

# Dr Silvio Fanzon FHEA

*Curriculum Vitæ*

## Lecturer in Applied Mathematics

Department of Mathematics, University of Hull

### Address




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University of Hull  
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United Kingdom

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🏠 [Homepage @ Hull](#)  
🔍 [Google Scholar](#)  
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🆔 [0000-0003-1974-1434](#)

## Academic Profile

I am a Lecturer in Applied Mathematics at the University of Hull, with a research and teaching role. My research is at the interface of *Inverse Problems*, *Optimization*, *Statistics* and *PDEs*. I have also experience in *Optimal Transport*, *Calculus of Variations*, *Measure Theory* and *Numerical analysis* in infinite-dimensional spaces. I am interested in applications to *Materials Science*, *Mathematical Imaging*, *Statistical Models for Sports* and *Machine Learning*. I have taught a diverse range of courses in the areas of *Analysis*, *Geometry*, *Probability*, *Statistics* and *Numerical Analysis*, at both the Undergraduate and Master levels.

## Education













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|-------------|---|---|
| 2024 – 2025 | <b>Postgraduate Certificate in Academic Practice (PCAP)</b> , University of Hull, UK  |   |
| 2014 – 2018 | <b>PhD in Mathematics</b> , University of Sussex, UK<br>Thesis: <i>Geometric patterns and Microstructures in the study of Material Defects and Composites</i><br>Grade: Pass with no corrections, Advisor: Prof. Mariapia Palombaro |  |
| 2012 – 2014 | <b>MSc in Mathematics</b> , Sapienza University, Italy<br>Thesis: <i>A variational approach to topological singularities in two-dimensions</i><br>Grade: 110/110 Cum Laude, Advisor: Prof. Marcello Ponsiglione                     |  |
| 2008 – 2011 | <b>BSc in Mathematics</b> , Sapienza University, Italy<br>Thesis: <i>The isoperimetric problem</i><br>Grade: 110/110 Cum Laude, Advisor: Prof. Annalisa Malusa  |  |

## Academic Positions

|               |   |
|---------------|---|
| 04/23 – Now   | <b>Lecturer in Applied Mathematics</b><br>Department of Mathematics, University of Hull, UK                                   |
| 06/22 – 03/23 | <b>Faculty member (University Assistant)</b><br>Department of Mathematics & Scientific Computing, University of Graz, Austria |
| 04/18 – 10/21 | <b>Postdoctoral Researcher</b><br>Department of Mathematics & Scientific Computing, University of Graz, Austria               |
| 09/14 – 03/18 | <b>Associate Tutor</b><br>Department of Mathematics, University of Sussex, UK   |

## Top 4 Publications

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- [1] *Asymptotic linear convergence of Fully–Corrective Generalized Conditional Gradient methods*  
MATHEMATICAL PROGRAMMING, 205:135–202, 2024  
K. Bredies, M. Carioni, **S. Fanzon**, D. Walter   
- [2] *A Generalized Conditional Gradient Method for Dynamic Inverse Problems with Optimal Transport Regularization*  
FOUNDATIONS OF COMPUTATIONAL MATHEMATICS, 23:833–898, 2023  
K. Bredies, M. Carioni, **S. Fanzon**, F. Romero   
- [3] *A superposition principle for the inhomogeneous continuity equation with Hellinger–Kantorovich-regular coefficients*  
COMMUNICATIONS IN PARTIAL DIFFERENTIAL EQUATIONS, 47(10):2023–2069, 2022  
K. Bredies, M. Carioni, **S. Fanzon**   
- [4] *Derivation of Linearized Polycrystals from a Two-Dimensional System of Edge Dislocations*  
SIAM JOURNAL ON MATHEMATICAL ANALYSIS, 51(5):3956–3981, 2019  
**S. Fanzon**, M. Palombaro, M. Ponsiglione   






















## List of Publications













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I have authored 11 Peer-Reviewed Journal Articles, 1 Book and 3 Theses

### Peer-Reviewed Journal Articles








Authors are listed in alphabetical order, unless marked by #

- [16] # *Elementary econometric and strategic analysis of curling matches*  
MANAGERIAL FINANCE, 51(7):1206–1216, 2025  
J. Fry, M. Austin, **S. Fanzon**   
- [15] # *Faster identification of faster Formula 1 drivers via time-rank duality*  
ECONOMICS LETTERS, 237:111671, 2024  
J. Fry, T. Brighton, **S. Fanzon**   
- [14] *Asymptotic linear convergence of Fully–Corrective Generalized Conditional Gradient methods*  
MATHEMATICAL PROGRAMMING, 205:135–202, 2024  
K. Bredies, M. Carioni, **S. Fanzon**, D. Walter   
- [13] *A Generalized Conditional Gradient Method for Dynamic Inverse Problems with Optimal Transport Regularization*  
FOUNDATIONS OF COMPUTATIONAL MATHEMATICS, 23:833–898, 2023  
K. Bredies, M. Carioni, **S. Fanzon**, F. Romero   
- [12] *A superposition principle for the inhomogeneous continuity equation with Hellinger–Kantorovich-regular coefficients*  
COMMUNICATIONS IN PARTIAL DIFFERENTIAL EQUATIONS, 47(10):2023–2069, 2022  
K. Bredies, M. Carioni, **S. Fanzon**   
- [11] *On the extremal points of the ball of the Benamou–Brenier energy*  
BULLETIN OF THE LONDON MATHEMATICAL SOCIETY, 53(5):1436–1452, 2021  
K. Bredies, M. Carioni, **S. Fanzon**, F. Romero   
- [10] *An optimal transport approach for solving dynamic inverse problems in spaces of measures*  
ESAIM: MATHEMATICAL MODELLING AND NUMERICAL ANALYSIS, 54(6):2351–2382, 2020  
K. Bredies, **S. Fanzon**   







- [9] *Uniform distribution of dislocations in Peierls–Nabarro models for semi-coherent interfaces*  
 CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, 59(4):141, 2020  
 S. Fanzon, M. Ponsiglione, R. Scala   
- [8] *Derivation of Linearized Polycrystals from a Two-Dimensional System of Edge Dislocations*  
 SIAM JOURNAL ON MATHEMATICAL ANALYSIS, 51(5):3956–3981, 2019  
 S. Fanzon, M. Palombaro, M. Ponsiglione   
- [7] *Optimal lower exponent for the higher gradient integrability of solutions to two-phase elliptic equations in two dimensions*  
 CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, 56(5):137, 2017  
 S. Fanzon, M. Palombaro   
- [6] *A Variational Model for Dislocations at Semi-coherent Interfaces*  
 JOURNAL OF NONLINEAR SCIENCE, 27(5):1435–1461, 2017  
 S. Fanzon, M. Palombaro, M. Ponsiglione   

## Miscellaneous

Authors are listed in alphabetical order, unless marked by #

- [5] # *Optimal Transport Based Convex Hybrid Image and Motion-Field Reconstruction*  
 2021 ISMRM & SMRT ANNUAL MEETING & EXHIBITION, 15-20 May 2021, Vancouver, Canada  
 I. Middelhoff, M. Schlögl, A. M. Fernández, S. Fanzon, K. Bredies, R. Stollberger 
- [4] *Geometric patterns and microstructures in the study of material defects and composites*  
 DOCTORAL THESIS (PHD), University of Sussex, 2018  
- [3] *A variational approach to topological singularities in two-dimensions (in Italian)*  
 MASTER THESIS, Sapienza University, 2014 
- [2] *Lecture Notes on Ordinary Differential Equations (in Italian)*  
 BOOK, ISBN: 8890734175, Edizioni LaDotta, 2013  
 S. Fanzon, A. Malusa  
- [1] *The isoperimetric problem (in Italian)*  
 BACHELOR THESIS, Sapienza University, 2011 

## Research Impact: Projects & Funding





















|         |   |
|---------|---|
| 2020/21 | Participation in FWF Research Project P29192 led by K. Bredies (€ 231k)<br>Project title: <i>Regularization Graphs for Variational Imaging</i>            |
| 2019/21 | Participation in FWF Research Project P28858 led by K. Bredies (€ 221k)<br>Project title: <i>Solving bilinear inverse problems by tensorial lifting</i>   |
| 2018/20 | Participation in FWF Research Project PIR-27 led by K. Bredies (€ 234k)<br>Project title: <i>Mathematical methods for motion-aware medical imaging</i>    |
| 2014/18 | Full-time PhD Studentship for 3.5 Years from the University of Sussex (£ 49k)<br>Project title: <i>Rigidity problems and Microstructures in Materials Science</i>   |
| 2014/18 | PhD Fees Waiver for 3.5 Years from the University of Sussex (£ 14k)   |
| 2014/18 | Research Grant from the University of Sussex (£ 5.8k)   |
| 2014/17 | Travel support from Carnegie Mellon University (US), Oxford University (UK),<br>SISSA (Italy), Warwick University (UK), National Research Council of Italy (total £ 4k)   |

## Teaching Experience










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I have taught 18 modules: 10 as Lecturer and 8 as Teaching Assistant

### Lecturer

|         |   |   |   |                             |
|---------|---|---|---|-----------------------------|
| 2024/25 |  |  | STATISTICAL MODELS, Y2 BSc Math                             | University of Hull, UK      |
|         |  |  | DIFFERENTIAL GEOMETRY, Y3 BSc Math                          |                             |
|         |  |  | NUMBERS, SEQUENCES AND SERIES, Y1 BSc Math                  |                             |
| 2023/24 |  |  | STATISTICAL MODELS, Y2 BSc Math                             |                             |
|         |  |  | NUMBERS, SEQUENCES AND SERIES, Y1 BSc Math                  |                             |
|         |  |  | DIFFERENTIAL GEOMETRY, Y3 BSc Math                          |                             |
| 2022/23 |  |  | ANALYSIS 3 (EXERCISE COURSE), Y2 BSc Math                   | University of Graz, Austria |
|         |  |  | INVERSE PROBLEMS (EXERCISE COURSE), Y2 MSc Math             |                             |
| 2020/21 |  |  | CALCULUS OF VARIATIONS, Y1 MSc Math                         |                             |
| 2019/20 |  |  | ADVANCED FUNCTIONAL ANALYSIS (EXERCISE COURSE), Y1 MSc Math |                             |

### Teaching Assistant




|         |   |  |                            |
|---------|---|--|----------------------------|
| 2017/18 |    | GEOMETRY 1, Y1 BSc Math                      | University of Sussex, UK   |
| 2016/17 |    | ANALYSIS 1, Y1 BSc Math                      |                            |
|         |   | INTRODUCTION TO PROBABILITY, Y1 BSc Math     |                            |
|         |    | MATHEMATICS DEMYSTIFIED, Y1 BSc Math         |                            |
| 2015/16 |    | PROBABILITY AND STATISTICS, Y2 BSc Math      |                            |
|         |    | INTRODUCTION TO PROBABILITY, Y1 BSc Math     |                            |
| 2014/15 |    | PROBABILITY AND STATISTICS, Y2 BSc Math      |                            |
| 2012/13 |   | ORDINARY DIFFERENTIAL EQUATIONS, Y2 BSc Math | Sapienza University, Italy |

## Academic Supervision




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I have supervised 6 students: 3 Master's and 3 Undergraduate students

### Master Students

|         |   |  |                        |
|---------|---|--|------------------------|
| 2023/24 |  | OLAPEJU ENITAN AROWOBUSOYE, MSc Mathematics                                      | University of Hull, UK |
|         |   | Thesis title: <i>A Complex Analysis approach to the isoperimetric inequality</i> |                        |
|         |  | LUCKY EKESHILI, MSc Mathematics  |                        |
|         |   | Thesis title: <i>The Euler-Lagrange equation</i>                                 |                        |
| 2022/23 |  | DAVID AWUKU, MSc Mathematics   |                        |
|         |   | Thesis title: <i>The Isoperimetric Problem</i>                                   |                        |

## Undergraduate Students

|         |   |   |                        |
|---------|---|---|------------------------|
| 2024/25 |  | DECLAN HODGES, BSc Mathematics<br>Thesis title: <i>Gödel's First Incompleteness Theorem</i>                   | University of Hull, UK |
|         |  | SAM FOWLER, BSc Mathematics<br>Thesis title: <i>Optimal transport, with applications to Logistic problems</i> |                        |
|         |  | JOE VARLEY, BSc Mathematics<br>Thesis title: <i>Geodesics, old and new</i>                                    |                        |



## Administrative Experience

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|---------|---|
| 2025/26 | Convenor of MSc Mathematics module "Dissertation Project" at the University of Hull |
| 2024/25 | Organized Welcome Week for BSc and MSc in Mathematics at the University of Hull     |
| 2023/24 | Responsible for open days Mathematics desk at the University of Hull                |

## Professional Qualifications & Memberships

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|------------|--|---|
| Since 2025 | Fellow of the Higher Education Academy (FHEA)                          |  |
| Since 2023 | Member of the <i>Inverse Problems International Association</i> (IPIA) |  |

## Technical Skills

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|----------|---|
| Coding   | Python, Matlab, R, C, Mathematica                           |
| Teaching | LaTeX, Quarto, Canvas, Panopto, MS Office, MS Teams, Moodle |
| Web      | Git, HTML, CSS, JavaScript, Jekyll, Liquid, YAML, Markdown  |

## Reviewer Activity

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|                                       |   |                              |   |
|---------------------------------------|---|------------------------------|---|
| SIAM Journal on Mathematical Analysis |  | Numerische Mathematik        |  |
| SIAM Journal on Imaging Sciences      |  | Inverse Problems and Imaging |  |
| ESAIM: COCV                           |  | Mathematics in Engineering   |  |
| Managerial Finance                    |  |                              |   |

## Research Stays

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|      |   |                      |
|------|---|----------------------|
| 2022 | UNIVERSITY OF SUSSEX, UK, 1–22 Jul and 27 Oct–5 Nov | Filippo Cagnetti     |
|      | HERIOT-WATT UNIVERSITY, UK, 12–16 Sep               | Panagiota Birmpa     |
| 2019 | SAPIENZA UNIVERSITY, Italy, 15–19 Apr and 8–17 Jul  | Marcello Ponsiglione |
| 2018 | SAPIENZA UNIVERSITY, Italy, 17–21 Dec               | Marcello Ponsiglione |
|      | UNIVERSITY OF GRAZ, Austria, 31 Jan–2 Feb           | Kristian Bredies     |

## Communication

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I have given 15 presentations: 12 oral presentations (11 invited) and 3 poster presentations (1 invited)







### Oral Presentations

☑ indicates invited presentation

|      |   |   |   |   |
|------|---|---|---|---|
| 2023 | ☑ | AIP 2023: 11TH APPLIED INVERSE PROBLEMS CONFERENCE<br>University of Göttingen, Germany, 4-8 Sep 2023                    |    |    |
| 2022 | ☑ | SUSSEX MATHEMATICS SEMINAR<br>University of Sussex, UK, 3 Nov 2022  |    |    |
|      | ☑ | SEMINAR, DEPARTMENT OF MATHEMATICS<br>Heriot-Watt University, UK, 13 Sep 2022   |    |    |
|      | ☑ | SEMINAR, DEPARTMENT OF MATHEMATICS & SCIENTIFIC COMPUTING<br>University of Graz, Austria, 18 Feb 2022                   |    |    |
| 2021 | ☑ | SIMAI 2020-2021 PARMA<br>University of Parma, Italy, 30 Aug - 3 Sep 2021  |    |    |
| 2019 | ☑ | M.A.G.A. DAYS (MONGE-AMPÈRE ET GÉOMÉTRIE ALGORITHMIQUE)<br>Laboratoire de mathématiques d'Orsay, France, 20-21 Nov 2019 |    |    |
|      | ☑ | 1ST AUSTRIAN CALCULUS OF VARIATIONS DAY<br>University of Vienna, Austria, 17-18 Oct 2019                                |    |    |
|      | ☑ | ICCOPT: 6TH INTERNATIONAL CONFERENCE ON CONTINUOUS OPTIMIZATION<br>Technical University Berlin, Germany, 3-8 Aug 2019   |    |    |
| 2018 | ☑ | TOPICS IN NONLINEAR ANALYSIS: CALCULUS OF VARIATIONS AND PDEs<br>University of Lisbon, Portugal, 10-12 Oct 2018         |  |  |
|      | ☑ | SEMINAR, DEPARTMENT OF MATHEMATICS & SCIENTIFIC COMPUTING<br>University of Graz, Austria, 31 Jan 2018                   |  |  |
| 2017 |   | XXVII NATIONAL MEETING OF CALCULUS OF VARIATIONS<br>Levico Terme, Italy, 6-10 Feb 2017                                  |  |  |
| 2016 | ☑ | WORKING SEMINAR ON CALCULUS OF VARIATIONS<br>Sapienza University, Italy, 19 Dec 2016                                    |   |  |

### Poster Presentations

☑ indicates invited presentation

|      |   |  |   |   |
|------|---|--|---|---|
| 2021 | ☑ | ITN TRaDe-OPT WINTER SCHOOL<br>Online, 15-19 Feb 2021  |  |  |
| 2016 |   | HYSTERESIS, AVALANCHES AND INTERFACES IN SOLID PHASE TRANSFORMATIONS<br>University of Oxford, UK, 19-21 Sep 2016 |  |  |
|      |   | PIRE-CNA. NEW FRONTIERS IN NONLINEAR ANALYSIS FOR MATERIALS<br>Carnegie Mellon University, US, 2-10 Jun 2016     |  |  |