergence of stochastic approximation algorithm IDUB scholarship in statistics and applications of statistics Project's advisor: dr hab. Błażej Miasojedow, prof. UW https://inicjatywadoskonosci.uw.edu.pl/2022/05/stypendia-idub-dla-studentow-studiow-magisterskich-universytetu-warszawskiego-z-zakresu-statystyki-i-zastosowan-statystyki/
12.2021 - 11.2022	SNARTO NCBiR and ERC grant, programme "BRidge Alfa" https://erc.vc/portfolio_type/snarto/
10.2021 - 02.2023	Measure data problems NCN grant, Sonata Bis 2019/34/E/ST1/00120 Project manager: dr hab. Iwona Chlebicka, prof. UW https://projekty.ncn.gov.pl/en/index.php?projekt_id=453768
11.2020 - 11.2021	SNARTO ITS NCBiR grant, programme "Szybka ścieżka"
09.2020 - 07.2022	Szkoła Orłów MNiSW project Project manager: dr hab. Piotr Nayar Tutor: dr hab. Iwona Chlebicka, prof. UW http://tutoring.mimuw.edu.pl/index.xhtml
08.2019 - 11.2019	GLAD – Green Last Mile Delivery EIT Food grant Project manager: mgr Paweł Gora https://www.eitfood.eu/projects/glad-green-last-mile-delivery-a-more-sustainable-way-for-food-home-delivery-tailored-to-consumer-needs https://github.com/dwave-examples/D-Wave-VRP

Teaching

2024/2025

Ordinary differential equations I - Tutorials
University of Warsaw

2024/2025

Calculus for Bioinformatics - Tutorials
University of Warsaw

Research interests

PDEs, calculus of variations, measure theory, interpolation theory, functional analysis