

Gianmarco BROCCHI

Updated: September, 2020

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

CURRENT POSITION: **PhD** student in PURE MATHEMATICS

Supervisors: Dr. Maria Carmen Reguera

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

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

PUBLICATIONS AND PREPRINTS

- **Quadratic sparse domination and Weighted Estimates for non-integral Square Functions**, with Julian Bailey and Maria Carmen Reguera, arxiv:2007.15928, Submitted.
- **A sparse quadratic T_1 theorem**, arxiv:2004.05365, To appear in the *New York Journal of Mathematics*.
- **Sharp Strichartz inequalities for fractional and higher order Schrödinger equations**, with Diogo Oliveira e Silva and René Quilodrán, *Analysis & PDE* 13 (2020) 477-526. DOI: 10.2140/apde.2020.13.477.

ORGANISED WORKSHOPS

June 2019 **Harmonic Analysis in non-homogeneous settings and applications**
with Julian Bailey and Maria Carmen Reguera

Apr 2019 **British Young Mathematicians Colloquium 2019**
with Alexander Brune, Jen Duncan, Cara Neal, Jack Saunders, Karoline van Gemst

TALKS

- **Sparse T_1 theorems**
 - Jul 2020 | *British Early Career Mathematicians' Colloquium*, (virtual colloquium)
 - Jun 2020 | *Virtual Harmonic Analysis Seminars*, UK Harmonic Analysis group, on Zoom
- **Random shifted dyadic grids and what they can do for you**
 - May 2020 | *Analysis & PDE Working Seminar*, University of Minnesota, on Zoom
- **The Bourgain–Milman (via Hörmander’s) theorem, [1]**
 - Oct 2019 | *Summer School on Sphere Packings and Optimal Configurations*, Kopp, Germany
Presented with Constantin Bilz
- **What does extremise a Strichartz estimate?**
 - Mar 2019 | *Pure Maths Postgraduate Seminar*, University of Sheffield, UK
- **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, [2]**
 - 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
 - July 2017 | *Master Thesis seminar*, Universität Bonn, Germany
- **Behaviour of the Schrödinger evolution for initial data near $H^{\frac{1}{4}}$, [3], [4]**
 - Oct 2017 | *Summer School on Decoupling and Polynomial Methods in Analysis*, Kopp, Germany
- **Modulation spaces and Brownian motion, [5]**
 - July 2017 | *Summer School on Harmonic Analysis and Partial Differential Equations*
BCAM, Bilbao, Spain
 - July 2017 | *Graduate seminar on Time-Frequency Analysis and Its Applications*,
Universität Bonn, Germany
- **Extremizers for Strichartz estimates for perturbed Schrödinger equations, [6]**
 - Mar 2017 | *Atelier d'Analyse Harmonique*, University of Nantes, France
- **Controlling rough paths, [7]. Presented with Cristina Benea**
 - Sept 2016 | *Summer School on Paraproducts and Analysis of Rough Paths*, Kopp, Germany

RESEARCH[•] AND EXPOSITORY[◦] TALKS. REFERENCES

- [1] F. Nazarov, in , Vol. 2050, Lecture Notes in Math. (Springer, Heidelberg, 2012), pp. 335–343.
- [2] A. I. Nachman, I. Regev, and D. I. Tataru, 2017.
- [3] L. Carleson, in, Vol. 779, Lecture Notes in Math. (Springer, Berlin, 1980), pp. 5–45.
- [4] B. E. J. Dahlberg and C. E. Kenig, in, Vol. 908, Lecture Notes in Math. (Springer, Berlin-New York, 1982), pp. 205–209.
- [5] Á. Bényi and T. Oh, *Adv. Math.* **228**, 2943 (2011).
- [6] D. Oliveira e Silva and R. Quilodrán, *Trans. Amer. Math. Soc.* **370**, 6871 (2018).
- [7] M. Gubinelli, *J. Funct. Anal.* **216**, 86 (2004).

CONFERENCES, SCHOOLS AND WORKSHOPS

- Sept 2019* **Summer School on Sphere Packings and Optimal Configurations**
Kopp, Germany. ◇ Hausdorff Center
- July 2019* **4th BCAM-UPV/EHU summer school on harmonic analysis and PDEs: Restriction theory.** Bilbao, Spain
- June 2019* **Mini-courses in Mathematical Analysis**
University of Padova, Italy
- May 2019* **Lectures in Fourier Analysis. A conference in honour of Andreas Seeger**
☆ University of Madison, Wisconsin
- Feb 2019* **Explorations in Harmonic Analysis and other realms.** A conference honoring Alexander Olevskii's 80th birthday
☆ Weizmann Institute of Science, Israel
- Sept 2018* **Summer School on Unique Continuation and Inverse Problems**
Kopp, Germany. ◇ Hausdorff Center ◇ UoB
- July 2018* **Mini-courses in Mathematical Analysis**
University of Padova, Italy
- June 2018* **Geometric Aspects of Harmonic Analysis: a conference on the occasion of Fulvio Ricci's 70th birthday**
Cortona, Italy ◇ INDAM
- June 2018* **British Mathematical Colloquium 2018**
St Andrews, Scotland ◇ LMS
- May 2018* **Real HA and its Applications to PDEs and GMT: on the occasion of the 60th birthday of Steve Hofmann** ◇ ICMAT, Madrid
- Apr 2018* **British Young Mathematicians Colloquium 2018**
University of Birmingham
- Apr 2018* **Young Researchers Workshop in Harmonic Analysis**
Politecnico di Torino, Italy
- Feb 2018* **Workshop on Harmonic analysis and Nonlinear Evolution Equations**
☆ Università di Pisa, Italy
- Dec 2017* **LMS Network on Harmonic Analysis and PDEs** University of Warwick, UK
- Sept 2017* **Summer School in Harmonic Analysis, PDE and Spectral theory**
◇ Università La Sapienza, Roma, Italy
- July 2017* **Harmonic analysis and its interactions: in honour of Tony Carbery**
☆ ICMS, University of Edinburgh, UK
- July 2017* **Third Summer School on Harmonic Analysis and Partial Differential Equations** ◇ BCAM, Bilbao, Spain
- Mar 2017* **Atelier d'Analyse Harmonique**
☆ University of Nantes, France
- Dec 2016* **Workshop "Young Women in Harmonic Analysis and PDE"**
Universität Bonn, Germany
- Nov 2016* **Fall School on "PDEs and Probability"**
AIMS, Mbour, Senegal. ☆ DAAD grant
- Oct 2016* **Workshop: New trends in Partial Differential Equations**
Centro di Ricerca Ennio De Giorgi, Pisa, Italy
- Sept 2016* **Mathematics and Its Applications PISA-HOKKAIDO Summer School**
University of Pisa and Scuola Normale Superiore, Pisa, Italy
- Sept 2016* **Summer School on Paraproducts and Analysis of Rough Paths**
Kopp, Germany ◇ Hausdorff Center
- July 2016* **Summer School on Spectral theory and applications**
☆ Université Laval, Québec City, Canada
- Aug 2015* **Summer School on Differential Equations and Differential Geometry**
◇ Hokkaido University, Sapporo, Japan
- July 2015* **Summer School on Mathematical and Statistical Models of Economic Growth**
◇ Hokkaido University, Sapporo, Japan

¹Partial◇ and full☆ financial support received from the institution is acknowledged.

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
--------------------------	---

Extras activities

2017-2020	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
--------------------------------	--

<i>Oct 2012</i> Institution	Speaker at LinuxDay , <i>Italian event to promote GNU/Linux and Free Software</i> University of Pisa, Italy
--------------------------------	--

<i>Oct 2010</i> Institution	Participation in GUITmeeting , <i>the \TeX and \LaTeX Italian users meeting</i> Scuola Superiore Sant'Anna, Pisa, Italy
--------------------------------	--

Member of **PHC**.

¹Drop-in support aimed at undergraduate students.

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