

Jonas Conneryd

Department of Computer Science
Lund University, Sweden

Date of birth: July 31st, 1997
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Education

Lund University

Ph.D. in Theoretical Computer Science
Advisor: Prof. Tatyana Turova

Lund, Sweden
2026 (expected)

Lic. Eng. in Computer Science

Thesis defended May 2025

Thesis: *On the Average-Case Proof Complexity of Graph Coloring*

Opponent: Prof. Nutan Limaye, ITU Copenhagen

KTH Royal Institute of Technology

Stockholm, Sweden

M.Sc. in Mathematics (joint with Stockholm University)

June 2021

Thesis: *Geometric Bounds for Steklov Eigenvalues on Graphs* (awarded Mittag-Leffler Prize)

B.Sc. in Engineering Physics

June 2019

Thesis: *Explicit Symplectic Integrators for Non-Separable Hamiltonians in Molecular Dynamics*

Research Interests

Computational complexity theory, particularly proof complexity with an algebraic flavor and the complexity of (random) constraint satisfaction problems.

Publications

- [1] Jonas Conneryd, Yassine Ghannane, and Shuo Pang. *Lower Bounds for CSP Hierarchies Through Ideal Reduction*. To appear in SODA 2026.
- [2] Jonas Conneryd, Kilian Risse, and Dmitry Sokolov. *Graph Coloring Is Hard on Average for Polynomial Calculus over Roots of Unity*. To be incorporated into a larger project also involving Yassine Ghannane, Jakob Nordström, and Shuo Pang. 2025.
- [3] Jonas Conneryd, Susanna F. de Rezende, Jakob Nordström, Shuo Pang, and Kilian Risse. *Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz*. FOCS 2023.
- [4] Jonas Conneryd. *Geometric Bounds for Steklov Eigenvalues on Graphs*. M.Sc. thesis. Stockholm University, 2021.

Talks

KTH Royal Institute of Technology

Stockholm, Sweden

Lower Bounds for CSP Hierarchies Through Ideal Reduction

Fall 2025

Oxford Proof Complexity Workshop

Oxford, United Kingdom

Lower Bounds for CSP Hierarchies Through Ideal Reduction

Summer 2025

Proof Complexity and Beyond, Oberwolfach Workshop 2413

Oberwolfach, Germany

Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz

Spring 2024

Algorithmic Research Cooperation around Øresund (ARCO)

Odense, Denmark

Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz

Fall 2023

IEEE Symposium on Foundations of Computer Science

Santa Cruz, CA, USA

Graph Colouring Is Hard on Average for Polynomial Calculus and Nullstellensatz

Fall 2023

Research Visits and Workshops

KTH Royal Institute of Technology

Stockholm, Sweden

Month-long visit to the theory group.

Fall 2025

University of Oxford

Oxford, United Kingdom

Visiting researcher for the workshop *Proof Complexity*.

Summers 2024, 2025

Centre International de Rencontres Mathématiques

Marseille, France

Visiting researcher for the *Complexity as a Kaleidoscope* research school.

Spring 2025

DIMACS, Rutgers University

New Brunswick, NJ, USA

Visiting researcher for the *Frontiers in Complexity Workshop*.

Summer 2024

McGill University

Montréal, Canada

Week-long visit to the group of Prof. Robert Robere.

Summer 2024

Mathematisches Forschungsinstitut Oberwolfach

Oberwolfach, Germany

Visiting researcher for the workshop *Proof Complexity and Beyond*.

Spring 2024

Chalmers University of Technology

Gothenburg, Sweden

Visiting researcher for the *Workshop on Algebra and Computation*.

Summer 2023

Simons Institute for the Theory of Computing at UC Berkeley

Berkeley, CA, USA

2-month visiting graduate student for the program *Satisfiability: Extended Reunion*.

Spring 2023

Honors and Scholarships

- *Oberwolfach Leibniz Graduate Student*; Mathematisches Forschungsinstitut Oberwolfach, 2024
- Accepted as **WASP** affiliated student, 2021
- *Mittag-Leffler Prize for outstanding M.Sc. theses in mathematics*; Stockholm University, 2021
- *Ingenjör Ernst Johnson Scholarship for outstanding academic achievements*; KTH, 2020, 2021
- *Henrik Göransson Sandviken Scholarship for outstanding academic achievements*; KTH, 2018
- *University Merit Scholarship for outstanding academic achievements*; KTH, 2018, 2019, 2020, 2021

Service

Reviewed papers for the following venues:

- Conferences: FOCS '22, CCC '22, CCC '23, SAT '23, SAT '24, ICALP '24, AAI '23, AAI '24, SODA '25, STOC '25
- Journals: Transactions on Computational Logic, Theoretical Computer Science, SIAM Journal on Discrete Mathematics

Teaching Experience

Lund University

- EDAA40/75 Discrete Structures in Computer Science, 2022, 2024, 2025
- EDAN55 Advanced Algorithms, 2023, 2024
- EDAN01 Constraint Programming, 2022, 2023

KTH Royal Institute of Technology

- SF1661 Perspectives on Mathematics, 2018
- SF1624 Algebra and Geometry, 2017

Work Experience

AP3 Third National Swedish Pension Fund

ILS Intern

Quantitative analysis of insurance-linked securities (ILS).

Stockholm, Sweden

2019-2021

Technical Skills

Programming: Python, Go, \LaTeX , Julia, MATLAB

Software: RMS Miu