

## FILIP RINDLER – CURRICULUM VITAE

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RESEARCH                      Partial Differential Equations, Calculus of Variations, Geometric Measure Theory  
INTERESTS

EMPLOYMENT    2018 –                      **Reader**, *University of Warwick*  
  
                         2016 –                      **Turing Fellow**, *Alan Turing Institute*  
  
                         2016 – 2018                **Associate Professor**, *University of Warwick*  
  
                         2013 – 2016                **Zeeman Lecturer (Assistant Professor)**, *University of Warwick*  
  
                         2011 – 2015                **Drosier Research Fellow** (on leave from 2013)  
                                                         *Gonville & Caius College, University of Cambridge*

EDUCATION                      2016                      **Fellowship of the Higher Education Academy** via *PCAPP* (University teaching qualification), *University of Warwick*  
  
                         2010                      **Visiting scholar** (3 months) at the *Center for Nonlinear Analysis*, *Carnegie Mellon University, Pittsburgh, Pennsylvania, USA*  
  
                         2009 – 2011                **DPhil (PhD) in Mathematics** at *OxPDE, University of Oxford*  
                                                         Thesis title: *Lower Semicontinuity and Young Measures for Integral Functionals with Linear Growth* (with Prof. Jan Kristensen)  
  
                         2008                      **Research visitor** (6 months) at the *Oxford Centre for Nonlinear PDE (OxPDE), University of Oxford* (and *Magdalen College*)  
  
                         2004 – 2008                **Diplom in Mathematics with distinction** (grade 1.0)  
                                                         *Technical University Berlin*  
                                                         Diploma Thesis: *Reverse approximation of rate-independent evolution processes* (with Prof. Alexander Mielke)

AWARDS & GRANTS ( $\geq$ £5k)	2018	<b>LMS Whitehead Prize</b>
	2018 – 2023	<b>ERC Starting Grant “SINGULARITY”</b> (PI, €1.5M)
	2018 – 2021	<b>Lloyds Register Foundation grant in ATI/LRF DCE program</b> (PI, ca. £300k)
	2016	<b>Turing Fellow</b> , <i>Alan Turing Institute</i>
	2015, 2017	<b>Merit Award</b> , <i>University of Warwick</i>
	2014 – 2017	<b>EPSRC Research Fellowship</b> (£262k)
	2014 – 2015	<b>Royal Society International Exchange grant</b> (£5k) with <i>PIMS, UBC, Vancouver, Canada</i>
	2011 – 2015	<b>Drosier Research Fellowship</b> (£165k) from <i>Gonville &amp; Caius College, University of Cambridge</i>
	2009 – 2013	<b>EPSRC DPhil scholarship</b> (£70k) from <i>OxPDE</i>
	2006	<b>Departmental Prize</b> from the <i>Technical University Berlin</i> for the best “Vordiplom” (midway exam) in Computer Science
	2004 – 2009	<b>Scholarship</b> from the <i>German National Academic Foundation</i> (Studienstiftung des deutschen Volkes)
	1996 – 2004	Several prizes at <b>Youth Science Competition</b> (Jugend forscht) and from the <b>German Physical Society (DPG)</b>

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

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

PUBLICATIONS        **Relaxation for partially coercive integral functionals with linear growth** (with G. Shaw), submitted, arXiv:1806.00343.

**On the two-state problem for general differential operators** (with G. De Philippis, L. Palmieri), *Nonlinear Anal.*, to appear, arXiv:1803.09302

**On the structure of measures constrained by linear PDEs** (with G. De Philippis, arXiv:1712.08897.

                              \* **Liftings, Young measures, and lower semicontinuity** (with G. Shaw), submitted, arXiv:1708.04165.

**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.*, arXiv:1701.02230.

**Regularity and approximation of strong solutions to rate-independent systems** (with S. Schwarzacher, E. Süli), to appear in *Math. Models Methods Appl. Sci. (M<sup>3</sup>AS)*, arXiv:1702.01427.

**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.

**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, IEEE, Piscataway, March 2007, 452–457.

*Current selection of five publications for REF 2020/2021 are marked with “★”.*

SELECTED INVITED TALKS	Sep 2019	Conference on “Dynamics, Equations and Applications”, Krakow, Poland
	Oct 2018	Conference on “PDEs and Geometric Measure Theory”, FIM, ETH Zurich, Switzerland
	Sep 2018	Workshop ALEX2018 (Alex Mielke’s 60th birthday conference), Berlin, Germany
	Jul 2018	12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Teipei, Taiwan
	Jul 2018	International Workshop on Critical Phenomena, NCTU, Hsinchu, Taiwan
	Jul 2018	Conference on “Calculus of Variations and Geometric Measure Theory”, Sussex, UK
	May 2018	Workshop on Regularity Theory in Telč, Czech Republic
	May 2018	BIRS workshop on “Topics in the Calculus of Variations: Recent Advances and New Trends”, Banff, Canada
	Mar 2018	Oxbridge PDE Conference, Cambridge, UK
	Feb 2018	RWTH Aachen, Germany
	Oct 2017	University of Bonn, Germany
	Sep 2017	University of Sussex, UK
	Jul 2017	Workshop on “Geometric measure theory”, Warwick, UK
	Apr 2017	University of Basel
	Dec 2016	Geometric PDEs workshop, Warwick, UK
	Oct 2016	Workshop on GMT, Shape Optimisation and Free Boundaries, SISSA, Trieste, Italy
	Jul 2016	11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA
	Jun 2016	IST Austria
	May 2016	University of Bath, UK

Apr 2016 University of Regensburg, Germany

Apr 2016 Augsburg–Munich Analysis Seminar, Germany

Mar 2016 Heriot-Watt University, UK

Mar 2016 OxPDE, University of Oxford, UK

Feb 2016 Imperial College, UK

Feb 2016 Colloquium at University of Reading, UK

Jan 2016 University of Warwick, UK

Oct 2015 Short course at CCA, University of Cambridge, UK

Oct 2015 OxPDE, University of Oxford, UK

Sep 2015 Gran Sasso Science Institute, L'Aquila, Italy

Aug 2015 Main lecture course at CMC Mini-School at Korean Institute for Advanced Study, Seoul, South Korea

Jun 2015 Charles University Prague, Czech Republic

Sep 2014 Plenary talk at Symposium on Trends in Application of Mathematics to Mechanics (STAMM), Poitiers, France

Apr 2014 University of British Columbia & PIMS, Vancouver, Canada

Mar 2014 Workshop on Relaxation, homogenization and dimensional reduction in hyperelasticity, Université Paris-Nord, France

Mar 2014 University of Regensburg, Germany

Mar 2014 Invited minisymposium talk at GAMM 2014, Erlangen, Germany

Feb 2014 Workshop “Recent Advances in Nonlinear PDE and Calculus of Variations”, University of Reading, UK

Jan 2014 Ludwig–Maximilian University Munich, Germany

Jan 2014 Lectures at 6th SW PDE Winter School, University of Oxford, UK

Jan 2014 Technical University of Dresden, Germany

Dec 2013 RWTH Aachen University, Germany

Nov 2013 BMS Intensive Course on Evolution Equations, Berlin, Germany

Apr 2013 Max Planck Institute for Gravitational Physics, Potsdam, Germany

Jan 2013 University of Sussex, UK

Nov 2012 OxPDE, University of Oxford, UK

Oct 2012 Weierstraß Institute (WIAS), Berlin, Germany

Oct 2012 University of Warwick, UK

Sep 2012 University of Zurich, Switzerland

Jul 2012 Oberwolfach workshop on the “Calculus of Variations”, Germany

Mar 2012 Universidade Nova de Lisboa, Lisbon, Portugal

Nov 2011 University of Cambridge, UK  
 Mar 2011 Hausdorff Center for Mathematics, University of Bonn, Germany  
 Mar 2011 OxpDE, University of Oxford, UK  
 Dec 2010 Weierstraß Institute (WIAS), Berlin, Germany  
 Dec 2010 University of Essen, Germany  
 Dec 2010 University of Bielefeld, Germany  
 Oct 2010 CNA, Carnegie Mellon University, Pittsburgh, USA  
 Sep 2010 BIRS workshop on “Rate-independent systems: Modeling, Analysis, & and Computations”, Banff, Canada  
 Sep 2008 OxpDE, University of Oxford, UK  
 Oct 2007 Autumn School “Analysis of Multiphase Problems”, Prague, Czech Republic  
 Jul 2006 Technical University Berlin, Germany

*60+ talks in total*

#### TEACHING

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

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

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

**Projects for 3rd-year and PhD students** in Calculus of Variations, PDEs (Cambridge & Warwick)

**Personal Director of Studies** in the CCA (Cambridge)

**Tutorials / exercise classes / personal tutor** for undergraduate students

**Examining and assessing** for PhD/MSc theses, undergraduate essays, assessor for Mathematics for Natural Scientists exam (Cambridge)

#### RESEARCH SUPERVISION

##### **Postdocs:**

- *David K. E. Green* (2018–2021)
- *Adolfo Arroyo-Rabasa* (2018–2021)
- *Bogdan Raita* (2018–2021)

##### **PhD students:**

- *Giles W. Shaw* (Cambridge, 2016)
- *Kamil Kosiba* (Warwick, expected 2019)
- *Anna Skorobogatova* (Warwick, expected 2022)

**Master students:**

- *Florian Wechsung* (Warwick & Bonn, 2015) • *Hamza Alawiye* (Warwick, 2016)
- *Kamil Kosiba* (Warwick, 2016) • *Vedika Agarwal* (Warwick, 2017)
- *Jack Thomas* (Warwick, 2017) • *Billy Sumners* (Warwick, 2019)

SERVICE

**Workshop organization**

- “*Recent Advances in PDEs and the Calculus of Variations*”, 4-day research workshop, 3–6 July 2017, with G. De Philippis, funded by EPSRC, MIUR SIR.
- “*Variational Methods for Stationary and Evolutionary Problems*”, 1-day workshop, 12 May 2015, funded by LMS, EPSRC, Warwick.

**Co-organizer** of departmental “Geometric Analysis and PDEs” seminar, Cambridge

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

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