

Gianmarco BROCCHI

Curriculum Vitæ atque Studiorum

Updated: January, 2019

PERSONAL DETAILS

Born on 9th October 1990 in Taranto, Italy

ADDRESS:

School of Mathematics
University of Birmingham
Edgbaston, B15 2TT,
Birmingham

CITIZENSHIP: Italian

WEBSITE: gbrocchi.tk

EMAIL: g.brocchi@pgr.bham.ac.uk

RESEARCH INTERESTS: Real and Harmonic Analysis, in particular:
Fourier restriction theory, Sharp Strichartz estimates, and Sparse domination.

CURRENT POSITION: **PhD** student in PURE MATHEMATICS at University of Birmingham, UK
Supervisors: Dr. Maria Carmen Reguera and Prof. Jonathan Bennett

MAIN EDUCATION

SEPT 2017 M.Sc. in MATHEMATICS, **University of Bonn**, Germany
Thesis: “Sharp Fourier restriction theory and Strichartz estimates”
Advisor: Dr. Diogo OLIVEIRA E SILVA

2016–2017 Studies in MATHEMATICS, **University of Bonn**, Germany

2015–16 ERASMUS+ at **Friedrich-Wilhelms-Universität Bonn**, Germany

2014–15 Studies in MATHEMATICS, **University of Pisa**, Italy

OCT 2014 B.Sc. in MATHEMATICS, **University of Pisa**, Italy
Thesis: “Condizioni Tauberiane e Spazi di Hardy”
Advisor: Prof. Vladimir GEORGIEV

JUL 2009 High School Diploma
science liceum Ulisse Dini, Pisa, Italy

PUBLICATIONS AND PREPRINTS

- **Sharp Strichartz inequalities for fractional and higher order Schrödinger equations**, with *Diogo Oliveira e Silva* and *René Quilodrán*. arXiv:1804.11291.

RESEARCH[•] AND EXPOSITORY[◦] TALKS

- **A Nonlinear Plancherel theorem with applications to global well-posedness for the defocusing Davey-Stewartson equation and to the Inverse boundary value problem of Calderón** [7]
Sept 2018 | *Summer School on Unique Continuation and Inverse Problems*, Kopp, Germany
Presented with Xian Liao and Pavel Zorin-Kranich

- **Existence of extremizers for a Strichartz estimate for the 4th order Schrödinger equation**
July 2018 | *Mini-courses in Mathematical Analysis*, Padova, Italy
June 2018 | *BMC 2018* (speed talk), St Andrews, Scotland
May 2018 | ICMAT, Madrid, Spain
Apr 2018 | *BYMC 2018*, University of Birmingham, England
Feb 2018 | *Workshop on Harmonic analysis and Nonlinear Evolution Equations*, Pisa, Italy
Jul 2017 | Master Thesis seminar, Universität Bonn, Germany

- **Behaviour of the Schrödinger evolution for initial data near $H^{\frac{1}{4}}$** , after [2], [4]
Oct 2017 | *Summer School on Decoupling and Polynomial Methods in Analysis*, Kopp, Germany

- **Modulation spaces and Brownian motion**, after Árpád Bényi and Tadahiro Oh [1]
Jul 2017 | *Summer School on Harmonic Analysis and Partial Differential Equations*
BCAM, Bilbao, Spain
Jul 2017 | *Graduate seminar on Time-Frequency Analysis and Its Applications*,
Universität Bonn, Germany

- **Extremizers for Strichartz estimates for perturbed Schrödinger equations**, from [8]
Mar 2017 | *Atelier d'Analyse Harmonique*, University of Nantes, France

- **Endpoint Strichartz Estimates** [6]
Feb 2017 | *Course "Geometric Aspects of Harmonic Analysis"*, University of Bonn, Germany

- **Controlling rough paths**, after M. Gubinelli [5]. Presented together with Cristina Benea
Sept 2016 | *Summer School on Paraproducts and Analysis of Rough Paths*, Kopp, Germany

- **Asymptotics, frequency modulation, and low regularity ill-posedness for canonical defocusing equations** [3]
Dec 2015 | *Graduate seminar on Nonlinear Fourier Transform*, University of Bonn, Germany

TALKS REFERENCES

- [1] Árpád Bényi and Tadahiro Oh. "Modulation spaces, Wiener amalgam spaces, and Brownian motions". In: *Adv. Math.* 228.5 (2011), pp. 2943–2981.
- [2] Lennart Carleson. "Some analytic problems related to statistical mechanics". In: *Euclidean harmonic analysis (Proc. Sem., Univ. Maryland, College Park, Md., 1979)*. Vol. 779. Lecture Notes in Math. Springer, Berlin, 1980, pp. 5–45.
- [3] Michael Christ, James Colliander, and Terence Tao. "Asymptotics, frequency modulation, and low regularity ill-posedness for canonical defocusing equations". In: *Amer. J. Math.* 125.6 (2003), pp. 1235–1293.
- [4] Björn E. J. Dahlberg and Carlos E. Kenig. "A note on the almost everywhere behavior of solutions to the Schrödinger equation". In: *Harmonic analysis (Minneapolis, Minn., 1981)*. Vol. 908. Lecture Notes in Math. Springer, Berlin-New York, 1982, pp. 205–209.
- [5] M. Gubinelli. "Controlling rough paths". In: *J. Funct. Anal.* 216.1 (2004), pp. 86–140.
- [6] Markus Keel and Terence Tao. "Endpoint Strichartz estimates". In: *Amer. J. Math.* 120.5 (1998), pp. 955–980.
- [7] A. I. Nachman, I. Regev, and D. I. Tataru. *A Nonlinear Plancherel Theorem with Applications to Global Well-Posedness for the Defocusing Davey-Stewartson Equation and to the Inverse Boundary Value Problem of Calderon*. Preprint. 2017.
- [8] Diogo Oliveira e Silva and René Quilodrán. "On extremizers for Strichartz estimates for higher order Schrödinger equations". In: *Trans. Amer. Math. Soc.* 370.10 (2018), pp. 6871–6907.

CONFERENCES, SCHOOLS AND WORKSHOPS

A list of recent conferences/workshops can be found online on the website.

Partial (◇) or full (◆) financial support received from the institution is indicated.

<i>Feb 2018</i> Institution	<i>Workshop on Harmonic analysis and Nonlinear Evolution Equations</i> ◆ Università di Pisa, Italy
<i>Dec 2017</i> Institution	<i>LMS Network on Harmonic Analysis and PDEs</i> University of Warwick, UK
<i>Sept 2017</i> Institution	<i>Summer School in Harmonic Analysis, PDE and Spectral theory</i> ◇ Università La Sapienza, Roma, Italy
<i>Sept 2017</i> Institution	<i>Metric Measure Spaces and Ricci Curvature</i> Max Plank Institute, Bonn, Germany
<i>Jul 2017</i> Institution	<i>Harmonic analysis and its interactions: in honour of Tony Carbery</i> ◆ ICMS, University of Edinburgh, UK
<i>Jul 2017</i> Institution	<i>Third Summer School on Harmonic Analysis and Partial Differential Equations</i> ◇ BCAM, Bilbao, Spain
<i>Mar 2017</i> Institution	<i>Atelier d'Analyse Harmonique</i> ◆ University of Nantes, France
<i>Dec 2016</i> Institution	<i>Workshop "Young Women in Harmonic Analysis and PDE"</i> Universität Bonn, Germany
<i>Nov 2016</i> Institution	<i>Fall School on "PDEs and Probability"</i> AIMS, Mbour, Senegal. ◆ DAAD grant
<i>Oct 2016</i> Institution	<i>Workshop: New trends in Partial Differential Equations</i> Centro di Ricerca Ennio De Giorgi, Pisa, Italy
<i>Sept 2016</i> Institution	<i>PISA-HOKKAIDO Summer School: Mathematics and Its Applications</i> University of Pisa and Scuola Normale Superiore, Pisa, Italy
<i>Sept 2016</i> Institution	<i>Summer School on Paraproducts and Analysis of Rough Paths</i> ◇ Universität Bonn, Kopp, Germany
<i>Jul 2016</i> Institution	<i>Summer School on Spectral theory and applications</i> ◆ Université Laval, Québec City, Canada
<i>Oct 2015</i> Institution	<i>Conference "Panorama of Mathematics"</i> Hausdorff Center, Bonn, Germany
<i>Aug 2015</i> Institution	<i>Summer School on Differential Equations and Differential Geometry</i> ◇ Hokkaido University, Sapporo, Japan
<i>Jul 2015</i> Institution	<i>Summer School on Mathematical and Statistical Models of Economic Growth</i> ◇ Hokkaido University, Sapporo, Japan

TEACHING EXPERIENCE

As **Teaching assistant** at the University of Birmingham

<i>Spring</i> 2019	<i>Numerical Methods & Programming</i> <i>Year 1 Mathematics</i> <i>Engineering Mathematics (Marking)</i>	<i>Winter</i> 2018	<i>Continuum Mechanics</i> <i>Year 1 Mathematics</i> <i>Engineering Mathematics (Marking)</i>
<i>Spring</i> 2018	<i>Methods in Partial Differential Equations</i> <i>Mathematics in Industry</i>	<i>Winter</i> 2017	<i>Continuum Mechanics</i> <i>Mathematical Modelling and Problem Solving</i>

As **Teaching assistant** at the University of Pisa

<i>May – Jul</i> 2015	<i>Complementi di Analisi Matematica</i> Department of Energy, Systems, Territory and Construction Engineering, University of Pisa, Italy
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Extras activities

<i>2017-present</i>	Volunteer in the <i>Maths Support Center</i> ¹
<i>Feb 2015</i>	Tutor at <i>XI Settimana Matematica</i> ²
<i>Feb 2012</i>	Tutor at <i>VIII Settimana Matematica</i>

LANGUAGES

ITALIAN (reading, listening, speaking, writing): mother-tongue.

ENGLISH (reading, listening, speaking, writing): fluent.

2015: B2 certificate issued by C.L.I - Centro Linguistico Interdipartimentale, University of Pisa, Italy.

GERMAN (reading, listening, speaking, writing): basic.

2016: A2 certificate issued by International Office, Universität Bonn, Germany.

COMPUTER SKILLS

Advanced Knowledge:	GNU/LINUX, Bash, \LaTeX , HTML, CSS
Intermediate Knowledge:	C, Python, FORTRAN, git, \LaTeX BEAMER, OCTAVE
Basic Knowledge:	OCAML, C++, Vala

OTHER INTERESTS AND ACTIVITIES

<i>Aug 2016</i> Institution	Participation in GUADEC , the GNOME Conference Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
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Workshop: Packaging your application using Flatpak
Tutors: *Alexander Larson* (Red Hat) and *David King* (Red Hat)

<i>Oct 2012</i> Institution	Speaker at LinuxDay , <i>Italian event to promote GNU/Linux and Free Software</i> University of Pisa, Italy
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<i>Oct 2010</i> Institution	Participation in GUITmeeting , <i>the \TeX and \LaTeX Italian users meeting</i> Scuola Superiore Sant'Anna, Pisa, Italy
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Member of PHC.

¹Drop-in support aimed at foundation and first-year undergraduate students.

²Open week at the Department of Mathematics, University of Pisa, Italy.