Emile Takahiro Okada

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Academic Positions

2022-Current: Peng Tsu Ann Assistant Professor, National University of Singapore

Education

2018-2022: DPhil in Mathematics, University of Oxford
Thesis: The wavefront set of representations of p-adic groups
Supervisors: Prof. Dan Ciubotaru, Prof. Kevin McGerty

2017-2018: Master of Mathematics, University of Cambridge
Thesis: Modular Representations of Finite Groups of Lie Type in the Defining Characteristic.
Grade: Distinction.

2014-2017: Bachelor of Arts in Mathematics, University of Cambridge
Grade: First Class in all years.

Skills

Computer Languages
Python, Matlab, C++, Mathematica, GAP, LaTeX, HTML, JavaScript, CSS.

Languages
Fluent in English and Norwegian. Conversant in Japanese.

Publications

8. **The stable wave front set of the theta representation**
with E. Karasiewicz, R. Wang
submitted.

7. **Ramification of weak Arthur packets for p-adic groups**
with M. Gurevich,
submitted.

6. **Local character expansions and asymptotic cones over finite fields**
with D. Ciubotaru,
Proceedings of the London Mathematical Society (accepted).

5. **Wavefront Sets of Unipotent Representations of Reductive p-adic Groups II**
with D. Ciubotaru, L. Mason-Brown,
Journal für die reine und angewandte Mathematik (accepted)

4. **Some Unipotent Arthur Packets for Reductive p-adic Groups**
with D. Ciubotaru, L. Mason-Brown,
International Mathematics Research Notices, Volume 2024, Issue 9, May 2024, Pages 7502–7525

3. **The Wavefront Sets of Unipotent Supercuspidal Representations**,

with D. Ciubotaru, L. Mason-Brown,
Algebra & Number Theory, Vol. 18 (2024), No. 10, 1863–1889

2. **Wavefront Sets of Unipotent Representations of Reductive p-adic Groups I** ,
with D. Ciubotaru, L. Mason-Brown,
American Journal of Mathematics (accepted)

1. **The wavefront set of representations of p-adic groups**,
PhD thesis

Invited Talks

On Lusztig's local Langlands correspondence and functoriality, Xiamen University, China. *01/2025*

An introduction to the representation theory of p-adic groups, Xiamen University, China. *01/2025*

On Singularities and Ramification of Arthur Packets, Beijing International Center for Mathematical Research, Peking University, China. *12/2024*

Involutivity in the unramified local Langlands correspondence, Yau Mathematical Sciences Center at Beijing, Tsinghua University, China. *12/2024*

On the Adams–Vogan conjecture, NCTS Workshop on Representation Theory and Lie Groups, National Center for Theoretical Sciences, Taiwan. *12/2024*

Types, Hecke algebras, and wave front sets, Representations of p-adic groups, Mathematisches Forschungsinstitut Oberwolfach, Germany. *12/2024*

Lecture series on the wave front set (4 lectures), National University of Singapore, Singapore. *11/2024*

Character sheaves, Hecke algebras, and the wavefront set, Representation theory seminar, University of Melbourne, Australia. *08/2024*

Ramification of weak Arthur packets, Pan Asian Number Theory Conference, Vietnam Institute of Advanced Study in Mathematics, Vietnam. *07/2024*

Ramification of weak Arthur packets, Algebra seminar, University of Aarhus, Denmark. *07/2024*

Ramification of weak Arthur packets, Pacific Rim Conference in Mathematics, Darwin, Australia. *06/2024*

The wavefront set of a p-adic representation, Lie Theory seminar, Chinese University of Hong Kong, Shenzhen, China. *04/2024*

Weakly spherical representations and the weak Arthur packet conjecture, Arthur Packets, Institute for Advanced Study in Mathematics, Hangzhou, China. *11/2023*

On some recent progress on wavefront sets in depth-0 and positive depth, Anaparastaseis: Orbits, Hecke algebras, and representations, Nisyros. *07/2023*

The wavefront set of unipotent representations with real infinitesimal character, Algebra Seminar, Oxford University. *06/2023*

The wavefront set of unipotent representations with real infinitesimal character, Algebra University, Haifa University. *05/2023*

Wavefront sets of representations of p-adic groups, Mini-workshop on p-adic group representations, Fudan University. *12/2022*

New results and open questions from the study of local wavefront sets, Representation Theory and Number Theory Seminar, National University of Singapore. *09/2022*

On the construction of some unipotent local Arthur packets, Minimal Representations and Theta Correspondence, Erwin Schrödinger International Institute for Mathematics and Physics. *02/2022*

The wavefront set and Arthur packets of p-adic groups, Lie Groups Seminar, MIT. *02/2022*

Arthur packets for p-adic groups and the wavefront set, Number Theory Seminar, University of Cambridge. *02/2022*

The wavefront set of representations of p-adic groups, Algebraic Geometry and Representation Theory Seminar, Weizmann Institute. *01/2022*

The Wavefront Set of Spherical Arthur Representations, Representation Theory Seminar, Purdue University. *10/2021*

The wavefront set of admissible representations of p-adic groups, Representations of p-adic groups and related topics, Durham University. *09/2021*

The Wavefront Set of Spherical Arthur Representations, Representation Theory and Number Theory Seminar, National University of Singapore. *09/2021*

Parameterising unramified nilpotent orbits using dual Springer parameters, Algebra Seminar, University of Oxford. *10/2020*

A parameterisation of nilpotent orbits over a maximal unramified extension of a p-adic field using dual Springer parameters, Junior London Algebra Colloquium, Imperial College London. *07/2020*

Conferences

Representations of p-adic groups *December 2024*
Mathematisches Forschungsinstitut Oberwolfach, Germany. 1 week.

Representation Theory and Lie Groups *October 2024*
Brin Mathematics Research Center, United States of America. 1 week.

Pan Asian Number Theory Conference *July 2024*
Vietnam Institute of Advanced Study in Mathematics, Vietnam. 1 week.

Pacific Rim Conference in Mathematics *June 2024*
Australian National University, Australia. 1 week.

Arthur Packets *November 2023*
Institute for Advanced Study in Mathematics, Hangzhou, China. 1 week.

Anaparastaseis: Orbits, Hecke algebras, and representations *July 2023*
Nisyros, Greece. 1 week.

Representation Theory, Combinatorics and Geometry *December 2022*
National University of Singapore, Singapore. 4 weeks.

Minimal Representations and Theta Correspondence *April 2022*
Erwin Schrödinger International Institute for Mathematics and Physics, Austria. 1 weeks.

Representations of p-adic groups and related topics *September 2021*

Durham University, Durham, UK. 1 day.
Buildings and Affine Grassmannians *August 2019*
Centre International de Rencontres Mathématiques, Marseille, France. 2 weeks.

Teaching

Lecturer - National University of Singapore
MA5211 Lie Theory, MA3201 Algebra II.

Tutor - Somerville College, University of Oxford
Prelims Analysis II, Prelims Analysis III, Part A Integration, Part A Topology, and Part A Groups.

Teaching Assistant - Mathematical Institute, University of Oxford
B2.1 Introduction to Representation Theory (x2), B2.2 Commutative Algebra (x1), B3.1 Galois Theory (x4), C2.2 Homological Algebra (x1), C2.7 Category Theory (x1).

Master's students
Timothy Peck Hsien Wei *2023 - 2024*

Undergraduate research project
Galileo Grey *2024 - current*

Service

Journal Referee
Selecta Mathematica, Advances in Mathematics, Algebra and Number Theory, International Mathematics Research Notices.

Seminar Organiser
Algebraic groups *2019*
The local Langlands correspondence for unipotent representations *2022*
p-adic Arthur packets *2024*

Awards and Honors

Aker Scholarship *2018 - 2022*
Cambridge University Trust Scholarship *2014 - 2018*
Emmanuel College Examination Prizes *2015,2016,2017,2018*

Employment

University of Oxford
Stipendiary Lecturer at Somerville College *January 2021-September 2021*

Den Norske Bank (DNB Bank ASA)
Foreign Exchange Desk Intern *July - August 2018*
Digitalization, Business Development and Innovation Intern *June - September 2017*
Awards: 1st place in hackathon.

Summer Research in Mathematics

Cambridge Image Analysis Group, University of Cambridge *June - August 2016*

Other

Part-Time Developer, Agora *November 2014 - January 2016*

Part-Time Research Assistant, Kyoto University *December 2014 - October 2015*

Supervisor: Dr. Nike Dattani.

References

Dan Ciubotaru, University of Oxford, *dan.ciubotaru@maths.ox.ac.uk*

Wee Teck Gan, National University of Singapore, *matgwt@nus.edu.sg*

Maxim Gurevich, Technion - Israel Institute of Technology, *maxg@technion.ac.il*

Lucas Mason-Brown, The University of Texas at Austin, *lucas.masonbrown@gmail.com*