

Paweł Stefan Goldstein

Education and scientific degrees

University of Warsaw:

- habilitation in *mathematics* 2019
habilitation project: *Niezmienniki topologiczne w analizie geometrycznej*
(*Topological invariants in geometric analysis*)
- PhD in *mathematics*, advisor: Tadeusz Mostowski 2005
thesis: *Potok gradientu funkcji harmonicznej w R^3*
(*Gradient flow of a harmonic function in R^3*)
- **Doctoral studies:** 2000-2005
Faculty of Mathematics, Informatics and Mechanics,
- M.Sc. in *mathematics*, *summa cum laude*
advisor: Tadeusz Mostowski 1999
thesis: *Geometria trajektorii gradientu funkcji analitycznej w C^2*
(*Geometry of gradient trajectories of an analytic function in C^2*)
- **M.Sc. studies:** 1994-1999
Faculty of Mathematics, Informatics and Mechanics
Inter-faculty Individual Studies in Mathematics and Natural Sciences

Employment

University of Warsaw, Faculty of Mathematics, Informatics and Mechanics

- Associate Professor 2019-
vice-Dean for student affairs 2019-2024
Director of studies for *Mathematics and Computer Science* 2024-
- Assistant Professor 2009-2019
- Teaching Assistant 2004-2009

Institute of Mathematics, Polish Academy of Science

- Assistant Professor 2014-2015

Scholarships and longer research visits

Institute of mathematics and statistics, University of Jyväskylä, Finlandia 2011-2012
Mobility Plus 1 year scholarship of the Polish Ministry of Science and Higher Education

**Mathematisches Institut,
Friedrich-Alexander Universität Erlangen-Nürnberg, Germany**
DAAD scholarship, research group of prof. Frank Duzaar 2005-2007

Grants and research projects

- as Principal Investigator

Metody topologiczne analizy geometrycznej (Topological methods in geometric analysis),
National Science Center (NCN) OPUS grant 2019/35/B/ST1/02030 2020-2025

Nieliniowe zagadnienia eliptyczne i subeliptyczne z krytyczną nieliniowością: konstrukcje funkcji próbnych i problem słabej domkniętości przestrzeni słabych rozwiązań
(*Nonlinear elliptic and subelliptic problems with critical nonlinearity: constructions of test functions and weak compactness of solutions*),
research project Mobility Plus no 603/MOB/2011/0
of Polish Ministry of Science and Higher Education 2011-2012

- as Participating Researcher

Metody i zagadnienia geometryczne w nieliniowych eliptycznych równaniach różniczkowych cząstkowych (Geometric methods and problems in nonlinear elliptic partial differential equations),
NCN grant Sonata BIS nr 2012/05/E/ST1/03232 2013-2018

Nonlinear pde's related to variational and geometric problems,
Foundation for Polish Science (FNP) grant Pomost BIS/2012-6/3 2013-2016

Nieliniowe równania cząstkowe: zagadnienia wariacyjne i geometryczne
(*Nonlinear partial differential equations: variational and geometric problems*)
Ministry of Science and Higher Education grant N N201 2009-2012

- as Organizer

Simons Semester in Geometric Analysis Jun-Jul 2026

Thematic Research Program *Geometric Analysis: Methods and Applications* GAMA25 Feb-Dec 2025
University of Warsaw's Excellence Initiative - Research University (IDUB)

Thematic Research Program *Geometric Analysis and PDEs* Feb-Dec 2024
University of Warsaw's Excellence Initiative - Research University (IDUB)

Recent publications

- Paweł Goldstein; Zofia Grochulska; Piotr Hajłasz *Gluing diffeomorphisms, bi-Lipschitz mappings and homeomorphisms*, submitted
- Paweł Goldstein; Zofia Grochulska; Piotr Hajłasz *Constructing diffeomorphisms and homeomorphisms with prescribed derivative*, Adv. Math.vol 460, Jan 2025, <https://doi.org/10.1016/j.aim.2024.110020>
- Paweł Goldstein; Zofia Grochulska; Chang-Yu Guo; Pekka Koskela; Debandjan Nandi *Characterizations of generalized John domains in R^n via metric duality*, Colloquium Mathematicum 176 (2024), 87-105
- Paweł Goldstein; Piotr Hajłasz *Smooth approximation of mappings with rank of the derivative at most 1*, Calc. Var. Partial Differential Equations 62 (2023), no. 3, Art. 88, 22 pp., <https://doi.org/10.1007/s00526-022-02408-z>
- Paweł Goldstein; Piotr Hajłasz *Jacobians of $W^{1,p}$ homeomorphisms, case $p=[n/2]$* , Calc. Var. Partial Differential Equations 58 (2019), no. 4, Art. 122, 28 pp., <https://doi.org/10.1007/s00526-019-1554-8>
- Paweł Goldstein; Piotr Hajłasz *C^1 mappings in R^5 with rank $Df \leq 3$ cannot be uniformly approximated by C^2 mappings with rank $Df \leq 3$* , J. Math. Anal. Appl. Volume 468, Issue 2, 15 December 2018, Pages 1108-1114, <https://doi.org/10.1016/j.jmaa.2018.08.060>
- Paweł Goldstein; Piotr Hajłasz; Pekka Pankka *Topologically nontrivial counterexamples to the Sard theorem*, International Mathematics Research Notices (2018), rny179, <https://doi.org/10.1093/imrn/rny179>

- Paweł Goldstein; Piotr Hajłasz *Topological obstructions to continuity of Orlicz-Sobolev mappings of finite distortion* Ann. Mat. Pura Appl. (2018). <https://doi.org/10.1007/s10231-018-0771-7>
- Paweł Goldstein; Piotr Hajłasz; Mohammad Reza Pakzad *Finite Distortion Sobolev Mappings between Manifolds are Continuous* Int. Math. Res. Not. IMRN 2019, no. 14, 4370–4391.
- Paweł Goldstein; Anna Zatorska-Goldstein *Uhlenbeck's decomposition in Sobolev and Morrey-Sobolev spaces* Results Math (2018) 73:71
- Paweł Goldstein; Piotr Hajłasz *Modulus of continuity of orientation preserving approximately differentiable homeomorphisms with a.e. negative Jacobian*. Ann. Acad. Sci. Fenn. Math., Vol 43 (2018), pp. 147–170.
- Paweł Goldstein; Piotr Hajłasz *A measure and orientation preserving homeomorphism of a cube with Jacobian equal -1 almost everywhere*. Arch. Ration. Mech. Anal. 225 (2017), no. 1, 65–88.

Organizational achievements

I co-organized 8 international conferences (including the Forum of Polish Mathematicians in Warsaw in 2016), a number of smaller conferences and workshops and 3 thematic sessions during the Polish Mathematical Society conventions. I co-organized a colloquium seminar for students of Doctoral Studies at the Mathematical Institute of the Polish Academy of Science.

I have been a board member of the Warsaw Branch of the Polish Mathematical Society for many years.

In the years 2019–2024, I have served as the vice-dean for students' affairs (head of the educational unit) of the Faculty of Mathematics, Informatics and Mechanics, the chairman of the Teaching Council for computer science, mathematics and computational engineering, and the vice-chairman of the Teaching Council for bioinformatics and systems biology. From 2024, I am the Director of studies of *Mathematics* and *Computer science* programmes at the University of Warsaw.

Didactic and popularizing achievements

I have conducted numerous classes at the University of Warsaw, including lectures on *Mathematical Analysis*, *Sobolev Spaces*, *Elements of Nonlinear Optimization*, *Mathematics and Statistics*, exercises and diploma seminars. I coordinated the work of student tutors as part of the commissioned studies project. I served as a member of the Faculty's Didactic Committee and as the departmental mobility coordinator. Until recently, as vice-Dean for student affairs, I was responsible for all the teaching activities organized by the Faculty.

I co-authored a guide for students *Jak pisać prace dyplomowe z matematyki?* (*How to write a diploma thesis in mathematics?*) (in Polish), book *Problems in Partial Differential Equations* (Problem Books in Mathematics, Springer 2019), and co-translated D. McQuarrie's *Mathematics for scientists and engineers* (III volumes); in 2006 the translation won a distinction in the Kuryłowicz contest for the best translation of scientific literature.

I conducted numerous popular lectures, workshops for the Polish Children's Fund (KFnrD), and for many years I had been involved in the organization of the Polish Mathematical Olympiad.

PhD students:

- Zofia Grochulska (PhD summa cum laude awarded in 2024, currently at University of Jyväskylä, Finland)
- Adam Grzela (since 2024)

I promoted two MA theses and 11 BA theses.

I was awarded Rector's Prize twice (2nd class, 2020, for research achievements, 1st class, 2024, for research and organizational achievements).