

# Mark Alvares Peres

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## Research interests

I am a DPhil Mathematics student at the University of Oxford, supervised by Prof. Kaibo Hu. I am interested in designing and analysing finite element simulations of fluid dynamics models, and in particular studying the effect of enforcing discrete conservation laws on the stability and accuracy of approximations. I am also eager to learn more about applying topological and geometric tools to the analysis of fluid dynamics models.

## Education

- 2025– **DPhil in Mathematics**, University of Oxford  
**Topic:** Structure-preserving finite element methods  
**Supervisor:** Prof. Kaibo Hu
- 2024–2025 **MSc in Computational Applied Mathematics**, University of Edinburgh  
**Thesis title:** Finite Element Methods and Structure Preservation  
**Supervisor:** Dr. Kaibo Hu  
**Grade:** Distinction
- 2019–2023 **BSc in Mathematics**, University of Glasgow  
**Thesis title:** An Introduction to Constructing 3-Manifolds  
**Supervisor:** Dr. Andy Wand  
**Grade:** 1st Class  
**Awards:** Matthew Muir Prize (2021), Dougall Prize (2022)

## Teaching Experience

- 2025 **Teaching Assistant**, *B6.3 Integer Programming*, Mathematical Institute, University of Oxford
- 2025 **Demonstrator**, *Prelims Computational Mathematics*, Mathematical Institute, University of Oxford
- 2022–2023 **Demonstrator**, *Science Fundamentals 1X & 1Y*, School of Chemistry, University of Glasgow

## Work Experience

- 2023–2024 **Data Science Intern**, National Audit Office, London  
Completed several projects, which included reproducing complex government financial models in R to provide assurance on the valuation of over £26bn in assets, and designing and building internal tools for data analysis.

## Conference presentations and posters

- Nov 2025 *Structure-Preserving Finite Element Methods for Fluids* (poster), SIAM Postgraduate Conference 2025, Bristol, UK