Alexandre Nolin — Postdoc in Theoretical Computer Science

CISPA Helmholtz Center for Information Security – Saarbrücken, Germany

✉ alexandre.nolin@cispa.de • 🌐 www.irif.fr/~nolin

Research interests

Distributed computing: algorithms and lower bounds in synchronous models, e.g., Local and Congest, and asynchronous models to a lesser extent.

Communication complexity: algorithms and lower bounds, especially in connection with distributed computing.

Quantum computing: nonlocal behaviors and general algorithmic techniques.

More broadly, I am interested in restricted models of computation, in particular those with locality effects, and algorithms within these models.

Employment

CISPA Helmholtz Center for Information Security	**Saarbrücken, Germany**
Postdoc, group of Sebastian Brandt	*2022 – now*
ICE-TCS, School of Computer Science, Reykjavik University	**Reykjavik, Iceland**
Postdoc (Nýdoktor), hosted by Magnús M. Halldórsson	*2020 – 2022*
IRIF, Paris Diderot University*	**Paris, France**
ATER, Temporary Research and Teaching Attaché	*2018–2019*
IRIF, Paris Diderot University*	**Paris, France**
Contractual PhD candidate, 3 year grant awarded by Paris Diderot University	*2015–2018*

Education

IRIF, University of Paris*	**Paris, France**
Theoretical Computer Science PhD	*2015–2020*
Thesis: "Communication complexity: large output functions, partition bounds, and quantum nonlocality"	
Advisor: Sophie Laplante (Professeure, Paris Cité University)	
Paris Diderot University*	**Paris, France**
M2 MPRI	*2014–2015*
Research-oriented computer science Master program	
École polytechnique	**Palaiseau, France**
Engineering studies	*2011–2015*
"Efficient algorithms" specialization	
Lycée Hoche	**Versailles, France**
*MPSI and MP**	*2009–2011*
Math, physics and computer science studies preparing for the French competitive exams	

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*University of Paris was the result of a merger in 2019 that included Paris Diderot University. It was since renamed Paris Cité University.

Research internships

IRIF, Paris Diderot University*   **Paris, France**
5 months research internship   *2015*
Topic: "Lower bounds in quantum communication complexity"
Advisor: Sophie Laplante

LIX, École polytechnique   **Palaiseau, France**
4 months research internship   *2014*
Topic: "Computing eigenvectors of large graphs using spanning trees"
Advisors: Luca Castelli Aleardi and Maks Ovsjanikov

Publications

Journal papers

Superfast coloring in CONGEST via efficient color sampling   **Theor. Comp. Science**
with Magnús M. Halldórsson   *2023*
first appeared as a conference paper at SIROCCO 2021

Robust Bell inequalities from communication complexity   **Quantum**
with Sophie Laplante, Mathieu Laurière, Jérémie Roland, and Gabriel Senno   *2018*
first appeared as a conference paper at TQC 2016

Peer-reviewed conference papers

Faster Distributed Δ-Coloring via Ruling Subgraphs   **STOC**
with Yann Bourreau and Sebastian Brandt   *2025 (to appear)*

Decentralized Distributed Graph Coloring II: Degree+1-Coloring Virtual Graphs   **DISC**
with Maxime Flin and Magnús M. Halldórsson   *2024*

Content-Oblivious Leader Election on Rings   **DISC**
with Fabian Frei, Ran Gelles, and Ahmed Ghazy   *2024*
previously a brief announcement at PODC 2024

A Distributed Palette Sparsification Theorem   **SODA**
with Maxime Flin, Mohsen Ghaffari, Magnús M. Halldórsson, and Fabian Kuhn   *2024*

Fast Coloring Despite Congested Relays   **DISC**
with Maxime Flin and Magnús M. Halldórsson   *2023*

Coloring Fast with Broadcasts   **SPAA**
with Maxime Flin, Mohsen Ghaffari, Magnús M. Halldórsson, and Fabian Kuhn   *2023*

Distributed Coloring of Hypergraphs   **SIROCCO**
with Duncan Adamson and Magnús M. Halldórsson   *2023*

The Communication Complexity of Functions with Large Output   **SIROCCO**
with Lila Fontes, Sophie Laplante, and Mathieu Laurière   *2023*

Fast Distributed Vertex Splitting with Applications   **DISC**
with Magnús M. Halldórsson and Yannic Maus   *2022*

Overcoming Congestion in Distributed Coloring   **PODC**
with Magnús M. Halldórsson and Tigran Tonoyan   *2022*

Near-Optimal Distributed Degree+1 Coloring   **STOC**
with Magnús M. Halldórsson, Fabian Kuhn, and Tigran Tonoyan   *2022*

Superfast Coloring in CONGEST via Efficient Color Sampling   **SIROCCO**
with Magnús M. Halldórsson   *2021*

Coloring Fast without Learning your Neighbors' Colors DISC
with Magnús M. Halldórsson, Fabian Kuhn, and Yannic Maus 2020

Distributed Testing of Distance-k Colorings SIROCCO
with Pierre Fraigniaud and Magnús M. Halldórsson 2020

Robust Bell Inequalities from Communication Complexity TQC
with Sophie Laplante, Mathieu Laurière, Jérémie Roland, and Gabriel Senno 2016

Efficient and Practical Tree Preconditioning for Solving Laplacian Systems SEA
with Luca Castelli Aleardi and Maks Ovsjanikov 2015

Public preprints

Decentralized Distributed Graph Coloring: Cluster Graphs
with Maxime Flin, and Magnús M. Halldórsson 2024

Ultrafast Distributed Coloring of High Degree Graphs
with Magnús M. Halldórsson, and Tigran Tonoyan 2021

Awards

The Communication Complexity of Functions with Large Output SIROCCO
International Colloquium on Structural Information and Communication Complexity 2023
Best paper award, invited to special issue of Theoretical Computer Science

Superfast coloring in CONGEST via efficient color sampling SIROCCO
International Colloquium on Structural Information and Communication Complexity 2021
Best paper award, invited to special issue of Theoretical Computer Science

Robust Bell inequalities from communication complexity QIP
Conference series on Quantum Information Processing 2017
Best poster award

Talks

Invited talks

Coloring a Mostly Forgotten Graph WAND
Workshop on Analysis of Network Dynamics 2024
Madrid, Spain

Pseudorandomness: Some Distributed Applications ADGA
Workshop on Advances in Distributed Graph Algorithms 2023
L'Aquila, Italy

Contributed conference talks

Decentralized Distributed Graph Coloring II: Degree+1-Coloring Virtual Graphs DISC
International Symposium on Distributed Computing 2024
Madrid, Spain

Distributed Coloring of Hypergraphs SIROCCO
International Colloquium on Structural Information and Communication Complexity 2023
Alcalá de Henares, Spain

The Communication Complexity of Functions with Large Output SIROCCO
International Colloquium on Structural Information and Communication Complexity 2023
Alcalá de Henares, Spain

Fast Distributed Vertex Splitting with Applications DISC
International Symposium on Distributed Computing 2022
Augusta, Georgia, USA

Overcoming Congestion in Distributed Coloring — **PODC**
ACM Symposium on Principles of Distributed Computing — *2022*
Salerno, Italy

Superfast coloring in CONGEST via efficient color sampling — **SIROCCO**
International Colloquium on Structural Information and Communication Complexity — *2021*
held online

Coloring fast without learning your neighbors' colors — **DISC**
International Symposium on Distributed Computing — *2020*
held online

Distributed testing of distance-k colorings — **SIROCCO**
International Colloquium on Structural Information and Communication Complexity — *2020*
held online

Robust Bell inequalities from communication complexity — **TQC**
Theory of Quantum Computation, Communication and Cryptography — *2016*
Berlin, Germany

Efficient and practical tree preconditioning for solving Laplacian systems — **SEA**
Symposium on Experimental Algorithms — *2015*
Paris, France

Other talks

A near-tight deterministic distributed algorithm for Brooks' theorem — **NPA**
Network and Performance Analysis team seminar, LIP6 Sorbonne Université/CNRS — *2025*
Paris, France

Coloring a mostly forgotten graph — **TALGO**
Theory, Algorithms, Graphs and Optimization team seminar, ENS Paris — *2024*
Paris, France

Recent advances in distributed graph coloring — **ACES**
Autonomous Critical Embedded Systems team seminar, Télécom Paris — *2024*
Palaiseau, France

Recent advances in distributed coloring
Seminar at Télécom Paris — *2023*
Palaiseau, France

The communication complexity of functions with large output — **ICE-TCS**
Icelandic Center of Excellence in Theoretical Computer Science seminar, Reykjavik University — *2019*
Reykjavik, Iceland

The communication complexity of functions with large output — **FILOFOCS**
French-Israeli workshop on foundation of computer science — *2019*
Tel Aviv-Yafo, Israel

The communication complexity of functions with large output — **CoA**
Complexity and algorithms workshop — *2019*
Roscoff, France

Quantum, a look through nonlocality
IRIF PhD students seminar — *2018*
Paris, France

Teaching experience

Saarland University — **Saarbrücken, Germany**
As seminar organizer — *2024–2025*

L2∼M1: Impossibility Results for Local Algorithms (2025)
L2∼M1: An Extravaganza of Algorithmic Models (2024)
Small (∼10 students) seminar, with students presenting research papers
Shared responsabilities with Sebastian Brandt (CISPA)

As teaching assistant (2023) and backup lecturer   *2023–2024*
L2∼M1: Distributed Graph Algorithms
Small (∼10 students) advanced course

Reykjavik University   **Reykjavik, Iceland**
As lecturer   *2021–2022*
L2: Algorithms
Large (150∼200 students) mandatory introductory course.
In charge of half the course, other half taught by Manuela Fischer (now at ETH-Z)

Occasional assistance (replacement lecturer or teaching assistant for a few sessions)   *2020-2022*
L3: Advanced algorithms
Graph theory
Randomized algorithms
L2: Algorithms

Université Paris Diderot   **Paris, France**
As teaching assistant   *2015–2019*
L3: Programming in C
L2: Tools for the analysis of algorithms
OO programming and GUIs
Computer science project
L1: Internet and tools
Principles of operation of binary machines

École polytechnique   **Palaiseau, France**
As teaching assistant   *2014–2015*
M1: Algorithmic riddles
significantly reshaped the course together with Steve Oudot (INRIA)

Lycée Jean Jaurès   **Montreuil, France**
7 months internship   *2011–2012*
Mathematics tutoring from the 6th to the 12th grade, and above (preparatory classes)

Academic activities

Program committee work
○ Program committee member for PODC 2025
○ Program committee member for ICDCN 2025
○ Program committee member for SIROCCO 2024

Other conference committee work
○ Proceedings chair for PODC 2023

Journal reviews
○ IEICE Transactions on Information and Systems

Conference subreviews
○ IEEE Symposium on Foundations of Computer Science (FOCS)
○ ACM Symposium on Principles of Distributed Computing (PODC)
○ ACM Symposium on Theory of Computing (STOC)
○ ACM-SIAM Symposium on Discrete Algorithms (SODA)

- ○ International Symposium on Distributed Computing (DISC)
- ○ International Colloquium on Automata, Languages, and Programming (ICALP)
- ○ IEEE International Conference on Distributed Computing Systems (ICDCS)
- ○ Innovations in Theoretical Computer Science Conference (ITCS)
- ○ International Symposium on Mathematical Foundations of Computer Science (MFCS)
- ○ Symposium on Theoretical Aspects of Computer Science (STACS)

- ○ IEEE International Symposium on Information Theory (ISIT)
- ○ International Conference on Principles of Distributed Systems (OPODIS)

- ○ Conference series on Quantum Information Processing (QIP)

Other
- ○ Help with the local organization of the 2022 Logic Colloquium, at Reykjavik University, Iceland
- ○ Volunteer work for the 59th Symposium on Foundations of Computer Science (FOCS 2018), in Paris, France

Languages

French: Mother tongue

English: C2   *TOEFL iBT 112/120 in 2015*

German: B2~C1   *rusty*

Programming skills

Used on a regular basis: Python, Bash

Used somewhat recently: Java, C, PHP, HTML, CSS, SQL

Not used in a while: C++, JavaScript, Octave, Caml