

Ana Emilia de Orellana

<https://anadeore.github.io>

University of St Andrews

St Andrews ◊ KY16 9SS ◊ aedo1@st-andrews.ac.uk

## 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

- Fourier restriction for the additive Brownian sheet, with J. M. Fraser. 2026. arXiv: 2601.05802.
  - $L^2$  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 conjecture. *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](mailto:jmf32@st-andrews.ac.uk)
- Regius Prof. Kenneth Falconer: [kjf@st-andrews.ac.uk](mailto:kjf@st-andrews.ac.uk)