

Current Position

Since June 2018 Postdoctoral researcher at TU München in project B08 of SFB Transregio 109 with Marco Cicalese

Education

2015–2018 PhD in Applied Mathematics, Westfälische Wilhelms-Universität Münster
Thesis: Variational approximation of anisotropic free-discontinuity functionals
Advisor: Caterina Ida Zeppieri
Date of Doctoral's Degree: October 17, 2018
Grade: summa cum laude

2013–2015 M.Sc. in Mathematics, Westfälische Wilhelms-Universität Münster
Thesis: Linearized elasticity as Γ -limit of nonlinear discrete energies satisfying weak coerciveness conditions
Advisor: Caterina Ida Zeppieri
Date of certification: May 13, 2015
Grade: 1.0 (excellent)

2012–2015 M.Ed. in Mathematics and Latin Philology, Westfälische Wilhelms-Universität Münster
Date of certification: May 13, 2015
Grade: 1.6 (good)

2008–2012 B.Sc. in Mathematics, Westfälische Wilhelms-Universität Münster
Thesis: Darstellungen der reellen Heisenberggruppe
Advisor: Siegfried Echterhoff
Date of certification: March 12, 2012
Grade: 1.6 (good)

2008–2012 B.A. in Mathematics and Latin Philology, Westfälische Wilhelms-Universität Münster
Date of certification: July 23, 2012
Grade: 1.4 (very good)

2005–2008 Oberstufengymnasium in Eschwege
Abitur: June 5, 2008
Grade: 1.2 (very good)

Awards

2019/12 Dissertationspreis 2019 Westfälische Wilhelms-Universität Münster

Research Interests

calculus of variations, Γ -convergence, discrete-to-continuum variational analysis, free-discontinuity problems, anisotropic phase-transition problems

Talks at Conferences, Workshops, and Seminars (including upcoming)

- | | |
|---------|--|
| 2021/05 | Invited as a speaker for the Minisymposia “Asymptotic analysis of variational models in solid mechanics” and “Multiscale methods in materials science” at the SIAM conference, Bilbao |
| 2020/11 | Langenbach Seminar in Berlin
<i>Geometrically frustrated spin systems: The antiferromagnetic XY-model on the triangular lattice</i> |
| 2020/01 | Speaker at the Young Researcher’s Meeting during the 19th GAMM Seminar on Microstructures 2020, Freiburg
<i>Γ-convergence for energy-driven lattice systems</i> |
| 2019/11 | EDDy Seminar at RWTH Aachen
<i>Discrete-to-continuum variational analysis of lattice systems with bulk and surface scalings</i> |
| 2019/11 | Seminar at University Tor Vergata, Rome
<i>Discrete-to-continuum limits of multi-body systems with bulk and surface long-range interactions</i> |
| 2019/10 | Workshop “Calculus of Variations and Applications in Trani”
<i>Random finite-difference discretizations of the Ambrosio-Tortorelli functionals</i> |
| 2019/07 | Workshop “Calculus of Variations on Schiermonnikoog”
<i>Finite-difference discretization of the Ambrosio-Tortorelli functional on periodic and random lattices</i> |
| 2018/10 | Oberwolfach Workshop “Emergence of Structures in Particle Systems: Mechanics, Analysis and Computation”
<i>Finite-difference discretization of the Ambrosio-Tortorelli functional</i> |
| 2017/12 | Seminar at Osnabrück University
<i>Approximation of anisotropic free-discontinuity functionals via Γ-convergence</i> |
| 2016/11 | Seminar at University La Sapienza, Rome
<i>Anisotropic free-discontinuity functionals as the Γ-limit of second-order elliptic functionals</i> |

Seminars within the department

- | | |
|---------|---|
| 2020/12 | Joint Münster-München-Wien Calculus of Variations seminar
<i>Geometrically frustrated spin systems: Chirality transitions at the surface scaling</i> |
| 2019/01 | SFB Kolloquium Technische Universität München |

	<i>Finite-Difference Discretization of the Ambrosio-Tortorelli functionals</i>
2016/11	Oberseminar zur Analysis, Westfälische Wilhelms-Universität Münster <i>Second-order approximation of anisotropic free-discontinuity functionals</i>
2016/05	Oberseminar zur Analysis, Westfälische Wilhelms-Universität Münster <i>Second-order approximation of the anisotropic Mumford-Shah functional</i>

Participation in Schools and Workshops

2019/09	Workshop “New Trends in the Calculus of Variations” in Münster
2018/08	Workshop “New Trends in the Variational Modelling of Failure Phenomena” at the ESI of the University of Vienna
2018/02	Oberwolfach Workshop “Variational Methods for the Modelling of Inelastic Solids”
2017/06	Ninth Summer School in Analysis and Applied Mathematics, held at University La Sapienza, Rome
2016/06	PIRE-CNA Summer School “New Frontiers in Nonlinear Analysis for Material Sciences”, held at CMU, Pittsburgh
2016/02	Winterschool “Calculus of Variations in Physics and Materials Science”, held at the University of Würzburg
2015/05	Oberwolfach Seminar “Shapes and Patterns: Analysis and Simulations”

Research Visits

2020/08–09	Westfälische Wilhelms-Universität Münster (for 2 weeks) Host: Caterina Ida Zeppieri
2019/12	Westfälische Wilhelms-Universität Münster (for 4 days) Host: Caterina Ida Zeppieri
2019/11	University of Rome “Tor Vergata” (for 4 days) Host: Andrea Braides
2019/02	University of Rome “Tor Vergata” (for 3 days) Host: Andrea Braides
2018/10	Westfälische Wilhelms-Universität Münster (for 2 weeks) Host: Caterina Ida Zeppieri
2016/11	University of Rome “Tor Vergata” (for 4 days) Host: Andrea Braides

Teaching Experience

Summer term 2019	Lecturer for the course “Fine properties of Sobolev Functions” together with Marco Cicalese
------------------	---

Winter term 2017	Tutor for the course “Calculus of Variations”
Summer term 2017	Tutor for the course “Variational Modelling in Material Science”
Winter term 2016	Tutor for the course “Calculus of Variations”
Summer term 2016	Tutor for the course PDE I
Winter term 2015	Tutor for the course “Functional Analysis and PDE”
Summer term 2014	Tutor for the course PDE I (as student assistant)
Winter term 2013	Tutor for the course “Mathematics for Physicists I” (as student assistant)
Summer term 2012	Tutor for the course “Logical Foundations” (as student assistant)
Winter term 2011	Tutor for the course Analysis I (as student assistant)

Publications

A. Bach, M. Ruf, Fluctuation estimates for the multi-cell formula in stochastic homogenization of partitions, *preprint <https://cvgmt.sns.it/paper/5064/>* (2021).

A. Bach, R. Marziani, C. I. Zeppieri, Γ -convergence and stochastic homogenisation of singularly-perturbed elliptic functionals, *preprint arXiv: 2102.09872* (2021).

A. Bach, M. Cicalese, L. Kreutz, G. Orlando, The antiferromagnetic XY model on the triangular lattice: Topological Singularities, *preprint arXiv: 2011.10445* (2020).

A. Bach, M. Cicalese, L. Kreutz, G. Orlando, The antiferromagnetic XY model on the triangular lattice: Chirality transitions at the surface scaling, *preprint arXiv: 2004.01416* (2020).

A. Bach, M. Cicalese, M. Ruf, Random finite-difference discretizations of the Ambrosio-Tortorelli functional at optimal mesh size, *SIAM J. Math. Anal.*, to appear

A. Bach, A. Braides, M. Cicalese, Discrete-to-continuum limits of multi-body systems with bulk and surface long-range interactions, *SIAM J. Math. Anal.* **52**, no.4 (2020), 3600–3665.

A. Bach, A. Braides, C. I. Zeppieri, Quantitative analysis of finite-difference approximations of free-discontinuity functionals, *Interfaces Free Bound.* **22**, no. 3 (2020), 317–381.

A. Bach, L. Sommer, A Γ -convergence result for fluid-filled fracture propagation, *ESAIM Math. Model. Numer. Anal.* **54**, no. 3 (2020), 1003–1023.

A. Bach, Anisotropic Free-discontinuity Functionals as the Γ -limit of second-order elliptic Functionals, *ESAIM Control Optim. Calc. Var.*, **24**, no. 3 (2018), 1107–1140.

Autorizzo il trattamento dei dati personali contenuti nel presente curriculum vitae ai sensi del D.Lgs. 196/2003 “Codice in materia di protezione dei dati personali”

Autorizzo la pubblicazione del presente curriculum vitae sul portale di Ateneo “Amministrazione trasparente” in ottemperanza al D.Lgs. 33/2013 e al D.Lgs. 97/2016 e sul portale PERLAPA ai sensi del D.Lgs 165/2001.

Munich, 20.03.2021, Annika Bach