

# John, ZHAI Jun

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## Education

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**National University of Singapore** Aug 2024 – Present  
PhD in Mathematics. Current Interest: AI4Math, Automatic Theorem Proving with LLMs, agential systems and evolutionary algorithms.  
Advisor: Prof. Liu YANG, NUS.  
Co-advisor: Prof. Xinliang AN, NUS.

Courses Taken: Modeling and Numerical Simulations, Representation Theory, Commutative and Homological Algebra, Lie Theory, Logic and Foundation of Mathematics II, Graduate Algebra I, Graduate Algebra II, Complex Analysis.

**National University of Singapore** Aug 2020 – May 2024  
B.Sc. in Mathematics and Physics (Honours, Highest Distinction).  
Thesis: Large Cardinals  
Keywords: Mathematical logic, consistency hierarchy, Zermelo-Fraenkel set theory.  
Advisor: Prof. CHONG Chi Tat, NUS.

- Special Programme in Mathematics, a rigorous programme specially designed for a select group ( $\approx 10$ ) of students who have a strong passion and aptitude for the mathematical sciences, especially pure mathematics.
- Achievements include Tin Ka Ping Foundation Scholarship, Tham Kai Shui Excelsior Scholarship, Dean's Lists (Top 5% students), etc.

## Research Interests

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Scientific AI in solving PDEs/ODEs, In-Context Operator Learning, AlphaEvolve, AI theorem proving.

## Other Research Experience

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**Advanced Undergraduate Research Opportunity Programme, NUS** 2022  
Thesis: Gauss Sums  
Keywords: Number theory, Gauss sum, complex analysis, representation theory, weil representation.  
Advisor: Prof. LOKE Hung Yean, NUS.

**Young Science and Engineering Researchers Program, Tokyo Institute of Technology** 2023  
Project: Pseudospheres and Bäcklund transform  
Keywords: Differential geometry, breather surface, Bäcklund transform, soliton theory.  
Advisor: Prof. YAMADA Kotaro, Tokyo Tech.

## Teaching Experience

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**Undergraduate/ Graduate Teaching Assistant, NUS** 2023 – Present

- Assisted in undergraduate courses in calculus, linear algebra and quantitative finance.
- Graded assignments and exams.

## Skills

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- Programming: Python, Mathematica, MATLAB, Lean,  $\LaTeX$
- Languages: English (fluent), Chinese (native)