Jack Shotton

Curriculum Vitae

Department of Mathematical Sciences
Durham University
Durham
DH1 3LE
✉ *jack.g.shotton@durham.ac.uk*
Webpage

Education

2020–2021 **Durham University**, PGCLTHE.
Postgraduate certificate in learning and teaching in higher education.

2011–2015 **Imperial College London**, PhD.
The Breuil–Mézard conjecture when $l \neq p$. Supervisor: Professor Toby Gee.

2010–2011 **University of Cambridge**, MMath (Part III).
Distinction.

2007–2010 **University of Cambridge**, BA (Mathematics).
Fifth in year.

Employment

2018 – **Durham University**, Assistant Professor.
Permanent teaching and research position.

2019 **Max Planck Institute for Mathematics**, research visitor.
Three-month visit replacing declined postdoctoral position.

2015 – 2018 **University of Chicago**, L. E. Dickson Instructor.
Postdoctoral position mentored by Professor Matthew Emerton, with substantial teaching component.

Summer 2011 **Softwire**, intern software developer.

Summer 2010 **Civil service**, intern mathematician.

Summer 2009 **University of Cambridge**, undergraduate research student.

Preprints and publications

2023 Irreducible components of the moduli space of Galois representations. *Submitted preprint.*

2023 Endomorphism rings of Gelfand–Graev representations II, *with Tzu-Jan Li*. **Bull. LMS.**

2022 Generic local deformation rings when $l \neq p$. **Compositio Math.**

2021 Ihara's Lemma for Shimura curves via patching, *with Jeffrey Manning*. **Math. Annalen.**

2020 On the category of finitely presented smooth mod p representations of $GL_2(F)$, $F/\mathbb{Q}_p$ finite. **Documenta Math.**

2019 Local deformation rings for 2-adic representations of $G_{\mathbb{Q}_l}$, $l = 2$.
Appendix to On crystabelline deformation rings of $\mathrm{Gal}(\overline{\mathbb{Q}}_p/\mathbb{Q}_p)$ *by Yongquan Hu and Vytautas Paškūnas.* **Math. Annalen.**

2018 The Breuil–Mézard conjecture when $l \neq p$. **Duke Math. Journal.**

2016 Local deformation rings and a Breuil–Mézard conjecture when $l \neq p$. **Algebra & Number Theory.**

Research students

2019 – 2023 Daniel Funck, PhD student.
The geometry of unipotent deformations and applications (GOUDA).

2023 Alex Milner, LMS summer research student.
Invariant factors of elliptic curves.

2022 Patrick Creagh, summer research student.
Steinitz classes of CM elliptic curves.

2019 Dylan Johnston, LMS summer research student.
Positivity and the weight part of Serre's conjecture.

2018 David Lin, summer research student.
The Kronecker–Weber theorem.

Awards and funding

2023 LMS Undergraduate Research Bursary.
To supervise Alex Milner.

2021 Fellow of the HEA.

2019 LMS Undergraduate Research Bursary.
To supervise Dylan Johnston.

2015 TCC event day.
Funding to organise one-day graduate workshop in number theory.

2014 Cecil King Travel Scholarship.
To visit Matthew Emerton at University of Chicago.

2005–2007 International Mathematical Olympiad.
Bronze medal (2005), silver medal (2006), gold medal (2007).

Teaching

Durham University

2024 Lecturer for MAGIC modular forms course.

2023 – Module leader for Cryptography III and Number Theory III.

2019 – 2022 Module leader for Representation Theory IV.

2018 – 2019 Module leader for Cryptography III.

2018 – Tutor for Analysis I, Algebra II and Programming I.

2018 – Marker (various modules).

2018 – Supervisor for final-year projects (approx. 15 students total).

University of Chicago

2015 – 2018 Instructor for Introduction to Proof in Analysis and Linear Algebra, Honors Basic Algebra, and Honors Calculus.

Other

2012 – 2015 Graduate teaching assistant at Imperial College London.

2012 – 2015 Private tutor.

2011 – 2012 Supervisor (tutor to pairs of undergraduates) at University of Cambridge.

Citizenship

2022 – SAC officer.
Assessed students' Severe Adverse Circumstances surrounding examinations.

2023 Algebra and Number Theory in Conversation (ANTIC), co-organiser.
Interdisciplinary workshop in Manchester on algebra and number theory.

2021 – Departmental mentor.
Mentor to Sacha Mangerel.

2020 – 2021 EPSRC, *reviewer*.
New Horizons and Postdoctoral Fellowship programs.

2019 – Open day team, member.

2019 – 2022 Durham number theory seminar, organiser.

2019 – 2022 Durham pure mathematics colloquium, organiser.

2019 Durham workshop, "Next steps in academia", speaker.

2016 – 2018 Chicago number theory seminar, co-organiser.

2015 – Various journals, referee.
Including ASENS, Forum Math. Sigma, ANT, IMRN, Trans. AMS.

2016 – Mathscinet, reviewer.
Fifteen reviews.

2015 TCC event day, organiser.
One-day graduate workshop in number theory.

Outreach

2007 – **United Kingdom Mathematics Trust**, volunteer.
Led sessions at and helped organise various training camps. Mentored school students by correspondence. Set and marked national maths competitions.
From 2010–2012, was Deputy Leader of UK team at International Mathematical Olympiad.

2018 **University of Chicago Young Scholars Program**, instructor.
Taught a short course on error-correcting codes to high school students.

2008 **University of Cambridge**, STEP student mentor.
Taught a class of around 10 high-school students in a week long course providing STEP tuition to students whose schools were unable to do so.

Invited talks

2023 Cambridge number theory seminar
Manchester algebra seminar
Glasgow algebra and number theory seminar

2022 Sheffield number theory day

2021 Durham, workshop on representations of p-adic groups

2020 Chalmers number theory seminar
Paris XIII, workshop on the p-adic Langlands program

2019 Warwick number theory seminar

2018 Sheffield number theory seminar
London number theory seminar
Durham number theory seminar
Heidelberg, workshop on Galois representations
Stanford number theory seminar

Chicago number theory seminar

2017 UIC number theory seminar

2016 UIUC number theory seminar

Northwestern University number theory seminar

Chicago number theory seminar

2015 Midwest Number Theory Conference for Graduate Students and Recent PhDs

British Mathematical Colloquium, number theory workshop (prize for best student talk)

London number theory seminar

Heidelberg, workshop on Galois representations