

# Andres Klene Sanchez

## INFORMATION

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Email: andres.klene@outlook.com

Citizenship: British/German/Spanish.

Research interests: differential geometry, (higher) category theory, mathematical physics.

## EDUCATION

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### MMath Mathematics, University of Oxford

2020–2024

- Year 4: Distinction (79; placed 20th in the cohort).  
Years 1–3: Upper second class (top of classification).
- Part C Dissertation: *Geometric quantisation and Hamiltonian cobordism*.  
Supervised by Prof. Andrew Dancer. Topics: symplectic geometry, quantum mechanics.
- Part B Essay: *Pseudo-holomorphic lines in the complex projective plane*.  
Supervised by Dr. Guillem Cazassus. Topics: almost-complex geometry, elliptic theory.
- Non-compulsory lecture courses taken for examination, organised by year:
  - (4) Homological Algebra, Category Theory, Algebraic Topology, Differentiable Manifolds, Algebraic Geometry, Riemannian Geometry, Low-Dimensional Topology and Knot Theory.
  - (3) Commutative Algebra, Geometry of Surfaces, Algebraic Curves, Topology and Groups, Functional Analysis I, Functional Analysis II.
  - (2) Rings and Modules, Integration, Topology, Differential Equations II, Probability, Integral Transforms, Calculus of Variations, Mathematical Modelling in Biology, Multidimensional Analysis and Geometry.

### A-Levels, King's College London Mathematics School

2018–2020

- Grades: A\*A\*AaA\* in Mathematics, Further Mathematics, Physics, AS Computer Science, EPQ.
- Extended Project Qualification (EPQ) Dissertation: *The Three-Body Problem*.
- King's Certificate Dissertation: *Planetary Orbits*. Supervised by Prof. Alice Rogers.

### GCSEs, Bacon's College

2013–2018

- Grades:  $9^6 \cdot 8^3 \cdot 6 \cdot 5$ , and an A in Astronomy from the Royal Observatory of Greenwich.

## EXPERIENCE

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### Tutor, Bacon's College

Sep 2024–(present)

- Teacher at a state school in London, delivering the Pure curriculum for Mathematics and Further Mathematics A-Levels. Teaching reference: Ms Sara Burgess (sara.burgess@baconscollege.co.uk).

### EPSRC Vacation Intern, Mathematical Institute

Jun 2023–Aug 2023

- Summer research project at Oxford, supervised by Prof. Jason Lotay.
- Funded by the EPSRC. Grant title: *Computing Fukaya categories inductively with Fukaya–Seidel categories*.
- Topics: symplectic Lefschetz fibrations, toric geometry, homological mirror symmetry.
- Produced a poster for an EPSRC poster event: *Mirror symmetry for  $V_7$* .

### MPLS Summer Placement, Hertford College

Jul 2022–Sep 2022

- Summer research project at Oxford, supervised by Prof. Ben Hambly.
- Funded by Hertford College. Grant title: *Non-symmetric diffusion processes on fractals*.
- Topics: fractal geometry, combinatorics, stochastic analysis.

## AWARDS

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- Hertford College Subject Prize (for exceptional examination results in the final year) 2024
- Hertford College Finalist Prize (for first-class examination results in the final year) 2024
- Hertford College Scholarship (for first-class examination results) 2022

## WRITING

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- [4] [in progress] *Doodles of a Mouse*. Notes on (higher) topos theory, derived geometry and mathematical physics.
- [3] *Geometric quantisation and Hamiltonian cobordism*. Part C Dissertation.
- [2] *Pseudo-holomorphic lines in the complex projective plane*. Part B Essay.
- [1] *Associative Metrics*, *The Invariant*, 2023 (pp. 30–37). Article for the University of Oxford’s undergraduate mathematics magazine.

## CONFERENCES/WORKSHOPS ATTENDED

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- Mathematical Institute, Oxford, UK. *Gauge Theory and Topology*. Jul 2023  
Conference in celebration of Peter Kronheimer’s 60th birthday.
- CIRM, Marseille, France. *Morse and Floer Theories*. Feb 2023  
Workshop for early researchers on Floer homology and Fukaya categories.

## LANGUAGES

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- Spoken: English (native), Spanish (fluent, non-technical), German (conversational).
- Programming: Python, MATLAB, Mathematica.

## ACADEMIC REFERENCES

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- Prof. Jason Lotay (lotay@maths.ox.ac.uk)  
Position: Professor of Pure Mathematics, University of Oxford.
- Prof. Andrew Dancer (dancer@maths.ox.ac.uk)  
Position: Professor of Mathematics, University of Oxford.
- Dr. Guillem Gazassus (gazassus@imada.sdu.dk)  
Postdoctoral Researcher in Quantum Mathematics, University of Southern Denmark.