Arun Soor

Mathematical Institute, University of Oxford
Radcliffe Observatory, Andrew Wiles Building
Woodstock Road, Oxford OX2 6GG

arun.soor@maths.ox.ac.uk
www.maths.ox.ac.uk/people/arun.soor
a-soor.github.io

Academic Interests

I am a second-year DPhil (Mathematics) student at the Univeristy of Oxford under Prof. Konstantin Ardakov. My research interests include: locally analytic representations of p-adic Lie groups, $\widehat{\mathcal{D}}$-modules on rigid analytic varieties, geometric representation theory, completed cohomology of locally symmetric spaces, and nonarchimedean functional analysis. I am currently working on a Beilinson-Bernstein localisation theory for locally analytic representations, which is "dual" to the localisation of Ardakov-Wadsley.

Education

University of Oxford, (Magdalen College).

- DPhil, Mathematics (expected graduation: July 2025).

- Advisor: Prof. Konstantin Ardakov.

University of Oxford, (St. John's College).

- MMath, Mathematics, *Distinction* (2021).

- Part C essay: *Crystal Graphs and the representation theory of the symmetric group.*

- BA, Mathematics, *First Class* (2020).

Publications and Preprints

5. **Origami and the structure of materials.** (joint with H. Liu, P. Plucinsky, F. Feng, and R. D. James). SIAM news January/February 2022.

4. **Convergence and an explicit formula for the joint moments of the circular Jacobi β-ensemble characteristic polynomial.** (joint with T.A. Assiotis and M. A. Gunes). Mathematical Physics Analysis and Geometry, 2022.

3. **On a distinguished family of random variables and Painlevé equations.** (joint with T.A. Assiotis, B. Bedert, and M.A. Gunes). Probability and Mathematical Physics, 2:613–642, 2021.

2. **Moments of generalized Cauchy random matrices and continuous-Hahn polynomials.** (joint with T.A. Assiotis, B. Bedert, and M.A. Gunes). Nonlinearity, 34(7):4923–4943, 2021.

1. **Origami-inspired thin-film shape memory alloy devices.** (joint with P. Velvaluri, P. Plucinsky, R. Lima de Miranda, R. D. James, and E. Quandt). Scientific Reports, 11(1):10988, 2021.

Contributed Talks

1. *Origami with conformal and helical symmetry.* Online, SIAM MS21 conference, 2021.

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[1] Updated June 27, 2023

Teaching Experience

University of Oxford

Since Michaelmas 2022, I am a Lecturer II in Mathematics at Magdalen College, Oxford.

- **Trinity 2023:** College tutorials (Magdalen) for ASO Group Theory, ASO Multidimensional Analysis & Geometry, M4 Constructive mathematics, various revision classes.
- **Hilary 2023:** College tutorials (Magdalen) for A5 Topology, M4 Dynamics; Tutor for C2.6 Introduction to Schemes.
- **Michaelmas 2022:** College tutorials (Magdalen) for A2 Metric Spaces & Complex Analysis; TA for B3.1 Galois theory, TA for C3.6 Modular Forms.
- **Trinity 2022:** College tutorials (Magdalen) for ASO number theory, revision classes for A2 Metric Spaces & Complex Analysis.
- **Hilary 2022:** TA for B3.4 Algebraic Number Theory.
- **Michaelmas 2021:** TA for B2.1 Introduction to Representation Theory.

Seminars

A list of all the study group talks I have given (with some notes) are available on my website.

Study groups organised

- Co-organiser of *Categorical Geometric Langlands* study group, with Ken Lee (Trinity 2023). Study group website.
- Together with James Taylor and Finn Wiersig, I organised an informal study group on *Topics in p-adic geometry.* We covered Rapoport-Zink spaces (Hilary 2023) and the schematic Fargues-Fontaine curve (Michaelmas 2022).
- I gave a series of talks on *Locally analytic vectors of completed cohomology* following Lue Pan's paper (Trinity 2022).

Experience

- President, the Oxford Invariants (2020-2021). The Invariants is Oxford's student mathematical society, founded in 1936.
- Undergraduate admissions interviews for Mathematics at Magdalen College, Oxford (December 2022).

Conferences attended

- Number theory meets *p*-adic representations, 13-17 February 2023, Münster, Germany.
- London-Paris Number Theory Seminar, *"Higher Coleman theory"*, 28-29 November 2022, Institut de Mathématiques de Jussieu, Paris, France.
- Topology and Arithmetic around the Langlands Programme, 7-11 June 2022, Stockholm University, Stockholm, Sweden.
- Arizona Winter School 2022, *"Automorphic forms beyond* GL_2*"*, 5-9 March 2022, University of Arizona, Tucson, Arizona.

Referees

Available upon request.