

# Dr Jonathan Ben-Artzi

---

RESEARCH AREAS	Spectral analysis, Ergodic theory, Analysis of Nonlinear PDEs, Kinetic theory, Computational complexity	
EMPLOYMENT	<b>Cardiff University</b> , Cardiff, UK	Since September 2016
	Senior Lecturer (Associate Professor), <i>School of Mathematics</i> EPSRC Early Career Fellow, 2016-2021	
	<b>Durham University</b> , Durham, UK	July-September 2016
	Lecturer (Assistant Professor), <i>Department of Mathematical Sciences</i>	
	<b>Imperial College London</b> , London, UK	2014-2017
	Junior Research Fellow, <i>Department of Mathematics</i> (resigned 2016)	
	<b>University of Cambridge</b> , Cambridge, UK	2011-2014
	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>	
QUALIFICATIONS	<b>Brown University</b> , Providence, Rhode Island, USA	
	Ph.D., Mathematics	May 2011
	Advisor: Walter A. Strauss	
	M.Sc., Applied Mathematics	May 2009
	M.Sc., Mathematics	May 2008
	Teaching Certificate	May 2008
	<b>Hebrew University of Jerusalem</b> , Jerusalem, Israel	
	B.Sc., Mathematics-Physics (dual degree)	June 2006
FELLOWSHIPS, GRANTS & AWARDS	<b>EPSRC Early Career Fellowship: £977,978</b> (ref. EP/N020154/1) <i>Engineering and Physical Sciences Research Council</i>	2016-2021
	<b>SCoRE Cymru: £600</b> for visit of Junyong Zhang (ref. SC17003) <i>Welsh European Funding Office</i>	April 2017
	<b>Conference funding</b> for the conference “ <i>The Cauchy Problem in Kinetic Theory: Recent Progress in Collisionless Models</i> ”, Imperial College, London, September 2015:	
	□ <b>LMS Conference Grant (Scheme 1): £7,000</b> (ref. 11443) <i>London Mathematical Society</i>	March 2015
	□ <b>EPSRC Platform Grant: £10,000</b> (ref. W031JB) <i>Department of Mathematics, Imperial College London</i>	February 2015
	<b>Junior Research Fellowship: £175,000</b> Imperial College London	2014-2017
	<b>Supernumerary Fellowship</b> Pembroke College, Cambridge	2011-2013

<b>Outstanding Teaching Award</b> Department of Mathematics, Brown University	May 2011
<b>Young Researcher Travel Award</b> The Seventh IMACS Conference	April 2011
<b>Coline M. Makepeace Fellowship</b> Graduate School, Brown University	2006-2007

PUBLICATIONS  
& SUBMITTED  
PAPERS

11. Can everything be computed? - On the Solvability Complexity Index and Towers of Algorithms (with A. C. Hansen, O. Nevanlinna and M. Seidel)  
*Submitted, arXiv:1508.03280*, 79 pages
10. 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/Files/SCI\\_STOC\\_Final.pdf](https://jbenartzi.github.io/Files/SCI_STOC_Final.pdf)*, 15 pages
9. Arbitrarily large solutions of the Vlasov-Poisson system  
(with S. Calogero and S. Pankavich)  
*Submitted, arXiv:1708.02307*, 19 pages
8. Instabilities of the relativistic Vlasov-Maxwell system on unbounded domains  
(with T. Holding)  
*SIAM J. Math. Anal.*, **49**, 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

<b>South-West Network in Generalised Solutions for Nonlinear PDEs</b> Cardiff University, Cardiff, UK	September 2017
<b>Montréal Analysis Seminar</b> McGill University, Montréal, Canada	April 2017

	<b>Workshop on Hilbert's Sixth Problem</b> University of Leicester, Leicester, UK	May 2016
	<b>London Analysis Seminar</b> University College London, London, UK	November 2015
	<b>Bath-WIMCS Analysis Day</b> Cardiff University, Cardiff, UK	September 2015
	<b>BIRS-CMO Workshop: Kinetic and Related Equations</b> Oaxaca, Mexico	July 2015
	<b>Complex Analysis &amp; Dynamical Systems VII</b> Nahariya, Israel	May 2015
	<b>Microlocal Day 5</b> Imperial College London, London, UK	January 2015
	<b>The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications: Special Session on Kinetic Models</b> Madrid, Spain	July 2014
	<b>Mathematical Topics in Kinetic Theory</b> University of Cambridge, Cambridge, UK	June 2013
	<b>Complex Analysis &amp; Dynamical Systems VI</b> Nahariya, Israel	May 2013
	<b>Probabilistic Methods in Kinetic Theory</b> CIRM, Luminy, France	July 2011
	<b>The Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory</b> University of Georgia, Athens, GA, USA	April 2011
SERVICE	<b>Conference Organiser: "The Cauchy Problem in Kinetic Theory: Recent Progress in Collisionless Models"</b> Imperial College London	September 2015
	<i>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 (<a href="http://wwwf.imperial.ac.uk/~jbenartz/conference">http://wwwf.imperial.ac.uk/~jbenartz/conference</a>), produced a poster (available on the website) and handled all other administrative aspects.</i>	
	<b>Co-organiser</b> , Analysis Seminar, Imperial College London	2015-2016
	<b>Postdoc Rep</b> , Department of Mathematics, Imperial College London	2014-2015
	<i>Responsible for representing postdocs of the mathematics department to the College, and organising career development and social events.</i>	
	<b>Local Organiser: "Mathematical Topics in Kinetic Theory"</b> University of Cambridge	June 2013
	<b>Organiser</b> , PDE Seminar, University of Cambridge	2011-2014
	<b>Organiser</b> , Informal PDE Seminar, Brown University	2010-2011

**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

**Reviewer,** Mathematical Reviews 2012-*present*

PROFESSIONAL  
ORGANISATIONS  
SUPERVISION

**London Mathematical Society,** member 2014-*present*

**Imperial College London,** London, UK 2014-2016

#### Doctoral

□ Thomas Holding, 2012-2016

Served as a junior doctoral supervisor and coauthored papers [6] and [9] above. Thomas went on to a postdoctoral position with Prof. Martin Hairer (Warwick).

#### 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

**Imperial College London,** London, UK 2014-2016

#### Postgraduate Teaching

□ *Dispersive Equations* (taught jointly with Dr Arick Shao), Autumn 2015

Course taught via video conferencing at the *Taught Course Centre*, a joint postgraduate teaching centre between Bath, Bristol, Imperial College, Oxford and Warwick.

**University of Cambridge,** Cambridge, UK 2011-2014

#### Postgraduate Teaching

□ Teaching Assistant for Doctoral course *Kinetic Theory*, Autumn 2011

- ❑ Supervision of Doctoral PDE course project *"Incompressible flows and the Beale-Kato-Majda criterion"*, 2011-2012

#### **Undergraduate Course Supervisions**

- ❑ *Methods*, Autumn 2011 & 2012
- ❑ *Vectors and Matrices*, Autumn 2012
- ❑ *Vector Calculus*, Spring 2012 & 2013
- ❑ *Numerical Analysis*, Spring 2013

**Brown University**, Providence, Rhode Island, USA

2006-2011

#### **Undergraduate Teaching**

- ❑ *Multivariable Calculus* (MA 0180), Autumn 2009 & Autumn 2010
- ❑ *Analytic Geometry and Calculus* (MA 0060), Spring 2009
- ❑ *Honors Multivariable Calculus* (MA 0350), Autumn 2008

**Sheridan Center Teaching Certificate**, Completed May 2008

#### SEMINAR TALKS

**2017:** McGill University, Princeton University

**2015-2016:** Cardiff University, Hebrew University of Jerusalem, Imperial College London, Université Aix-Marseille, University of Bath, University of Crete, University of Glasgow, University of Oxford, University of Reading, University of Surrey, University of Sussex, University of Warwick

**2010-2014:** Brown University, Columbia University, Imperial College London, Max Planck Institute Leipzig, Technion-Israel Institute of Technology, Université Paris 13, University of Cambridge, University of Oxford, University of Warwick

#### ACADEMIC VISITS

**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)

**Brown University**, Providence, RI, USA: April 2017 (one week), March 2012 (one week)