Joshua Ciappara | CV

📱 0451 588 331   •   ✉ joshua.ciappara@sydney.edu.au

Education

○ **University of Sydney** − *PhD (Mathematics)*   *10/2018–present*
Supervised by Prof. Geordie Williamson and A/Prof. Oded Yacobi for a project in geometric and categorical representation theory, "Actions of the Hecke category".

○ **University of Oxford** − *MSc by Research (Mathematics)*   *10/2016–10/2018*
Supervised by Prof. Konstantin Ardakov for a project in rigid geometry, "Invariants of $\widehat{D}$-modules". Courses taken: Lie Algebras I & II, Elliptic Curves, Lie Groups, and Analytic Number Theory.

○ **University of Sydney** − *BSc (Advanced Mathematics) (Hons.)*   *02/2012–11/2015*
First class honours with the University Medal. Honours project "Categorifying $U_q(\mathfrak{sl}_2)$ via the Cohomology of Partial Flag Varieties", supervised by A/Prof. Yacobi. Honours courses in Commutative Algebra, Algebraic Topology, Topological Groups, Spectral Theory, Algebraic Curves, and Complex Measure Theory.

Employment

○ **University of Sydney** − *Research assistant*   *05/2021–present*
Mathematical editor for a forthcoming book on group theory by Prof. Stephan Tillmann

○ **University of Sydney** − *Postgraduate teaching fellow*   *07/2019–present*
Taught and marked classes for Multivariable Calculus and Modelling (MATH1023) and Analysis (MATH2023); taught classes and designed course materials for Discrete Mathematics (MATH1004); lectured, designed course materials, and set exams for Linear Algebra (MATH1002)

○ **University of Sydney** − *Lecturer*   *12/2020–03/21*
Gave lectures for and coordinated the Introduction to Linear Algebra (MATH1014) summer course, overseeing administration, student assessment, marking, and the running of course tutorials

○ **University of Sydney** − *Tutor*   *02/2019–07/2019*
Taught classes for Linear Algebra (MATH1002) and Metric Spaces (MATH3961), including the grading of tests and assignments

○ **University of Oxford** − *Teaching assistant*   *10/2016–11/2017*
Marked homework, presented solutions, and gave one-on-one tutoring for classes in Representation Theory (B2.1) and Set Theory (B1.2). Helped to mark the 2017 Mathematics Admissions Test.

○ **University of Sydney** − *Tutor*   *02/2015–06/2016*
Taught classes for Linear Algebra (MATH1002), Discrete Mathematics (MATH1004), and Differential Calculus (MATH1001/1901), including the grading of tests and assignments

○ **University of Sydney** − *Summer researcher*   *12/2014–02/2015*
Worked with A/Prof. Yacobi and peers on a research project in categorical representation theory; results now published

Selected awards

- **RTP stipend and Merit Award** — **University of Sydney** — *2018*
  PhD funding with supplementary scholarship

- **Moussouris Award** — **University of Oxford** — *2016*
  Full scholarship from the Mathematics Institute

- **Joye Prize** — **University of Sydney** — *2016*
  Joint first place in 2015 Mathematics Honours program

- **George Allen Scholarship for Pure Mathematics** — **University of Sydney** — *2015*
  On the basis of performance in senior pure mathematics

- **Academic Merit Prize** — **University of Sydney** — *2014–2016*
  For high performance in undergraduate courses

- **Dean's Honours List Prize (Second Year)** — **University of Sydney** — *2014*
  Top Weighted Average Mark (WAM) in Faculty of Science cohort

- **John Spark Memorial Prize** — **University of Sydney** — *2013*
  First place in intermediate mathematics

Publications

1. Ciappara, J. "Singular Hecke category actions." In preparation.
2. Ciappara, J. "Actions of the Hecke category via Smith–Treumann theory." Submitted. Preprint available at `https://arxiv.org/abs/2103.07091v2`.
3. Ciappara, J. and Williamson, G. "Lectures on the geometry and modular representation theory of algebraic groups". *Journal of the Australian Mathematical Society* 110, 1–47 (2021).
4. Arunasalam, S. and Ciappara, J. and Nguyen, D.M.H., et al. "A note on categorification and spherical harmonics". *Algebras and Representation Theory* 23, 1285–1295 (2020).

Extracurricular activities and service

- **Journal referee**, *2020–present*: Reviews for *IMRN* and *Compositio Mathematica*
- **Convener of USYD Student Algebra Seminar**, *2020–present*: Organise weekly talks and plan themes of study for each semester
- **Participant and organiser for Oxford reading groups**, *2017–2018*: Gave talks in reading groups on p-adic Hodge theory, stack theory, and algebraic K-theory; organised the latter
- **Vice-President of Sydney University Mathematics Society (SUMS)**, *2015*: Was responsible for assisting the President in organising weekly events and planning the direction of the Society
- **Mentor for the Talented Students Program in USYD's Faculty of Science**, *2014*: Supervised a group of four first-year students investigating a special mathematical topic in group theory for a ten-week research project (with Prof. Stephan Tillmann)
- **Secretary of SUMS**, *2013–2014*: Kept minutes of Society meetings and arranged the AGM
- **Volunteer editor and administrator for Wikipedia, the free encyclopedia**, *2007–2012*: Made more than 40,000 edits to the encyclopedia and authored more than 120 original articles, some featured on the website's front page

Talks given

- *The Atiyah–Hirzebruch spectral sequence*
  Featuring a derivation, examples, and applications
  Informal Friday Seminar, Sydney
  10/2021

- *An introduction to model categories*
  Via the survey of Dwyer–Spalinski
  Informal Friday Seminar, Sydney
  09/2021

- *Hecke category actions via Smith–Treumann theory*
  An overview of my PhD thesis and results
  Rep. Theory Oberseminar, Bonn
  07/2021

- *A problem for the topologists or geometers*
  An exposition of a classical paper of Soergel
  Informal Friday Seminar, Sydney
  07/2020

- *Wall-crossing actions of Soergel bimodules*
  A virtual talk explaining my PhD research
  Junior Algebra Seminar, Oxford
  06/2020

- *Projective functors*
  A two-part talk expositing work of Bernstein and Gelfand
  Informal Friday Seminar, Sydney
  05/2019

- *Perverse sheaves and the weak Lefshetz theorem*
  In preparation for a MATRIX workshop the next month
  Informal Friday Seminar, Sydney
  11/2018

- *A characteristic variety for $\widehat{D}$*
  An introduction to my research at Oxford
  Seminar, Oxford
  05/2018

- *Categorical rigidity*
  An exploration of $\mathrm{Aut}(C)$ for various categories C
  Junior Algebra Seminar, Oxford
  11/2017

- *The Collatz conjecture*
  A brief description of the problem and what we know so far about its solution
  SUMS
  08/2015

- *Spherical harmonics and categorical representation theory*
  An overview, given at Melbourne University, of my AMSI Vacation Research
  AMSI VR talks
  01/2015

Workshops and conferences attended

- Representation Theory's Hidden Motives (virtually in **Münster**, *09/2021*)
- The 6th KTGU Mathematics Workshop for Young Researchers (virtually in **Kyoto**, *02/2021*)
- New Connections in Representation Theory (**Mooloolaba**, *02/2020*)
- Geometry and Modular Representation Theory of Algebraic Groups (**New York**, *08/2019*)
- Geometric and Categorical Representation Theory (**Creswick**, *12/2018*)
- Summer School in Geometric Representation Theory (**Vienna**, *07/2018*)
- D-modules, Geometric Representation Theory, and Arithmetic Applications (**Oxford**, *12/2017*)
- Postgraduate Group Theory Conference (**Cambridge**, *06/2017*)
- p-adic Analytic Geometry and Differential Equations (**Marseille**, *03/2017*)
- Geometry at the ANU (**Canberra**, *08/2016*)
- AMSI Winter School in Algebra, Geometry and Physics (**Brisbane**, *07/2015*)