Ana Emilia de Orellana

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University of St Andrews

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EDUCATION

School of Mathematics and Statistics, University of St Andrews   *Sep. 2023 - Present*
PhD in Mathematics

    Dissertation Title: *On the Fourier Spectrum and its Applications.*
    Supervisors: Prof. Jonathan M. Fraser, Regius Prof. Kenneth J. Falconer.

Facultad de Ingeniería Química, Universidad Nacional del Litoral   *Feb. 2018 - Mar. 2023*
Licentiate Degree in Mathematics (equivalent to M.Sc.)
GPA: 8.68/10, part of the honour board.

    Dissertation Title: *Homogeneous Type Spaces and Metrisation.*
    Supervisors: Dr. Marisa Toschi, Dr. Mauricio Ramseyer.
    Keywords: Muckenhoupt weights, spaces of homogeneous type, Hardy–Littlewood maximal operator.

PUBLICATIONS

· L^2 restriction estimates from the Fourier spectrum, with M. Carnovale and J. M. Fraser. 2024. arXiv: 2412.14896.

· Obtaining the Fourier spectrum via Fourier coefficients, with M. Carnovale and J. M. Fraser. *Proceedings of the American Mathematical Society* (to appear). arXiv: 2403.12603.

· A Fourier analytic approach to exceptional set estimates for orthogonal projections, with J. M. Fraser. *Indiana University Mathematics Journal* (to appear). arXiv: 2404.11179.

TALKS

· Fourier Restriction and Fractal Dimensions.
Workshop on Regularity Theory of PDEs and Calculus of Variations, University of Essex, UK.   *Jun. 2025*

· Extending the Stein–Tomas Theorem.
Workshop in Harmonic Analysis and PDEs, University of St Andrews, UK.   *Apr. 2025*

· Dimension Interpolation and Restriction Theorems.
Young Functional Analysts' Workshop, University of Glasgow, UK.   *Apr. 2025*

· Fourier Restriction for Multifractals.
Ergodic Theory and Dynamical Systems Seminar, University of Bristol, UK.   *Mar. 2025*

· A New Perspective on the Stein–Tomas Theorem.
One World Fractals (online).   *Nov. 2024*

· Fourier Analytic Methods for Orthogonal Projections.
Analysis Seminar, Shenzhen Technology University, China (online talk).   *Oct. 2024*

· Orthogonal Projections and a Continuum of Dimensions.
Analysis Seminar, University of Birmingham, UK.   *Oct. 2024*

· Dimension Interpolation and Exceptional Set Estimates.
Analysis Seminar, University of Edinburgh, UK.   *Sep. 2024*

· The Continuity of Exceptional Estimates for Orthogonal Projections. Fractal Geometry and Stochastics 7, Chemnitz, Germany.	*Sep. 2024*
· Orthogonal Projections and the Fourier Spectrum. Workshop on Fourier Analysis, Fractals, and Finite Fields, University of St Andrews, UK.	*Sep. 2024*
· Projection Theorems for the Fourier Spectrum. Workshop on the Geometry of Deterministic and Random Fractals II, Rényi Institute, Budapest, Hungary.	*Sep. 2024*
· Fourier Analysis for Fractal Measures. Workshop on Ergodic Theory and Fractal Geometry, University of Loughborough, UK.	*Jul. 2024*
· Exceptional Projections and Dimension Interpolation. Geometry and Fractals under the Midnight Sun Conference, University of Oulu, Finland.	*Jun. 2024*

EVENTS ORGANISED

· Harmonic Analysis and PDEs Workshop at the University of St Andrews. One day workshop for the LMS funded HAPDE Network. Co-organised with Jonathan Fraser.	*8th Apr. 2025*
· Pure PhD Seminar at the University of St Andrews. Seminar series given by PhD students of the Analysis, Algebra, and Geometry research groups Co-organised with Violeta Lopez (Geometry PhD student).	*Sep. 2025 - May 2026*

Analysis Reading Groups

· Topics in Fractal Geometry, Harmonic Analysis, and Dynamical Systems.	*Sep.-Dec. 2024*
· A short proof of the multilinear Kakeya conjecure.	*Sep.-Dec. 2025*

AWARDS

· St Leonard's College Scholarship, University of St Andrews. Funding to attend the 'Workshop on Ergodic Theory and Fractal Geometry' at the University of Loughborough.	*Jul. 2024*
· Santander Development Fund Scholarship. Funding to attend the 'Geometry and Fractals under the Midnight Sun Conference' at the University of Oulu.	*Jun. 2024*
· University of St Andrews - Handsel Scholarship for PhD in Mathematics.	*Sep. 2023 - Mar. 2027*
· Second place in the National Monograph competition held by the Argentinian Mathematical Union. Title: 'Knot Theory'.	*Sep. 2019*

EXPERIENCE

Academic Tutor and Demonstrator *Sep. 2023 - Dec. 2025*

Tutor at the University of St Andrews for a variety of pure and applied undergraduate mathematics modules. Marking summative and formative assessment for over 250 students. Demonstrator for over 550 students in examples classes.

Lecturer *Feb. 2023*

Lecturer at the Universidad Nacional del Litoral's 'Summer School' for entrance level students studying core mathematics modules. Lectured two groups of 70 students twice per week in two-hour sessions.

Teaching Assistant *Aug. 2022 - Mar. 2023*

Teaching assistant at Universidad Nacional del Litoral for first-year level undergraduate students.

Educational outreach *Mar. 2017 - Dec. 2018*

Collaborating with the Universidad Nacional del Litoral, providing one-to-one tuition in a variety of STEM subjects to less affluent members of the community.

Programming

Python, MatLab, Mathematica, R, Shiny-r, HTML, CSS, JavaScript.

REFERENCES

· Prof. Jonathan Fraser: jmf32@st-andrews.ac.uk

· Regius Prof. Kenneth Falconer: kjf@st-andrews.ac.uk

· Prof. Jonathan Bennett: j.bennett@bham.ac.uk