

# Simon MACHADO

*Institute for Advanced Study, Princeton*  
✉ machado@ias.edu



## Employment

- 2023-2026 **Hermann-Weyl Instructor**,  
*ETH, Zurich.*  
Mentor: Marc Burger
- 2022-2023 **Member at the Institute for Advanced Studies**,  
*IAS, Princeton.*  
Special year on Dynamics, Additive Number Theory and Algebraic Geometry.

## Education

- 2018-2022 **PhD candidate in Pure Mathematics**,  
*University of Cambridge.*  
Supervisor: Prof. Emmanuel Breuillard.
- 2017-2018 **Master's degree - Pure Mathematics "Analysis, Arithmetic, Geometry"**,  
*Université Paris-XI, Paris, France.*  
Obtained with highest honours.
- 2015-2017 **Bachelor's degree in Pure Mathematics**,  
*École normale supérieure & Université Paris Diderot, Paris, France.*  
Obtained with highest honours.
- 2013-2015 **Classe préparatoire aux Grandes Écoles in Mathematics and Physics**,  
*Lycée Louis-Le-Grand, Paris, France.*

## Publications & Preprints

- 2022 Simon Machado, Appendix to "Foundations of geometric approximate group theory" by Cordes, Hartnick and Tonić. *Arxiv preprint*, <https://arxiv.org/abs/2012.15303>.
- 2021 Simon Machado, Approximate Lattices in Higher-Rank Semi-Simple Groups. *Submitted*, <https://arxiv.org/abs/2011.01829>.
- 2020 Simon Machado, Closed approximate subgroups: compactness, amenability and approximate lattices. *Submitted*, <https://arxiv.org/abs/2011.01829>.
- 2019 Simon Machado, Infinite approximate subgroups of soluble Lie groups. *Math. Ann.* (2021). <https://doi.org/10.1007/s00208-021-02258-8>.
- 2018 Simon Machado, Approximate lattices and Meyer sets in nilpotent Lie groups. *Discrete Analysis* 2020:1, 18 pp. DOI: <https://doi.org/10.19086/da.11886>.

## Research talks

- 2022 **Approximate lattices in linear groups**, *Yale university*.

- 2022 **Approximate lattices in linear groups**, *Workshop on additive combinatorics and algebraic connections, Institute for Advanced Study.*
- 2022 **When are discrete subsets of Lie groups approximate subgroups? Around a theorem of Lagarias**, *Copenhagen–Jerusalem Combinatorics seminar.*
- 2022 **Superrigidity and arithmeticity for some aperiodic subsets in higher-rank simple Lie groups**, *New England seminar of Ergodic Theory.*
- 2022 **Arithméticité et superrigidité de certains ensembles apériodiques en rang supérieur.**, *Séminaire de théorie ergodique, Université de Rennes.*
- 2022 **Commensurator superrigidity for approximate lattices**, *Kazhdan's seminar.*
- 2021 **Approximate lattices in higher rank simple Lie groups**, *Ergodic Theory and Dynamical Systems seminar, Zurich.*
- 2021 **Approximate Subgroups, Meyer Sets and Arithmeticity**, *CanADAM 2021.*
- 2021 **Discrete approximate subgroups of linear algebraic groups**, *KTH Wednesday Zoom seminar, Stockholm.*
- 2021 **Sous-groupes approximatifs discrets des groupes de Lie**, *Seminaire virtuel francophone Groupes et Geometrie.*
- 2021 **Approximate lattices and Meyer sets: structure of certain infinite approximate groups**, *Oxford logic seminar.*
- 2021 **Meyer-type theorems for approximate lattices**, *Seminaire de logique Lyon-Paris.*
- 2020 **Approximate lattices in amenable groups**, *Geometric Group Theory seminar, University of Cambridge.*
- 2020 **On some classes of infinite approximate subgroups**, *MFO Workshop "Model Theory: Groups, Geometries and Combinatorics".*
- 2019 **Good models for infinite approximate subgroups**, *MFO Workshop "Groups, Dynamics and Approximation".*

## Teaching & Outreach

### Teaching

- 2020-2021 Supervisions in Part IIA Groups, Rings and Modules, *University of Cambridge.*
- 2018-2019 Supervisions in Part IIB Number Theory, *University of Cambridge.*
- 2015-2018 Colles in mathematics in classes préparatoires, *Lycée Louis-Le-Grand, Paris, France.*  
Teaching Assistant at undergraduate level (year 1 & 2 of undergraduate studies).

### Outreach

- 2018-2019 Volunteering for the International Tournament of Young Mathematicians (ITYM).  
Organising committee, public relations and scientific committee of an international mathematical tournament at highschool/sixth form level.
- July 2017 Teaching at the summer camp in Bethlehem held by the Al-Khwarizmi–Noether Institute,  
*Bethlehem, West Bank, Palestine.*  
Teaching Olympiad-oriented problem solving to year 12 to 14 children.
- 2016-2017 Volunteering at Parimaths, *Paris, France.*  
Lectures about current trends in mathematics to highschool/sixth form students. Organisation and teaching roles.
- 2015-  
current Volunteering for the French Tournament of Young Mathematicians (TFJM), *Association Animaths, Paris, France.*  
Organisation committee and scientific committee of a nationwide mathematical tournament at highschool/sixth form level.

## Services

- 2021-2022 Organisation of a discussion group, *University of Cambridge*.  
Organization of a discussion group on various topics related to the interests of researchers within Prof. Varju's group.
- 2021 Organization, The Informal Seminar, *University of Cambridge*.  
Organization of a seminar meant for some PhD candidates, post-docs and academic staff that arrived at the University of Cambridge during the pandemic.
- 2020 Chair part III seminars, *University of Cambridge*.  
Chairing and providing feedback to Master's student about talks on their dissertation subject.
- 2020 Talk at the open days of the CMI PhD program, *University of Cambridge*.

## Languages

- French: Mother tongue
- English: Fluent

## Interests

Cinema - Climbing - Skiing.

**References** - available upon request