

Hong Yi Huang

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School of Mathematics and Statistics, University of St Andrews, St Andrews KY16 9SS, UK

Research interests

- Group theory (permutation groups, simple groups, algebraic groups)
- Algebraic combinatorics
- Representation theory

Employment

LMS Early Career Research Fellow, University of St Andrews, United Kingdom

Apr – Sept 2025

- Host: Professor Colva Roney-Dougal
- Financial support: London Mathematical Society & Heilbronn Institute for Mathematical Research

Education

University of Bristol (UoB), United Kingdom

Jan 2021 – Mar 2025

- PhD in Mathematics
- Supervisor: Professor Tim Burness
- Funding: China Scholarship Council
- Thesis: *Bases for permutation groups and related problems*

Southern University of Science and Technology (SUSTech), China

Sept 2016 – July 2020

- Bachelor of Science
- Major in Mathematics and Applied Mathematics
- Supervisor: Professor Cai Heng Li
- Thesis: *On valency problems of $Saxl$ graphs of almost simple primitive groups with soluble stabiliser*

Distinctions

Oberwolfach Leibniz Graduate Students grant, Mathematical Research Institute Oberwolfach	2025
Alumni Grant: Conference Travel Fund (£300), UoB	2024
China Scholarship Council (full PhD scholarship at UoB)	2021–25
Outstanding undergraduate thesis, SUSTech	2020
First-class scholarship, SUSTech	2017–18
First prize, Chinese Mathematics Competition (Guangdong)	2017

Last updated: 16 April 2025

Journal publications and preprints

- [7] S.D. Freedman, H.Y. Huang, M. Lee and K. Rekvényi, *On the generalised Saxl graphs of permutation groups*, submitted (2024), 35 pp. arxiv:2410.22613
- [6] H.Y. Huang, C.H. Li and Y.L. Xie, *Fixers and derangements of finite permutation groups*, **J. Algebraic Combin.**, to appear. arXiv:2404.18753
- [5] H.Y. Huang, C.H. Li and Y.Z. Zhu, *On finite permutation groups of rank three*, **J. Algebra** 666 (2025), 703–732. doi:10.1016/j.jalgebra.2024.11.028
- [4] H.Y. Huang, *Base sizes of primitive groups of diagonal type*, **Forum Math. Sigma** 12 (2024), Paper No. e2, 43 pp. doi:10.1017/fms.2023.121
- [3] T.C. Burness and H.Y. Huang, *On base sizes for primitive groups of product type*, **J. Pure Appl. Algebra** 227 (2023), Paper No. 107228, 43 pp. doi:10.1016/j.jpaa.2022.107228
- [2] T.C. Burness and H.Y. Huang, *On the Saxl graphs of primitive groups with soluble stabilisers*, **Algebr. Comb.** 5 (2022), 1053–1087. doi:10.5802/alco.238
- [1] J. Chen and H.Y. Huang, *On valency problems of Saxl graphs*, **J. Group Theory** 25 (2022), 543–577. doi:10.1515/jgth-2021-0123

Work in progress

- *On chiral generating pairs of finite simple groups.*
- *The base sizes of almost simple classical groups on subspaces*, with T. Feng.
- *A Boolean homological structure of symmetries in finite sets*, with Z. Huang and Y.Z. Zhu.
- *On transitive subgroups of primitive groups*, with L. Wang.
- *Tetravalent graphical regular representations of finite simple groups*, with B. Xia and J. Zhang.
- *Base extensions of permutation groups*, with Y.Z. Zhu.

Conference & seminar organisation

26th Postgraduate Group Theory Conference (PGTC), UoB

July 2025

- With Marina Anagnostopoulou-Merkouri, Pénélope Azuelos, David Guo, Merlin Haith Rowlett and Sarah Martin
- Funded by the London Mathematical Society, the Heilbronn Institute for Mathematical Research and the School of Mathematics of UoB
- Website: <https://sites.google.com/view/pgtc2025>

Bristol Junior Algebra and Combinatorics Seminar (BJACS), UoB

Feb–May 2024

- Founding co-organiser
- With Marina Anagnostopoulou-Merkouri and Merlin Haith Rowlett
- Website: <https://sites.google.com/view/bjacs>

4th International Conference on Groups, Graphs and Combinatorics, SUSTech

Nov 2023

- With a group of people led by Cai Heng Li

Seminars on Groups and Graphs, SUSTech (online)

2021–24

- Founding co-organiser
- With Zhaochen Ding (2021–24), Yilin Xie (2021–23), Junyan Chen (2024) and Fu-Gang Yin (2024)
- Website: <https://www.gtseminar.xyz/>

Conference invitations

Finite Groups, Fusion Systems and Applications, Mathematical Research Institute Oberwolfach

Mar 2025

Invited talks & seminars

2025

Permutation groups, transitive subgroups and bases, Pure Maths Colloquium, University of St Andrews 17 Apr

Permutation groups, symmetry breaking and probability, Great Bay University 26 Feb

Permutation groups, symmetry breaking and probability, Guangxi University 25 Feb

2024

Permutation groups, symmetry breaking and probability, Zhejiang University 24 Dec

Bases and Saxl graphs in the past four years, Discrete Mathematics Seminar, SUSTech 12 Dec

Bases and Saxl graphs for permutation groups, BJACS, UoB 18 Sept

Bases for permutation groups, University of Milano-Bicocca, Italy 6 Sept

Permutations, bases and low rank groups, Joint Algebra Seminar, RWTH Aachen 13 June

Permutations, bases and low rank groups, Advanced Seminar on Group Theory, HHU Düsseldorf 11 June

Permutations, bases and low rank groups, Seminar Groups and Representations, Kaiserslautern-Landau 6 June

Permutations, bases and low rank groups, Algebra Seminar, UoB 19 Mar

Bases for permutation groups, Algebra Seminar, University of Warwick 29 Jan

2023

Bases for permutation groups, Algebra Seminar, University of Birmingham 30 Nov

Symmetry breaking on graphs and groups, Seminars on Discrete Mathematics, Xiamen University 26 Sept

Permutation groups: bases and Saxl graphs, Capital Normal University 16 Sept

Bases for permutation groups, SUSTech 7 Sept

Bases for permutation groups, Junior London Algebra Colloquium, Imperial College London 23 Mar

2022

Bases, distinguishing partitions and probabilistic methods, The University of Melbourne 18 Aug

2021

Groups, graphs and transitivity, Junior Algebra Colloquium, UoB 21 May

The probabilistic method in group theory, Discrete Mathematics Seminar, SUSTech 22 Apr

2020

On valency problems of Saxl graphs, Discrete Mathematics Seminar, SUSTech 26 Nov

Other talks

2025

Transitive subgroups of primitive groups, Mathematical Research Institute Oberwolfach, Germany 20 Mar

Regular subgroups of primitive groups, Groups, Graphs and Combinatorics, Kunming 12 Jan

2024

- The generalised Saxl graphs of finite permutation groups*, Topics in Group Theory, Padova, Italy 11 Sept
Permutation groups of rank three, Group Theory in Florence IV, Florence, Italy 2 July

2023

- Bases for permutation groups*, 16th National Conference on Algebra, Quanzhou 18 Nov
Bases for permutation groups, 4th International Conference on Groups, Graphs and Combinatorics 11 Nov
Symmetry breaking on primitive groups, Seminars on Groups and Graphs, SUSTech 4 Mar

2022

- Base-two primitive permutation groups*, Young Group Theorists Workshop, SwissMAP, Les Diablerets 5 Sept
Base-two primitive permutation groups, Groups St Andrews, Newcastle, UK 4 Aug
Base-two primitive permutation groups and their Saxl graphs, Groups and Graphs 24 July
Base-two primitive permutation groups, 23rd Postgraduate Group Theory Conference 8 July
Bases for primitive permutation groups, Group Theory Seminar, SUSTech 24 May
Regular orbits of primitive groups on power sets, Group Theory Seminar, SUSTech 19 Feb

2021

- Base-two primitive permutation groups and their Saxl graphs*, 43rd Australasian Combinatorics Conference 13 Dec
Regular suborbits of finite primitive groups, Groups, Graphs and Combinatorics 14 Nov
Base-two primitive permutation groups and their Saxl graphs, LMS Graduate Student Meeting 8 Nov
The distinguishing number of permutation groups, Group Theory Seminar, SUSTech 9 Oct
On valency problems of Saxl graphs, Workshop on Group Actions and Transitive Graphs 2 Jan

2020

- On valency problems of Saxl graphs*, SUSTech 17 Nov

Other conferences

2025

- Groups, Graphs and Combinatorics*, Yunnan University, Kunming, China Jan

2024

- Topics in Group Theory*, University of Padova Sept
Group Theory in Florence IV, University of Florence July
New perspectives in Computational Group Theory, University of Warwick June

2023

- 16th National Conference on Algebra*, Quanzhou, China Nov
International Conference on Combinatorics and Finite Geometry, SUSTech Sept
CMI-HIMR Summer School: Probabilistic Group Theory, UoB June
Fry Conference Series: New Perspectives in Pure Mathematics, UoB Mar

2022

- Young Group Theorists Workshop*, SwissMAP, Les Diablerets, Switzerland Sept
Groups St Andrews, Newcastle University Aug
Simple groups, Representations and Applications, Isaac Newton Institute, University of Cambridge July
Groups and Graphs, Jiangxi University of Science and Technology (online) July
23rd Postgraduate Group Theory Conference, London July

2021

<i>43rd Australasian Combinatorics Conference, The University of Melbourne (online)</i>	<i>Dec</i>
<i>Groups, Graphs and Combinatorics, SUSTech (online)</i>	<i>Nov</i>
<i>LMS Graduate Student Meeting, London Mathematical Society (online)</i>	<i>Nov</i>
<i>Workshop on Group Actions and Transitive Graphs, Kunming, China</i>	<i>Jan</i>

Before 2020

<i>Workshop on Combinatorics and Graph Theory, SUSTech</i>	<i>Oct 2020</i>
<i>International Conference on Algebraic Combinatorics, Jiaozuo, China</i>	<i>Sept 2019</i>
<i>The Third International Conference on Group Actions and Transitive Graphs, SUSTech</i>	<i>Oct 2018</i>

Teaching

Tutorial leader, School of Mathematics, UoB

- 2023–2024 Teaching Block 2: MATH10010 Introduction to Group Theory (3 tutorial groups)
- 2021–2022 Teaching Block 1: MATH10010 Introduction to Proofs (3 tutorial groups)

Teaching assistant, Department of Mathematics, SUSTech

- 2019–2020 Spring: MA109 Advanced Linear Algebra (1 out of 3 tutorial groups)
- 2019–2020 Fall: MA107 Advanced Linear Algebra I (2 out of 2 tutorial groups)
- 2018–2019 Spring: MA104b Linear Algebra II (1 out of 4 tutorial groups)

Homework marker, Department of Mathematics, SUSTech

- 2020–2021 Spring: MA321 Group Representation Theory, and MA219-16 Elementary Number Theory
- 2019–2020 Fall: MA321 Group Representation Theory, and MA219 Abstract Algebra (H)
- 2018–2019 Spring: MAT8010 Combinatorics (PG)
- 2017–2018 Fall: MA219-16 Elementary Number Theory, and MA213-16 Mathematical Analysis

Research visits

2025: Great Bay University (1 day, hosted by Weicong Li); Guangxi University (1 day, Huye Chen); Yunnan University (1 week, hosted by Lei Wang)

2024: Zhejiang University (1 week, Tao Feng); SUSTech (1 week, Cai Heng Li); Milano-Bicocca (3 days, Pablo Spiga); Warwick (1 day, Gareth Tracey); RWTH Aachen (3 days, Alice Niemeyer); HHU Düsseldorf (2 days, Benjamin Klopsch); Kaiserslautern-Landau (1 week, Gunter Malle); Imperial College London (3 days, Kamilla Rekvényi)

2023: Xiamen University (1 week, Jiyong Chen); Capital Normal University (1 week, Shaofei Du); SUSTech (1 month, Cai Heng Li)

2021: SUSTech (2 months, Qing Xiang)

2020: SUSTech (6 months, Cai Heng Li)

Professional activities

- Refereeing assignments: Journal of Algebra, European Journal of Combinatorics
- Reviewer for AMS Mathematical Reviews *since 2023*
- Associate member of the London Mathematical Society *since 2024*
- Member of the Combinatorial Mathematics Society of Australasia *2022*