

FILIP RINDLER – CURRICULUM VITAE

WORK ADDRESS	Mathematics Institute Zeeman Building University of Warwick Coventry CV4 7AL, UK	F.Rindler@warwick.ac.uk http://www.warwick.ac.uk/filiprindler Tel.: +44 (0)24 765 28328 Office: Zeeman Building B2.20
PERSONAL INFORMATION	Date of birth: 15 August 1984 Citizenship: Austria	
RESEARCH INTERESTS	Partial Differential Equations, Geometric Measure Theory, Calculus of Variations, Mathematics of Material Science	
CURRENT POSITIONS	Jun 2020 –	Professor (Chair) , University of Warwick
PREVIOUS POSITIONS	2016 – 2021	Turing Fellow , Alan Turing Institute
	2018 – 2020	Reader , University of Warwick
	2016 – 2018	Associate Professor , University of Warwick
	2013 – 2016	Zeeman Lecturer (Assistant Professor) , University of Warwick
	2011 – 2015	Drosier Research Fellow (JRF) , Gonville & Caius College, University of Cambridge (on leave 2013–2015)
EDUCATION	2016	Fellowship of the Higher Education Academy
	2009 – 2011	DPhil (PhD) in Mathematics , OxpDE, University of Oxford Thesis title: <i>Lower Semicontinuity and Young Measures for Integral Functionals with Linear Growth</i> (supervisor: Prof. Jan Kristensen) (incl. 3-month visit to Carnegie Mellon University)
	2004 – 2008	Diplom in Mathematics (with distinction), TU Berlin Diploma Thesis: <i>Reverse approximation of rate-independent evolution processes</i> (supervisors: Prof. Alexander Mielke, Prof. Petra Wittbold) (incl. 6-month visit to University of Oxford)
	2004	Abitur , Sophie–Charlotte Oberschule, Berlin

AWARDS &
GRANTS

Total funding to date: ca. £2.2M / €2.5M / \$3M

- 2018 **LMS Whitehead Prize**
- 2018 – 2024 **ERC Starting Grant “SINGULARITY”** (PI, €1.5M, £1.2M)
- 2018 – 2021 **Lloyds Register Foundation grant in ATI/LRF DCE program**
(PI, ca. £300k)
- 2016 – **Turing Fellow**, Alan Turing Institute
- 2015/17/18 **Merit Award** (3x), University of Warwick
- 2015 **LMS Conference Grant**
- 2014 – 2017 **EPSRC Research Fellowship** (£262k)
- 2014 – 2015 **Royal Society International Exchange grant** (£5k) with PIMS, UBC,
Vancouver, Canada
- 2011 – 2015 **Drosier Research Fellowship** (£165k), Gonville & Caius College,
University of Cambridge
- 2009 – 2013 **EPSRC DPhil scholarship** (£70k), OxpDE, University of Oxford
- 2006 **Departmental Prize** from TU Berlin for the best “Vordiplom” in Com-
puter Science
- 2004 – 2009 **German Academic Scholarship Foundation Scholarship** (Studien-
stiftung des deutschen Volkes)
- 1996 – 2004 Several prizes at **Youth Science Competition** (Jugend forscht) and
from the **German Physical Society (DPG)**

INVITED TALKS

70+ research talks at international conferences, workshops, colloquia, research seminars, and schools in Europe, USA, Asia.

Selected recent talks:

- Sep 2019 Keynote talk at DEA 2019, Krakow, Poland
- Jul 2019 Oberwolfach workshop on “Partial Differential Equations”, Germany
- Oct 2018 Conference on “PDEs and Geometric Measure Theory”, FIM, ETH
Zurich, Switzerland
- Jul 2018 12th AIMS Conference on Dynamical Systems, Differential Equations
and Applications, Taipei, Taiwan
- Jul 2018 International Workshop on Critical Phenomena, NCTU, Hsinchu,
Taiwan
- Jul 2018 Conference on “Calculus of Variations and Geometric Measure Theory”,
University of Sussex, UK

BOOK *Calculus of Variations*, Springer, Universitext, 2018, 444 pages.

PUBLICATIONS ***Five selected publications are marked with a “★”.***

- *Elasto-plastic evolution of single crystals driven by dislocation flow* (with T. Hudson), submitted, arXiv:2109.08749.
- *Space-time integral currents of bounded variation*, submitted, arXiv:2109.12447.
- *Energetic solutions to rate-independent large-strain elasto-plastic evolutions driven by discrete dislocation flow*, submitted, arXiv:2109.14416.
- *Higher integrability for measures satisfying a PDE constraint* (with A. Arroyo-Rabasa, G. De Philippis, J. Hirsch, A. Skorobogatova), submitted, arXiv:2106.03077.
- *Shape optimization of light structures and the vanishing mass conjecture* (with J.-F. Babadjian, F. Iurlano), submitted, arXiv:2102.09911.
- *Probabilistic solution of chaotic dynamical system inverse problems using Bayesian Artificial Neural Networks* (with D. Green), submitted, arXiv:2005.13028.
- *Two-speed solutions to non-convex rate-independent systems* (with J. J. L. Velazquez, S. Schwarzacher), to appear in Arch. Ration. Mech. Anal., arXiv:1907.05035.
- ★ *Concentration versus oscillation effects in brittle damage* (with J.-F. Babadjian, F. Iurlano), to appear in Comm. Pure Appl. Math., arXiv:1906.02019.
- *On the relaxation of integral functionals depending on the symmetrized gradient* (with K. Kosiba), to appear in Proc. Roy. Soc. Edinburgh Sect. A, arXiv:1903.05771.
- *Fine properties of functions of bounded deformation – an approach via linear PDEs* (with G. De Philippis), to appear in special issue on “Variational models in elasticity”, AIMS Math. Eng. 2 (2020), 386–422.
- *Relaxation for partially coercive integral functionals with linear growth* (with G. Shaw), SIAM J. Math. Anal. 52 (2020), 4806–4860.
- *Model inference for ordinary differential equations by parametric polynomial kernel regression* (with D. Green), Proceedings of 3rd International Conference on Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP 2019), Crete, June 2019, 263-285.
- *Theme & variations on $\operatorname{div} \mu = \sigma$* , Oberwolfach Rep. 34/2019 (2019).
- ★ *Dimensional estimates and rectifiability for measures satisfying linear PDE constraints* (with A. Arroyo-Rabasa, G. De Philippis, J. Hirsch), Geom. Funct. Anal. 29 (2019), 639–658.
- *Liftings, Young measures, and lower semicontinuity* (with G. Shaw), Arch. Ration. Mech. Anal. 232 (2019), 1227–1328.
- *Lower semicontinuity and relaxation of linear-growth integral functionals under PDE constraints* (with A. Arroyo-Rabasa, G. De Philippis), to appear in Adv. Calc. Var. 13 (2020), 219–255, arXiv:1701.02230.

- *On the two-state problem for general differential operators* (with G. De Philippis, L. Palmieri), *Nonlinear Anal.* 177 (2018), 387–396
- *On the structure of measures constrained by linear PDEs* (with G. De Philippis), *Proc. ICM 2018*.
- *Regularity and approximation of strong solutions to rate-independent systems* (with S. Schwarzacher, E. Süli), *Math. Models Methods Appl. Sci. (M³AS)* 27 (2017), 2511–2556.
- *On Cheeger’s conjecture* (with G. De Philippis, A. Marchese), “*Measure Theory in Non-Smooth Spaces*” (Nicola Gigli, ed.), 2017, De Gruyter.
- *Characterization of generalized Young measures generated by symmetric gradients* (with G. De Philippis), *Arch. Ration. Mech. Anal.* 224 (2017), 1087–1125.
- ★ *On the structure of \mathcal{A} -free measures and applications* (with G. De Philippis), *Ann. of Math.* 184 (2016), 1017–1039.
- *Orientation-preserving Young measures* (with K. Koumatos, E. Wiedemann), *Q. J. Math.* 67 (2016), 439–466.
- *Piecewise affine approximations for functions of bounded variation* (with J. Kristensen), *Numer. Math.* 132 (2016), 329–346.
- *Differential inclusions and Young measures involving prescribed Jacobians* (with K. Koumatos, E. Wiedemann), *SIAM J. Math. Anal.* 47 (2015), 1169–1195.
- *Strictly continuous extension of functionals with linear growth to the space BV* (with G. Shaw), *Q. J. Math.* 66 (2015), 953–978.
- *Thin-film limits of functionals on \mathcal{A} -free vector fields* (with C. Kreisbeck), *Indiana Univ. Math. J.* 64 (2015), 1383–1423.
- ★ *Directional oscillations, concentrations, and compensated compactness via microlocal compactness forms*, *Arch. Ration. Mech. Anal.* 215 (2015), 1–63.
- *Differential inclusions and Young measures involving prescribed Jacobians*, *Proc. Appl. Math. Mech.* 14 (2014), 1049–1052.
- *A local proof for the characterization of Young measures generated by sequences in BV*, *J. Funct. Anal.* 266 (2014), 6335–6371.
- *Lower semicontinuity and Young measures in the space BD of functions of bounded deformation*, *Oberwolfach Rep.* 36/2012 (2012), 2247–2249.
- *Lower semicontinuity and Young measures in BV without Alberti’s Rank-One Theorem*, *Adv. Calc. Var.* 5 (2012), 127–159.
- ★ *Lower semicontinuity for integral functionals in the space of functions of bounded deformation via rigidity and Young measures*, *Arch. Ration. Mech. Anal.* 202 (2011), 63–113.
- *Lower Semicontinuity and Young Measures for Integral Functionals with Linear Growth*, DPhil thesis, University of Oxford, 2011.
- *Characterization of generalized gradient Young measures generated by sequences in $W^{1,1}$ and BV* (with J. Kristensen), *Arch. Ration. Mech. Anal.* 197 (2010), 539–598.

- *Relaxation of signed integral functionals in BV* (with J. Kristensen), *Calc. Var. Partial Differential Equations* 37 (2010), 29–62.
- *Approximation of rate-independent optimal control problems*, *SIAM J. Numer. Anal.* 47 (2009), 3884–3909.
- *Reverse approximation of energetic solutions to rate-independent processes* (with A. Mielke), *NoDEA Nonlinear Differential Equations Appl.* 16 (2009), 17–40.
- *Optimal control for nonconvex rate-independent evolution processes*, *SIAM J. Control Optim.* 47 (2008), 2773–2794.
- *Reverse Approximation of Rate-Independent Evolution Processes*, Diploma thesis (Diplomarbeit), Technical University Berlin, 2008.
- *On the Proper Interference Protection in Wireless Multi-hop Networks* (with M. Kubisch, E. Carlson, and D. Hollos), *Proceedings of the IEEE Wireless Communications and Networking Conference (WCNC) 2007*, Hong Kong, March 2007, 452–457.

RESEARCH
SUPERVISION

Postdocs:

- *David K. E. Green* (2018–2021)
- *Adolfo Arroyo-Rabasa* (2018–2021)
- *Bogdan Raita* (2018–2019)
- *Giacomo Del Nin* (2019–2022)
- *Paolo Bonicatto* (2020–2022)

PhD students:

- *Giles W. Shaw* (Cambridge, 2016)
- *Kamil Kosiba* (Warwick, 2019)

TEACHING

Lecture course “Advanced Real Analysis” (4th-year UG, Warwick, 2022)

Lecture course “Calculus of Variations” (4th-year UG, Warwick, 2015, 2017, 2019)

Lecture course “Complex Analysis” (3rd-year UG, Warwick, 2018)

Lecture course “Analysis of Linear PDEs” (PhD-level, Warwick, 2013)

Tutorials & mentoring for undergraduate students

12 Master students

SERVICE &
ADMINISTRATION

Associate Editor for *Math. Models Methods Appl. Sci. (M³AS)* from 2020.

Conference organization

- Special session on “*Analysis of Nonlinear PDEs and Applications*”, within AIMS 2021, 17-21 June 2021, Atlanta, USA.
- Mini-symposium on “*Concentration phenomena under PDE-constraints*”, within DEA 2019, 16–20 September 2019, Krakow, Poland.
- “*Recent Advances in PDEs and the Calculus of Variations*” (with G. De Philippis), 4-day research conference, 3–6 July 2017, Venice, Italy, funded by EPSRC, MIUR SIR.
- “*Variational Methods for Stationary and Evolutionary Problems*”, 1-day workshop,

12 May 2015, Warwick, UK, funded by LMS, EPSRC, Warwick.

Journal referee for the leading journals of the field (70+ papers)

Grant referee for ERC (EU), EPSRC (UK), SNF (Switzerland), FWF (Austria)

Co-organizer of departmental seminars (“PDEs and Applications”, “Geometric Analysis & PDEs”, “Geometric Measure Theory”)

Hiring panels for the selection of faculty and postdocs at Warwick

Member of Athena SWAN departmental committee at Warwick (2013–2016)

PhD examinations at Warwick, Oxford, Augsburg

Outreach talk “Bilton Lecture” (Mar 2017) at Bilton Grange School, Rugby, UK.

Admissions talk to prospective students

Member of LMS, EMS, GAMM