europass Curriculum vitae

PERSONAL INFORMATION

Carlo Mercuri

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Gender Male | Nationality Italian

SCIENTIFIC FIELD OF INTEREST

Research and Teaching: mainly in Mathematical Analysis

Academic Qualification: National Scientific Abilitation (Italy) as Associate Professor in Mathematical Analysis (Professore di Seconda Fascia nel settore concorsuale 01/A3 ANALISI MATEMATICA, PROBABILITÀ E STATISTICA MATEMATICA)

EMPLOYMENT HISTORY

November 2022 – Present
Associate Professor (Permanent Position)
Department of Mathematics
Università degli Studi di Modena e Reggio Emilia
Via Giuseppe Campi 213b, 41125
Modena, Italia

November 2022 – September 2024
Honorary Associate Professor
Department of Mathematics
Swansea University, Bay Campus Fabian Way,
Swansea SA1 8EN Wales, UK

March 2021 – Present
Associate Professor (Permanent Position)
Department of Mathematics
Swansea University, Bay Campus Fabian Way,
Swansea SA1 8EN Wales, UK

Contract: Enhanced Research

March 2018 – Feb 2021
Senior Lecturer (Permanent Position)
Department of Mathematics
Swansea University, Bay Campus Fabian Way,
Swansea SA1 8EN Wales, UK

Contract: Enhanced Research

Sept 2013 – Feb 2018
Lecturer (Permanent Position)
Department of Mathematics
Swansea University, Bay Campus Fabian Way,
Swansea SA1 8EN Wales, UK

Contract: Enhanced Research

June 2011 – Aug 2013
Postdoc
Technische Universiteit Eindhoven at Centre for Analysis, Scientific Computing and Applications (CASA) and Institute for Complex Molecular Systems (ICMS) - Netherlands

Supervisor: Prof. Mark A. Peletier

Feb 2006 – July 2006
Instructor (Cultore della materia)

Dipartimento di Matematica - Università degli Studi di Milano - Via Festa del Perdono, 7 - Milano, Italia

Supervisor Prof. Bernhard Ruf

EDUCATION AND AWARDS

14 July 2017 **Postgraduate Certificate in teaching in Higher Education (PGCtHE)**

Awarded at Swansea University, UK

25 May 2017 **Fellow of the Higher Education Academy, UK**

29 Oct 2010 **PhD in Mathematical Analysis**

Awarded at International School for Advanced Studies (SISSA/ISAS) Trieste (Italy)

Thesis On some nonlinear problems with lack of compactness in critical point theory

Supervisor Prof. Antonio Ambrosetti

2006 Winner of PhD scholarships (on competitive basis and entrance exam) at University of Pavia and University of Milano. These have been opted out upon acceptance of the PhD scholarship at SISSA - Trieste.

6 Feb 2006 **MSc in Physics (Fisica Teorica)**

Awarded at Università degli Studi di Milano (Italy) - 110/110 cum Laude

Thesis Su una classe di soluzioni di un'equazione di Schrödinger nonlineare: esistenza, concentrazione su una circonferenza e limite semiclassico

Supervisor Prof. Bernhard Ruf

SUBMITTED PUBLICATION

[1] Baumeier B, Çaylak O, Mercuri C, Peletier MA, Prokert G, Scharpach W. Existence and uniqueness of solutions to the time-dependent Kohn-Sham equations coupled with classical nuclear dynamics, arXiv:2011.10542 (2020)

SCOPUS

287 citations, h-index 10

PUBLICATIONS ON PEER REVIEWED INTERNATIONAL MATH JOURNALS

[1] Mercuri C., Perera K. "New multiplicity results for critical p-Laplacian problems." In: *JOURNAL OF FUNCTIONAL ANALYSIS, 283 doi.org/10.1016/j.jfa.2022.109536* (2022).

[2] Dutko T., Mercuri C., Tyler M. T. "Groundstates and infinitely many high energy solutions to a class of nonlinear Schrödinger-Poisson systems." In: *CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, no. 5, Paper No. 174, 46 pp., doi: 10.1007/s00526-021-02045-y* (2021).

[3] Albalawi W., Mercuri C. Moroz V. "Groundstate asymptotics for a class of singularly perturbed p-Laplacian problems in R^N." In: *ANNALI DI MATEMATICA PURA ED APPLICATA, vol. 199, p. 23-63, doi: 10.1007/s10231-019-00865-6* (2020).

[4] Mercuri C., Tyler T.M. "On a class of nonlinear Schrödinger–Poisson systems involving a nonradial charge density." In: *REVISTA MATEMATICA IBEROAMERICANA, 36, no. 4, 1021–1070. doi: 10.4171/rmi/1158* (2020).

[5] Farina A., Mercuri C., Willem M. "A Liouville theorem for the p-Laplacian and related questions." In: *CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, vol. 58, doi: 10.1007/s00526-019-1596-y* (2019).

[6] Mercuri C., dos Santos E.M. “Quantitative symmetry breaking of groundstates for a class of weighted Emden-Fowler equations.” In: *NONLINEARITY, vol. 32, p. 4445-4464, doi: 10.1088/1361-6544/ab2d6f* (2019).

[7] Bellazzini J., Ghimenti M., Mercuri C., Moroz V., Van Schaftingen J. “Sharp Gagliardo-Nirenberg Inequalities in Fractional Coulomb-Sobolev Spaces.” In: *TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY, vol. 370, p. 8285–8310, doi: 10.1090/tran/7426* (2018).

[8] Mercuri C., Moroz V., Van Schaftingen J. “Goundstates and radial solutions to nonlinear Schrödinger-Poisson-Slater equations at the critical frequency.” In: *CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, vol. 55, doi: 10.1007/s00526-016-1079-3* (2016).

[9] Mercuri C., Riey G., Sciunzi B. “A Regularity Result for the p-Laplacian near uniform ellipticity.” In: *SIAM JOURNAL ON MATHEMATICAL ANALYSIS, vol. 48, p. 2059-2075, doi: 10.1137/16M1058546* (2016).

[10] Mercuri C., Sciunzi B., Squassina M. “On Coron’s problem for the p-Laplacian.” In: *JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS, vol. 421, p. 362-369, doi: 10.1016/j.jmaa.2014.07.018* (2015).

[11] Mercuri C., Pacella F. “On the pure critical exponent problem for the p-Laplacian”. In: *CALCULUS OF VARIATIONS AND PARTIAL DIFFERENTIAL EQUATIONS, vol. 49, p. 1075-1090, doi: 10.1007/s00526-013-0612-x* (2014).

[12] Mercuri C., Squassina M. “Global compactness for a class of quasi-linear elliptic problems.” In: *MANUSCRIPTA MATHEMATICA, vol. 140, p. 119-144, doi: 10.1007/s00229-012-0533-6* (2013).

[13] Bonheure D., Di Cosmo J., Mercuri C. “Concentration on Circles for Nonlinear Schrödinger-Poisson Systems with Unbounded Potentials Vanishing at Infinity.” In: *COMMUNICATIONS IN CONTEMPORARY MATHEMATICS, vol. 14, doi: 10.1142/S0219199712500095* (2012).

[14] Bonheure D., Mercuri C. “Embedding theorems and existence results for nonlinear Schrödinger-Poisson systems with unbounded and vanishing potentials.” In: *JOURNAL OF DIFFERENTIAL EQUATIONS, vol. 251, p. 1056-1085, doi: 10.1016/j.jde.2011.04.010* (2011).

[15] Mercuri C., Willem M. “A Global Compactness Result for the p-Laplacian involving critical nonlinearities.” In: *DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS, vol. 28, p. 469-493, doi: 10.3934/dcds.2010.28.469* (2010).

[16] Fall M.M., Mercuri C. “Foliations of small tubes in Riemannian manifolds by capillary minimal discs.” In: *NONLINEAR ANALYSIS, vol. 70, p. 4422-4440, doi: 10.1016/j.na.2008.10.024* (2009).

[17] Fall M.M., Mercuri C. “Minimal Disc-Type Surfaces Embedded in a Perturbed Cylinder.” In: *DIFFERENTIAL AND INTEGRAL EQUATIONS, vol. 22, p. 1115-1124, ISSN: 0893-4983* (2009).

[18] Mercuri C. “Positive solutions of nonlinear Schrödinger-Poisson systems with radial potentials vanishing at infinity.” In: *ATTI DELLA ACCADEMIA NAZIONALE DEI LINCEI. RENDICONTI LINCEI. MATEMATICA E APPLICAZIONI, vol. 19, p. 211-227, doi: 10.4171/RLM/520* (2008).

OTHER PUBLICATION

[1] Bonaschi G, Filatova O, Mercuri C, Muntean A, Peletier MA, Shchetnikava V, Siero E, Zisis I (2013) Identification of a Response Amplitude Operator for Ships. Mathematics-in-Industry Case Studies Journal, Volume 5, pp. 1-26

ESTEEM

- Oct 2021 - Member of the Editorial Board of Proceedings of the Edinburgh Mathematical Society (Subject Editor in Differential Equations)

- 2018– Present - Member of the London Mathematical Society

RESEARCH STUDENTS

- Wouter Scharpach (PhD at Technische Universiteit Eindhoven, Paesi Bassi) (current) (Role: "Co-Promoter" (Cosupervisor with Dr Bjoern Baumeier)
- Tomas Dutko: Solutions to a class of nonlinear Schrödinger equations involving a nonlocal term. (current) PhD (Role: Primary Supervisor)
- Megan Tyler: Existence and qualitative properties of solutions to nonlinear Schrödinger-Poisson systems (awarded 2020) PhD (Role: Primary Supervisor)
- Tomas Dutko: Some nonlinear problems with lack of compactness (awarded 2019) MSc by Research (Role: Primary Supervisor)
- Wedad Albalawi: Asymptotic behaviour of the ground state of quasilinear elliptic equation with a vanishing parameter (awarded 2017) PhD (Role: Coupervisor with Prof. V. Moroz
- Megan Goode: Concentration on circles for a class of Nonlinear Schrödinger equations (awarded 2015) MSc by Research (Role: Primary Supervisor)

SELECTED INVITED TALKS

27 April 2022	Workshop - Calculus of Variations and Nonlinear PDEs - Cardiff University (UK).
30 July 2019	XI Brazil-Italy Workshop in Nonlinear Differential Equations - Varese (Italy).
5 June 2019	Speaker at SALT Conference (Swansea University).
16 April 2019	Università di Roma Tor Vergata (Italy).
11 Sept 2018	UNAM (Mexico)
6 July 2018	Università degli Studi di Milano (Italy)
15 Jan 2018	African Istitute of Mathematical Sciences - (Senegal)
15 May 2017	UCL - Louvain la Neuve (Belgio)
28 Oc 2016	Riemann International School of Mathematics, Varese (Italy)
13 May 2016	ULB Bruxelles (Belgio)
4 Apr 2016	Maxwell Institute - University of Edinburgh (UK)
12 Nov 2015	University of Bath (UK)
1 Sep 2015	UNICAMP - Campinas (Brasil)
21 Aug 2015	USP Sao Paulo (Brasil)
17 Jan 2014	Warwick University (UK)
05 Nov 2013	Rutgers University (USA).
2 May 2012	Courant Institute of Mathematical Sciences - New York (USA)
7 Nov 2011	Centro De Giorgi - Pisa (Italia) during the school "Mathematical Principles for and Advances in Continuum Mechanics"
26 May 2011	Università di Roma "Sapienza" (Italia)
15 March 2011	ETH - Zurich (CH)
22 Oct 2010	UMA - Madrid (Spain)

SOME GRANTS

- £2000 (UK) Collaboration and Knowledge Exchange Support - M69 (Cherish Digital Economy Centre - European Funds) (2020)
- £1,800 (UK) London Mathematical Society travel grant - Collaboration with Developing Countries (2019)
- £800 (UK) London Mathematical Society travel grant - Research in Pairs (2019)
- £1000 (UK) Santander's staff mobility funding to support collaborations with Mexican mathematical community (2018)
- £1,740 (UK) London Mathematical Society travel grant - Collaboration with Developing Countries (2017)

- €1100 (EU) Univesité catholique de Louvain Research Visit Grant (2016)
- £1739 (UK) College of Science funding - Swansea University - to support a conference on Partial Differential Equations (2015)
- £1000 (UK) Santander's staff mobility funding to support collaborations with Brazilian mathematical community (2014)
- $3000 (US) Rutgers University Research Visit Grant (2013)

TEACHING EXPERIENCE

30/05–10/06 2022 PhD Course at Universitá di Roma Tor Vergata "On some classes of nonlinear and nonlocal elliptic PDEs on R^N"

2013 Module coordinator at Swansea University (UK):

- MA-311/M11 Partial Differential Equations - Second Semester, 2021/22
- MA-241 Differential Equations - First Semester 2021/22
- MA-386/M86 Calculus of Variations - Second Semester 2020/21
- MA-241 Differential Equations - First Semester 2020/21
- MA-241 Introduction to Ordinary Differential Equations - First Semester 2019/20
- MA-314/M14 (Ordinary) Differential Equations - Second Semester 2018/19
- MA-241 Introduction to Ordinary Differential Equations - First Semester 2018/19
- MA-121 Methods of Algebra and Calculus - First Semester 2017/18
- MA-314/M14 (Ordinary) Differential Equations - Second Semester 2016/17
- MA-121 Methods of Algebra and Calculus - First Semester 2016/17
- MA-311/M11 Partial Differential Equations - Second Semester 2015/16
- MA-121 Methods of Algebra and Calculus - First Semester 2015/16
- MA-003 Fundamental Algebra - Second Semester 2014/15
- MA-121 Methods of Algebra and Calculus - First Semester, 2014/15
- MA-311/M11 Partial Differential Equations - First Semester, 2013/14

Note: Module designer of MA-241 Differential Equations and MA-386/M86 Calculus of Variations at Swansea University

2013 - "Academic mentor" of (circa 5) undergraduate students every year at Swansea University (UK)

Sept-Oct 2012 Instructor for the module Calculus and Linear Algebra 2DN30. Technische Universiteit Eindhoven, (Nertherlands)

Apr-May 2012 Instructor for the module Vector calculus 2DM30. Technische Universiteit Eindhoven (Netherlands)

Sept 2011 - Jan 2012 Minicourse on Schrödinger's equation at Institute for Complex Molecular Systems e Department of Mathematics and Computer Science at Technische Universiteit Eindhoven (Netherlands)

Nov 2010 Minicourse on Some compactness results in Calculus of Variations and in Critical Point Theory held at International School for Advanced Studies - Trieste (Italy)

ORGANISER/COORGANISER

2018–2019 Organiser of the seminar series "Swansea Mathematical Sciences - Unplugged", (14 sessions) Swansea University.

8 June 2015 Organiser of workshop: "Abstract and applied perspectives in nonlinear partial differential equations" (Swansea University, UK)

ADMINISTRATION

2021 - 2022 "Deputy Programme Director - Student engagement and experience" for the Mathematics Department - Swansea University

2020 - 2022 "Final Year project coordinator" for the Mathematics Department - Swansea University

2015 - 2019 "Assessment Officer" e "Chair of the Examination Board" for the Mathematics Department - Swansea University

2013 - 2022 "Library liaison for the Mathematics Department" - Swansea University

MISCELLANEA

- Journal Referee per le riviste scientifiche: Analysis and Applications. Boundary Value Problems. Calculus of Variations and PDE. Communications in Contemporary Mathematics. Communications on Pure and Applied Mathematics. Communications in Partial Differential Equations. Discrete and Continuous Dynamical Systems. Israel Journal of Mathematics. Journal of Dynamical and Control Systems. Journal of Functional Analysis. Journal of Mathematical Analysis and Applications. Mathematical Methods in the Applied Sciences. Milan Journal of Mathematics. Nonlinearity. Nonlinear Analysis. Proceedings of the Royal Society of Edinburgh Section A: Mathematics. Proceedings of the London Mathematical Society. Journal of Mathematical Physics. Topological Methods in Nonlinear Analysis.
- Reviewer per FONDECYT Initiation into Research 2019, Chilean National Science and Technology Commission (CONICYT - Chile)