Curriculum vitae

Jakub Skrzeczkowski

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(a) Research experience

09.2023–08.2025: University of Oxford, postdoc in the ERC Advanced Grant of José A. Carrillo

01.2022–08.2023: LJLL, Sorbonne University, visiting PhD student, hosted by Benoît Perthame

03.2020–08.2020: LJLL, Sorbonne University, visiting PhD student, hosted by Benoît Perthame

10.2019–09.2023: Institute of Mathematics, Polish Academy of Sciences, PhD student with Piotr Gwiazda

03.2019–05.2019: Heidelberg University, visiting MSc student, hosted by Anna Marciniak-Czochra

(b) Education

19.06.2023	PhD in Mathematics (under supervision of Piotr Gwiazda), Institute of Mathematics, Polish Academy of Sciences
10.2017-08.2018	Erasmus Exchange MSc student, Hausdorff Center for Mathematics, Bonn, Germany
10.2017-09.2019	MSc in Mathematics, specialization in PDEs and analysis, University of Warsaw
10.2014-09.2017	BSc in Mathematics (interdisciplinary degree, 250 ECTS in Mathematics, Physics, Chemistry and Biology), University of Warsaw (MISMaP)
09.2010-05.2013	Academic High School, Nicolaus Copernicus University in Toruń, Poland

(c) Publications

1. P. Gwiazda, J. Skrzeczkowski, L. Trussardi. On the rate of convergence of Yosida approximation for the nonlocal Cahn-Hilliard equation. Accepted in *IMA Journal of Numerical Analysis*, preprint on *arXiv:2306.12772*.
2. C. Elbar, B. Perthame, J. Skrzeczkowski. Pressure jump and radial stationary solutions of the degenerate Cahn-Hilliard equation. *Comptes Rendus Mécanique* (in honour of Roland Glowinski), published online, doi: 10.5802/crmeca.173.
3. C. Düll, A. Marciniak–Czochra, P. Gwiazda, J. Skrzeczkowski. Structured Population Models on Polish Spaces: A unified approach including Graphs, Riemannian Manifolds and Measure Spaces to Describe Dynamics of Heterogeneous Populations. *Mathematical Models and Methods in Applied Sciences*, 34 (1), 109-143, 2024.
4. C. Elbar, M. Mason, B. Perthame, J. Skrzeczkowski. From Vlasov equation to degenerate nonlocal Cahn-Hilliard equation. *Communications in Mathematical Physics*, 401, 1033–1057, 2023.
5. B. Perthame, J. Skrzeczkowski. Fast reaction limit with nonmonotone reaction function. *Communications on Pure and Applied Mathematics*, 76 (7), 2023.
6. C. Düll, A. Marciniak–Czochra, P. Gwiazda, J. Skrzeczkowski. Measure Differential Equation with a nonlinear growth/decay term. *Nonlinear Analysis: Real World Applications*, 73, 2023 (art. 103917).
7. C. Elbar, J. Skrzeczkowski. Degenerate Cahn-Hilliard equation: From nonlocal to local. *Journal of Differential Equations*, 364, 576-611, 2023.

8. M. Bulíček, P. Gwiazda, J. Skrzeczkowski, J. Woźnicki. Non-Newtonian fluids with discontinuous-in-time stress tensor. *Journal of Functional Analysis*, 285 (2), 2023 (art. 109943).
9. P. Gwiazda, B. Miasojedow, J. Skrzeczkowski, Z. Szymańska. Convergence of the EBT method for a non-local model of cell proliferation with discontinuous interaction kernel. *IMA Journal of Numerical Analysis*, 43(1), 590-626, 2023.
10. M. Bulíček, P. Gwiazda, J. Skrzeczkowski. On a range of exponents for absence of Lavrentiev phenomenon for double phase functionals. *Archive for Rational Mechanics and Analysis*, 246, 209–240, 2022.
11. J. Skrzeczkowski. Fast reaction limit and forward-backward diffusion: a Radon-Nikodym approach. *Comptes Rendus Mathématique*, tome 360, p. 189-203, 2022.
12. Z. Szymańska, J. Skrzeczkowski, B. Miasojedow, P. Gwiazda. Bayesian inference of a non-local proliferation model. *Royal Society Open Science* 8: 211279, 2021.
13. C. Düll, A. Marciniak–Czochra, P. Gwiazda, J. Skrzeczkowski. Spaces of measures and their applications to structured population models. *Cambridge Monographs on Applied and Computational Mathematics*, ISBN: 9781316519103, Cambridge University Press, 2021.
14. M. Bulíček, P. Gwiazda, J. Skrzeczkowski. Parabolic equations in Musielak – Orlicz spaces with discontinuous in time N-function. *Journal of Differential Equations*, 290, 17-56, 2021.
15. A.S. Ackleh, N. Saintier, J. Skrzeczkowski. Sensitivity equation for measure-valued solutions to transport equations. *Mathematical Biosciences and Engineering*, 17(1), 514-537, 2020.
16. J. Skrzeczkowski. Measure solutions to perturbed structured population models - differentiability with respect to perturbation parameter. *Journal of Differential Equations*, 268 (8), 4119-4182, 2020.
17. M. Merski, J. Skrzeczkowski, J.K. Roth, M.W. Górna. A Geometric Definition of Short to Medium Range Hydrogen-Mediated Interactions in Proteins. *Molecules*, 25 (22), 5326, 2020.
18. M. Merski, K. Młynarczyk, J. Ludwiczak, J. Skrzeczkowski, S. Dunin-Horkawicz, M.W. Górna. Self-analysis of repeat proteins reveals evolutionarily conserved patterns. *BMC Bioinformatics*, 21, 179, 2020.

Preprints.

1. J.A. Carrillo, J. Skrzeczkowski. Convergence and stability results for the particle system in the Stein gradient descent method. Preprint on *arXiv:2312.16344*.
2. C. Elbar, B. Perthame, J. Skrzeczkowski. On the limit problem arising in the kinetic derivation of the Cahn-Hilliard equation. Preprint on *arXiv:2306.06486*.
3. C. Elbar, J. Skrzeczkowski. On the inviscid limit connecting Brinkman's and Darcy's models of tissue growth with nonlinear pressure. Preprint on *arXiv:2306.03752*.
4. C. Elbar, B. Perthame, A. Poiatti, J. Skrzeczkowski. Nonlocal Cahn-Hilliard equation with degenerate mobility: Incompressible limit and convergence to stationary states. Preprint on *arXiv:2305.06239*.
5. C. Elbar, P. Gwiazda, J. Skrzeczkowski, A. Świerczewska-Gwiazda. From nonlocal Euler-Korteweg to local Cahn-Hilliard via the high-friction limit. Preprint on *arXiv:2305.01348*.
6. J.A. Carrillo, C. Elbar, J. Skrzeczkowski. Degenerate Cahn-Hilliard systems: From nonlocal to local. Preprint on *arXiv:2303.11929*.

(d) PI in research projects

03.2022–02.2023: *Singular limits in parabolic equations*, Bekker 2021, cost: 115k PLN, funded by Natio-

nal Agency for Academic Exchange (Poland)

06.2020–05.2023: *Transport equation in modern theory of partial differential equations*, Preludium 18, cost: 90k PLN, funded by National Science Center (Poland)

(e) Honors, awards, prizes

10/2023: Marek Wacławek Prize (prize of the Director of the Institute of Mathematics of Polish Academy of Sciences for the PhD thesis with disctinction)

06/2023: Distinction in Juliusz Schauder Prize for young mathematicians for achievements in nonlinear analysis awarded by Schauder Center for Nonlinear Studies in Toruń, Poland (one prize and two distinctions were awarded for people up to 4 years after PhD)

02/2023: **Elected as a member of the European Mathematical Society Young Academy (EMYA)** (the EMS selected 30 members from mathematicians working in all areas of mathematics in Europe and being up to 5 years after PhD)

07/2022: **Scholarship for outstanding young researchers awarded by the Minister of Science of Poland** (17th edition, $\approx$ 200k PLN, only 5 in mathematics and only 1 for people before PhD)

05/2022: Scholarship START awarded by Foundation for Polish Science for young researchers (100 scholarships for reaserchers below 30 years old from all disciplines were awarded)

04/2022: **Kazimierz Kuratowski Prize for achievements in mathematics awarded jointly by Institute of Mathematics (Polish Academy of Sciences) and Polish Mathematical Society** (only one prize for people below 30 years old was awarded; considered as the most prestigious prize for young mathematicians in Poland)

03/2022: Prize for the best young polish mathematicians awarded by Polish Mathematical Society (only two such prizes for people below 27 years old were awarded)

12/2021: Scholarship of the President of the Polish Academy of Sciences for outstanding academic achievements (only 10 such scholarships are awarded among PhD students in all disciplines represented in the Academy)

04/2020: Special Prize in competition for best student thesis in mathematics *Step towards the future* funded by mBank (Poland)

02/2020: First Award in LIII Competition for best student paper in probability and applied mathematics, Polish Mathematical Society

08/2019: Eugeniusz Fidelis First Prize for best work presented by young mathematicians on 48th National Conference of Applied Mathematics

2012, 2013: Laureate title in 58th and 59th National Chemistry Olympiad

(f) Peer-reviewing activity

Reviewing papers for Communications in Partial Differential Equations (1), Journal of Mathematical Biology (1), Nonlinear Analysis: Real World Applications (1), European Journal of Applied Mathematics (1), IMA Journal of Applied Mathematics (1), Discrete and Continuous Dynamical Systems (1), Topological Methods in Nonlinear Analysis (1).

Verified peer-review information available at Web of Science profile.

(g) Organization of events

- Workshop *Crossing the borderlines in fluids and biology*, 12-16.06.2023, Chęciny, Poland (with M. Bulíček and A. Świerczewska-Gwiazda)
- Workshop *Recent Advances in Kinetic Theory and Fluid Dynamics Models* in honour of Claude Bardos, 8-12.08.2022, Banach Center, Warsaw (with P. Gwiazda, A. Świerczewska-Gwiazda, E. Titi)

(h) Shorter academic visits

- A. Tzavaras (KAUST, Saudi Arabia): 10.2023
- E. Zatorska (Imperial College, London): 03.2023
- M. Růžička, A. Kaltenbach (Freiburg): 12.2022
- L. Trussardi (Konstanz): 06.2022
- A. Marciniak-Czochra (Heidelberg): 10.2021, 07.2021, 07.2020, 02.2020
- M. Bulíček (Prague): 11.2022, 07.2022, 10.2019

(i) Selected invited talks at the conferences and seminars

Oct 2023: *Several derivations of the degenerate Cahn-Hilliard equation via singular limits*, seminar of Applied PDEs Group at KAUST, Saudi Arabia

Jul 2023: *Nonlocal-to-local limits for the degenerate Cahn-Hilliard equation*, workshop *Topics on neuroscience, collective migration and parameter estimation*, University of Oxford, UK

Jul 2022: *Bayesian inference of a non-local proliferation model*, conference in honor of Acta Numerica *30th Birthday of Acta Numerica*, Będlewo, Poland

Mar 2022: *Structured Population Models in the Spaces of Nonnegative Measures*, SIAM Conference on Analysis of PDEs, Berlin, Germany, talk at the session *Population dynamics: Individual-based and continuum models*

Feb 2022: *Fast reaction limit with nonmonotone reaction function*, conference *Mathematical challenges in modelling population dynamics*, LJLL, Paris

Oct 2021: *An improved range of exponents for absence of Lavrentiev phenomenon for double phase functionals*, Applied Analysis Seminar, Heidelberg University

Nov 2020: *Fast reaction limit with nonmonotone reaction function*, Multiscale Models for Complex Fluids: Modeling and Analysis (BIRS Workshop), Banff, Canada (online)

Dec 2019: *Measure solutions to perturbed structured population models - differentiability with respect to parameter*, SIAM Conference on Analysis of PDEs (PD19), La Quinta, US, invited talk at the session *Transport Equations - Mathematical Biology and Other Applications*

(j) Teaching (at University of Warsaw)

Student evaluations at `https://students.mimuw.edu.pl/~js357970/teaching.html`

WS + SS 22/23: Interdisciplinary Seminar on PDEs 3 (seminar, jointly with A. Świerczewska–Gwiazda)

WS + SS 21/22: Interdisciplinary Seminar on PDEs 2 (seminar, jointly with A. Świerczewska–Gwiazda)

WS + SS 20/21: Interdisciplinary Seminar on PDEs (seminar, jointly with A. Świerczewska–Gwiazda)

SS 20/21: Introduction to PDEs (tutorials, course for 3rd year students)

WS 20/21: Hyperbolic Conservation Laws (tutorials, course for 4-5th year and PhD students)

WS 20/21: Functional Analysis (tutorials, course for 3rd year students)

WS 19/20: Functional Analysis (tutorials, course for 3rd year students)