

Research Areas	ANALYSIS OF NONLINEAR PDES; KINETIC THEORY; SPECTRAL APPROXIMATION & COMPUTATION; SMOOTH ERGODIC THEORY & CONTINUOUS-TIME DYNAMICAL SYSTEMS	
Employment	<p>Cardiff University, Cardiff, UK Since September 2016</p> <p><i>School of Mathematics</i> Reader (Associate Professor), since 2019 Senior Lecturer, 2016-2019 EPSRC Early Career Fellow, 2016-2022</p> <p>Imperial College London, London, UK 2014-2017</p> <p>Junior Research Fellow, <i>Department of Mathematics</i> (resigned 2016)</p> <p>University of Cambridge, Cambridge, UK 2011-2014</p> <p>Research Associate jointly at: <i>Cambridge Centre for Analysis</i> <i>Department of Applied Mathematics and Theoretical Physics</i> Supernumerary Fellow, <i>Pembroke College</i></p>	
Education	<p>Brown University, Providence, Rhode Island, USA</p> <p>Ph.D., Mathematics May 2011 Advisor: Walter A. Strauss</p> <p>M.Sc., Applied Mathematics May 2009</p> <p>M.Sc., Mathematics May 2008</p> <p>Teaching Certificate May 2008</p> <p>Hebrew University of Jerusalem, Jerusalem, Israel</p> <p>B.Sc., Mathematics-Physics (dual degree) June 2006</p>	
Fellowships, Grants & Awards	<p>Marie Skłodowska-Curie Fellowship: €212,934 (ref. 885904) 2020-2022 European Commission (role: supervisor of Dr Frank Rösler)</p> <p>Marie Skłodowska-Curie Fellowship: €195,455 (ref. 790623) 2018-2020 European Commission (role: supervisor of Dr Junyong Zhang)</p> <p>LMS Research in Pairs (Scheme 4): £1200 (ref. 41817) November 2018 London Mathematical Society (for visit of Prof. Stephen Pankavich)</p> <p>Outstanding Contribution Award October 2018 Cardiff University</p> <p>SCoRE Cymru: £600 for visit of Dr Junyong Zhang (ref. SC17003) April 2017 Welsh European Funding Office</p> <p>EPSRC Early Career Fellowship: £977,978 (ref. EP/N020154/1) 2016-2022 UK Engineering and Physical Sciences Research Council</p> <p>Conference funding for the conference “<i>The Cauchy Problem in Kinetic Theory: Recent Progress in Collisionless Models</i>”, Imperial College London, September 2015:</p> <p>❑ LMS Conference Grant (Scheme 1): £7,000 (ref. 11443) March 2015</p>	

Junior Research Fellowship: £175,000 Imperial College London	2014-2017
Supernumerary Fellowship Pembroke College, Cambridge	2011-2013
Outstanding Teaching Award Department of Mathematics, Brown University	May 2011
Young Researcher Travel Award The Seventh IMACS Conference	April 2011
Coline M. Makepeace Fellowship Graduate School, Brown University	2006-2007

Preprints

23. Asymptotic Growth and Decay of Two-Dimensional Symmetric Plasmas
(with B. Morisse and S. Pankavich)
Preprint, **arXiv:2202.03717**, 26 pages
22. Strichartz estimates for the Klein-Gordon equation in a conical singular space
(with F. Cacciafesta, A.-S. de Suzzoni and J. Zhang)
Preprint, **arXiv:2007.05331**, 44 pages
21. Averaging along degenerate flows on the annulus
(with B. Morisse)
Preprint, **arXiv:1902.06681**, 14 pages
20. Computing Spectra – On the Solvability Complexity Index Hierarchy and Towers of Algorithms
(with M. J. Colbrook, A. C. Hansen, O. Nevanlinna and M. Seidel)
Preprint, **arXiv:1508.03280**, 93 pages
19. The Solvability Complexity Index - Computer Science and Logic Meet Scientific Computing
(with A. C. Hansen, O. Nevanlinna and M. Seidel)
Preprint, https://jbenartzi.github.io/papers/SCI_STOC_Final.pdf, 15 pages

Publications

18. On the complexity of the inverse Sturm-Liouville problem
(with M. Marletta and F. Rösler)
Pure and Applied Analysis (in revision), **arXiv:2203.13078**, 26 pages
17. Computing scattering resonances
(with M. Marletta and F. Rösler)
J. Eur. Math. Soc. (JEMS), online first, <https://doi.org/10.4171/jems/1258>
16. Global Strichartz estimates for the Dirac equation on symmetric spaces
(with F. Cacciafesta, A.-S. de Suzzoni and J. Zhang)
Forum of Math., Sigma **10**(e25), 1-38 (2022)
15. Universal algorithms for computing spectra of periodic operators
(with M. Marletta and F. Rösler)
Numer. Math. **150**, 719-767 (2022)

14. A toy model for the relativistic Vlasov-Maxwell system
(with S. Pankavich and J. Zhang)
Kinetic & Related Models **15**(3), 341-354 (2022)
13. Computing the sound of the sea in a seashell
(with M. Marletta and F. Rösler)
Found. Comput. Math. (FoCM) **22**, 697-731 (2022)
12. Uniform convergence in von Neumann's ergodic theorem in the absence of a spectral gap
(with B. Morisse)
Ergod. Theor. Dyn. Syst. **41**(6), 1601-1611 (2021)
11. Weak Poincaré inequalities in the absence of spectral gaps
(with A. Einav)
Ann. Henri Poincaré **21**(2), 359-375 (2020)
10. Concentrating solutions of the relativistic Vlasov-Maxwell system
(with S. Calogero and S. Pankavich)
Commun. Math. Sci. **17**(2), 377-392 (2019)
9. Arbitrarily large solutions of the Vlasov-Poisson system
(with S. Calogero and S. Pankavich)
SIAM J. Math. Anal. **50**(4), 4311-4326 (2018)
8. Instabilities of the relativistic Vlasov-Maxwell system on unbounded domains
(with T. Holding)
SIAM J. Math. Anal. **49**(5), 4024-4063 (2017)
7. Moment bounds on the corrector of stochastic homogenization of non-symmetric elliptic finite difference equations (with D. Marahrens and S. Neukamm)
Commun. PDE **42**(2), 179-234 (2017)
6. Approximations of strongly continuous families of unbounded operators
(with T. Holding)
Commun. Math. Phys. **345**(2), 615-630 (2016)
5. Instabilities in kinetic theory and their relationship to the ergodic theorem
Contemp. Math. **653**, 25-40 (2015)
4. New barriers in complexity theory: On The Solvability Complexity Index and Towers of Algorithms
(with A. C. Hansen, O. Nevanlinna and M. Seidel)
C. R. Acad. Sci. **353**, 931-936 (2015)
3. On the spectrum of shear flows and uniform ergodic theorems
J. Funct. Anal. **267**, 299-322 (2014)
2. Instability of nonsymmetric nonmonotone equilibria of the Vlasov-Maxwell system
J. Math. Phys. **52**, 123703, pp. 1-21 (2011)
1. Instability of nonmonotone magnetic equilibria of the relativistic Vlasov-Maxwell system
Nonlinearity **24**, 3353-3389 (2011)

**Invited
Conference
Talks**

Stability Analysis for Nonlinear PDEs

OxPDE, University of Oxford, Oxford, UK

August 2022

Mathematical aspects of the physics with non-self-adjoint operators

Banff International Research Station, Alberta, Canada

July 2022

Event & Seminar Organisation	International Workshop on Operator Theory and its Applications: Special Session on Spectral Theory and Differential Operators Lancaster University, Lancaster, UK (online)	August 2021
	Modélisation océan-atmosphère Université de Rennes 1, Rennes, France	September 2019
	The 23rd Bi-Annual Mini-Workshop in Applied and Computational Mathematics Hebrew University of Jerusalem, Jerusalem, Israel	December 2018
	South-West Network in Generalised Solutions for Nonlinear PDEs Cardiff University, Cardiff, UK	September 2017
	Montréal Analysis Seminar McGill University, Montréal, Canada	April 2017
	Workshop on Hilbert's Sixth Problem University of Leicester, Leicester, UK	May 2016
	London Analysis Seminar University College London, London, UK	November 2015
	Bath-WIMCS Analysis Day Cardiff University, Cardiff, UK	September 2015
	Kinetic and Related Equations BIRS-CMO, Oaxaca, Mexico	July 2015
	Complex Analysis & Dynamical Systems VII Nahariya, Israel	May 2015
	Microlocal Day 5 Imperial College London, London, UK	January 2015
	The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications: Special Session on Kinetic Models Madrid, Spain	July 2014
	Mathematical Topics in Kinetic Theory University of Cambridge, Cambridge, UK	June 2013
	Complex Analysis & Dynamical Systems VI Nahariya, Israel	May 2013
	Probabilistic Methods in Kinetic Theory CIRM, Luminy, France	July 2011
	The Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory University of Georgia, Athens, GA, USA	April 2011
Event & Seminar Organisation	Organiser , Intradisciplinary Lecture Series, Cardiff University	2018- <i>present</i>
	Co-organiser: South Wales Analysis and Probability Seminar (SWAP) Cardiff and Swansea Universities	2018- <i>present</i>

Joint organiser of a seminar series alternating between Cardiff and Swansea (3-4 times a year) focusing on analysis and probability with local and external speakers. Website [link](#).

Organiser, Cardiff Informal Analysis & PDE Seminar, Cardiff University 2017-present

Co-Organiser, Cardiff Analysis Online Seminar (CAOS), Cardiff University 2020-2022

Organiser, Analysis Seminar, Cardiff University 2019-2020

Workshop Organiser: “Small Scales and Homogenisation (SmaSH)”
Cardiff University June 2019
Jointly organised (with B. Morisse and F. Rösler) an international workshop with 10 invited speakers from around the world, and a total of 40 participants. Website [link](#).

Workshop Organiser: “An Analyst, a Geometer and a Probabilist Walk Into a Bar”
Cardiff University June 2018
Jointly organised (with B. Morisse) an international workshop with 11 invited speakers and a total of 40 participants. Website [link](#).

Conference Organiser: “The Cauchy Problem in Kinetic Theory: Recent Progress in Collisionless Models”
Imperial College London September 2015
Served as the main organiser of an international conference of over 25 invited speakers from around the world, and a total of 50 participants. Obtained funding (see above), set up a website ([link](#)), produced a poster (available on the website) and handled all other administrative aspects.

Co-organiser, Analysis Seminar, Imperial College London 2015-2016

Local Organiser: “Mathematical Topics in Kinetic Theory”
University of Cambridge June 2013

Organiser, PDE Seminar, University of Cambridge 2011-2014

Organiser, Informal PDE Seminar, Brown University 2010-2011

Service

Special Issue Editor, *Mathematics* (journal) 2020
Editor of special issue “Modern Analysis and Partial Differential Equations”.

Member of Internal Review Panel, Cardiff University January 2020
Member of the Round 5 UKRI Future Leaders Fellowships Expression of Interest panel within the College of Physical Sciences and Engineering.

Member of University Senate, Cardiff University 2019-2020

Member of School Research Committee, School of Mathematics, Cardiff University 2019-2021

Postdoc Rep, Department of Mathematics, Imperial College London 2014-2015
Responsible for representing postdocs of the mathematics department to the College, and organising career development and social events.

Grant Refereeing: Czech Science Foundation, UK Engineering and Physical Sciences Research Council, Research Grants Council of Hong Kong, Agence Nationale de la Recherche (France)

Journal Refereeing: Discrete and Continuous Dynamical Systems - Series A, Kinetic and Related Models,

Rocky Mountain Journal of Mathematics, Journal of Functional Analysis, SIAM Journal on Mathematical Analysis, Communications in Partial Differential Equations, Communications in Mathematical Physics, Advances in Mathematics, Journal of Differential Equations, Journal of Computational and Applied Mathematics, Proceedings of the London Mathematical Society, Journal of Ocean Engineering and Marine Energy, Proceedings of the Royal Society of Edinburgh, Nonlinearity, Journal de Mathématiques Pures et Appliquées, Mathematische Annalen, Foundations of Computational Mathematics

Reviewer, Mathematical Reviews

2012-present

Postdoc Mentoring

Frank Rösler, 2018-2022. Frank received his PhD in 2018 under the supervision of Prof. Patrick Dondl at Durham/Freiburg Universities. Frank was awarded a Marie Skłodowska-Curie Fellowship while in Cardiff.

Junyong Zhang, 2018-2020. Junyong received his PhD in 2011 under the supervision of Prof. Changxing Miao at the Institute of Applied Physics and Computational Mathematics in Beijing. Junyong was awarded a Marie Skłodowska-Curie Fellowship while in Cardiff. He is now a Professor at the Beijing Institute of Technology.

Baptiste Morisse, 2017-2020. Baptiste received his PhD in 2017 under the supervision of Dr Benjamin Texier at Université Paris-Diderot.

PhD Students

Alexei Stepanenko, 2018-2022. Alexei's thesis was entitled "Spectral approximation and eigenvalue bounds for differential operators", jointly supervised with Prof. Marco Marletta. Alexei went on to Cambridge University with a Fellowship awarded by the London Mathematical Society.

Thomas Holding, 2012-2016. Served as a junior doctoral supervisor. Thomas went on to a postdoctoral position with Prof. Martin Hairer.

Undergraduate & Masters Student Supervision

Cardiff University, Cardiff, UK

Since 2016

Masters and Undergraduate

- ❑ Oliver Nelson: *"The Axiom of Choice and the Banach-Tarski Paradox"*, 2022-2023
- ❑ Ronak Sachin Chavan: *"Human Factors in Process Safety Events"*, Summer 2022
- ❑ Thomas Anquetil: *"Kinetic Theory"*, Summer 2018

Imperial College London, London, UK

2014-2016

Masters and Undergraduate

- ❑ Maria del Valle Varo: *"Hilbert's Sixth Problem: From Micro to Macroscopic Descriptions"*, Summer 2016
- ❑ Paul Ramond: *"Landau Damping: Physics vs Mathematics"*, 2015-2016
- ❑ Wei Yu: *"Infinite-dimensional spaces, the spectral theorem and the ergodic theorem"*, Summer 2015
- ❑ Charafeddine Mouzouni: *"Topics in existence, uniqueness and stability of solutions to Vlasov systems in Kinetic Theory"*, Spring 2015

University of Cambridge, Cambridge, UK

2011-2014

Masters

- ❑ Zhuo Min Lim: *"Jeans' Theorem in Kinetic Theory"*, 2013-2014
- ❑ Thomas Holding: *"Instability of the Vlasov-Maxwell system on unbounded domains"*, 2012-2013
- ❑ Luca Calatroni: *"Linear stability and instability of plasmas"*, 2011-2012

Teaching	Cardiff University , Cardiff, Wales, UK	Since 2016
	Undergraduate & Masters Teaching	
	<ul style="list-style-type: none"> ❑ <i>Partial Differential Equations</i> (MA3016), Autumn 2022 ❑ <i>Differential Geometry of Curves and Surfaces</i> (MA3010), Autumn 2018 	
	Imperial College London , London, UK	2014-2016
	Postgraduate Teaching <ul style="list-style-type: none"> ❑ <i>Dispersive Equations</i> (taught jointly with Dr Arick Shao), Autumn 2015 <p>Course taught via video conferencing at the <i>Taught Course Centre</i>, a joint postgraduate teaching centre between Bath, Bristol, Imperial College, Oxford and Warwick.</p>	
	University of Cambridge , Cambridge, UK	2011-2014
	Postgraduate Teaching	
	<ul style="list-style-type: none"> ❑ Supervision of Doctoral PDE course project "<i>Incompressible flows and the Beale-Kato-Majda criterion</i>", 2011-2012 ❑ Teaching Assistant for Doctoral course <i>Kinetic Theory</i>, Autumn 2011 	
	Undergraduate Course Supervisions	
	<ul style="list-style-type: none"> ❑ <i>Vector Calculus</i>, Spring 2012 & 2013 ❑ <i>Numerical Analysis</i>, Spring 2013 ❑ <i>Vectors and Matrices</i>, Autumn 2012 ❑ <i>Methods</i>, Autumn 2011 & 2012 	
	Brown University , Providence, Rhode Island, USA	2006-2011
	Undergraduate Teaching	
	<ul style="list-style-type: none"> ❑ <i>Multivariable Calculus</i> (MA 0180), Autumn 2009 & Autumn 2010 ❑ <i>Analytic Geometry and Calculus</i> (MA 0060), Spring 2009 ❑ <i>Honors Multivariable Calculus</i> (MA 0350), Autumn 2008 	
	Sheridan Center Teaching Certificate , Completed May 2008	
Seminar Talks	Brown University, Cardiff University, Columbia University, Hebrew University of Jerusalem, Imperial College London, Max Planck Institute Leipzig, McGill University, Princeton University, Technion-Israel Institute of Technology, Université Aix-Marseille, University of Bath, University of Bremen, University of Cambridge, University of Crete, University of Glasgow, University of Oxford, Université Paris Nord (13), University of Reading, University of Surrey, University of Sussex, University of Warwick.	
Academic Visits	Hebrew University of Jerusalem , Jerusalem, Israel: December 2018 (one week)	
	Brown University , Providence, RI, USA: April 2017 (one week), March 2012 (one week)	
	Durham University , Durham, UK: June 2016 (one month)	
	Max Planck Institute , Leipzig, Germany: March 2014 (one week), June 2013 (one week), April 2013 (one week), December 2012 (two weeks), April 2012 (one week), February 2012 (one week), January 2012 (one week), December 2011 (one week)	
	Université Paris 13 , Paris, France: November 2012 (one week)	

Memberships	London Mathematical Society , member	2014– <i>present</i>
	American Mathematical Society , member	2018– <i>present</i>
Contact Information	<div> <div> School of Mathematics Cardiff University Abacws Building Senghennydd Road Cardiff CF24 4AG Wales, United Kingdom </div> <div> <i>Email:</i> Ben-ArtziJ@cardiff.ac.uk <i>Webpage:</i> https://jbenartzi.github.io/ </div> </div>	