

# Justin Trias

## Curriculum vitae

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### Employment

- 2023–2025 **Senior Research Associate**, *University of East Anglia (UEA)*, Norwich  
Co-Investigator on the EPSRC grant mentioned below.
- 2021– 2023 **Research Associate**, *Imperial College*, London  
Postdoctoral researcher, working with David Helm.
- 2019–2021 **Senior Research Associate**, *UEA*, Norwich  
Postdoctoral researcher, working with Shaun Stevens.

### Educational background

- 2015–2019 **PhD**, *Sorbonne Université (formerly UPMC)*,  $\ell$ -modular theta correspondence  
Done under the supervision of Alberto Mínguez. Additional tasks including science mediation the first year, and teaching the years after. Financed by the doctoral school of Paris.
- 2013–2015 **Master**, *UPMC*, Fundamental mathematics  
Held in September 2015. Master thesis done under the supervision of Benoît Stroh.  
**Master 2nd year LOPHISS**, *Paris Diderot*, Logic, Philosophy, History, Sociology of Sciences  
In parallel to the master of mathematics.
- 2012–2013 **Aggregation of mathematics**, *ENS Cachan*  
Competitive examination to become teacher. Accepted and ranked 82nd.

### Research grant

- 2022 **EPSRC Research Grant EP/V061739/1**, *Local theta correspondence: a new study through the theories of types and  $l$ -modular representations*, Funded Value: £417 076  
Research Co-Investigator on this grant, Shaun Stevens being the Principal Investigator of this project. It includes the organisation of a conference and a workshop.

### Dissertation

- 2019 **Doctoral thesis:  $\ell$ -modular theta correspondence**  
Done under the supervision of Alberto Mínguez. Defended in October 2019.

### Memoirs and research trainings

- 2015 **Master's Thesis: number theory**, *UPMC*, Paris  
Thesis done under the supervision of Benoît Stroh studying a paper of Henri Darmon about the modularity of fibres of certain rigid local systems.
- 2012 **Research training: theoretical physics**, *IPhT*, CEA Saclay  
I worked on quantum chaos under the advisement of Stéphane Nonnenmacher.
- 2011 **Research training: shape optimisation**, *CMLA*, ENS Cachan  
Initiation to research in mathematics with a part time work over 6 months supervised by Alain Trounev.

## Research papers

- 2022 **Whittaker functionals and contragredient in characteristic not  $p$** , with Nadir Matringe, arXiv:2209.15353, 10 pages, to appear in MRL  
Generalisation to  $\ell$ -modular representations of the work of François Rodier on unicity of Whittaker models for reductive groups over a  $p$ -adic field.
- 2021 **Universal Weil Module**, arXiv:2103.04840, 36 pages, to appear in Pacific Journal of Mathematics  
Looking at Weil modules in families with coefficients over minimal rings.
- 2020 **Correspondance thêta locale  $\ell$ -modulaire I : groupe métaplectique, représentation de Weil et  $\Theta$ -lift**, arXiv:2009.11561, 91 pages  
Generalising the first part of my thesis work, with some improvements involving changing coefficients fields.

## Research in preparation

- 2023  **$\ell$ -modular local theta correspondences between cuspidal representations**, with Jia-Jun Ma, Hung Yean Loke and Shaun Stevens  
Explicit theta correspondence between cuspidal representations in the modular setting using the theory of types.
- 2023 **Towards a theta correspondence in families for type II dual pairs**, with Gil Moss  
Formulating a theta correspondence in families for type II dual pairs as well as some new directions involving its geometry.

## Talks

- Jun. 2022 **Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *Séminaire Arithmétique*, Laboratoire Paul Painlevé, Université de Lille
- Jun. 2022 **Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *Representation Theory and Automorphic Forms seminar*, University of Vienna
- Jun. 2022 **Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *London number theory seminar*, King's College London
- Jun. 2022 **Lecture series: Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *Local team seminar*, Imperial College London
- Apr. 2022 **Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *Workshop: minimal representations and theta correspondence*, Erwin Schrödinger International Institute for Mathematical Physics, Vienna
- Feb. 2022 **Towards a theta correspondence in families for type II dual pairs (with Gil Moss)**, *Séminaire Groupes, Algèbre et Géométrie*, Laboratoire de Math. et Applications, Université de Poitiers
- Mar. 2021 **Towards an integral local theta correspondence**, *Representation Theory and Number Theory Seminar*, Department of Mathematics, University of Utah
- Feb. 2021 **Towards an integral local theta correspondence**, *Number Theory Seminar*, Department of Pure Mathematics and Mathematical Statistics, University of Cambridge
- Nov. 2019  **$\ell$ -modular theta correspondence**, *Pure Maths Seminar*, University of East Anglia, Norwich
- Jul. 2019  **$\ell$ -modular theta correspondence**, *Séminaire d'Algèbre et Géométrie*, Laboratoire de mathématique de Versailles, Université de Versailles Saint-Quentin-en-Yvelines
- Jun. 2019  **$\ell$ -modular theta correspondence**, *Séminaire groupes réductifs et formes automorphes*, Séminaire d'équipe de l'IMJ-PRG, Sorbonne Université

Mar. 2019  **$\ell$ -modular theta correspondence**, *Number theory seminar*, Faculty of mathematics, University of Vienna

## Teaching duties and outreach

- 2022–2023 **Lecturing**, *Masters of Science*, Imperial College, London  
Elliptic Curves course for masters students.
- 2022–2023 **Tutoring**, *Year 1*, Imperial College, London  
Running two Year 1 tutorial groups over the whole year.
- 2020–2021 **Lecturing**, *Algebra II*, UEA, Norwich  
Ring theory for second year students.
- 2018–2019 **Tutoring**, *Sorbonne Université (SU)*, Paris  
I did oral examinations in differential calculus for last year bachelor students, as well as tutorials in algebra.
- Dec. 2018 **Lecturing**, *Topology and differential calculus*, African Institute for Mathematical Sciences (AIMS), M'bour (Senegal)  
Thanks to a joint program between SU and the Senegal-based centre of AIMS, I had the opportunity to give a 15-lecture master's course in Africa as part of my teaching duties.
- 2017–2018 **Tutoring**, *Algebra: group theory*, SU, Paris  
Tutorials as well as oral examinations for final year bachelor students.
- 2016–2017 **Tutoring**, UPMC (now SU), Paris  
I did the tutorials for second year bachelor students in "Sequences, series and integrals" as well as lecture-tutorials on the software Mathematica for first years students.
- 2015–2016 **Science mediator**, Cité des Sciences, Paris  
My doctoral contract allowed me to have this experience in one of the big science museum of Paris, and even of France. It consisted in helping prepare scientific outreach activities and to present them, in front of schools as well as in public.

## Mathematical life

- 2020–2021 **Pure Maths Seminar**, UEA  
Organised in collaboration with V. Aslanyan and K. Hristova.
- 2016–2018 **Séminaire des thésards**, IMJ-PRG  
This seminar was about general mathematics, and giving an opportunity to PhD students to have a first talk in a kindly atmosphere. I was organising it with other PhD students.
- 2016–2018 **Rencontres masters-doctorants**, IMJ-PRG  
Bi-annual reunion financed by the university and the IMJ-PRG, I co-initiated. Friendly moment for PhD and master students to meet and chat, involving short research talks followed up with a drink.
- 2016–2017 **Séminaire Aromaths**, UPMC, Paris  
I was part of the organising team of this seminar dedicated to bachelor students. I help them as much as I can today, as I have got other responsibilities.

## Language skills

- French Mother tongue
- English Fluent
- Spanish Good level
- Chinese Studied in high school, succeeding in the final oral examination