

MR HAI CHÂU NGUYÊN

Lyon, France

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PROFILE

PhD student in Mathematics at Institut Camille Jordan, Université Claude Bernard Lyon 1. My research lies at the interface of category theory, differential geometry and mathematical physics — in particular geometric classical and quantum field theory. I am also interested in teaching advanced undergraduate and master's level mini-courses in linear algebra, representation theory, functional analysis, differential geometry and mathematical physics.

EDUCATION

PhD student in Mathematics, Institut Camille Jordan, Université Claude Bernard Lyon 1 2024–Present
Team PSPM (Probabilités, Statistiques, Physique Mathématique).
Under the supervision of [Alessandra Frabetti](#) & [Leonid Ryvkin](#).

Master's degree in Mathematics – Mathematical Physics Program, ENS de Lyon 2023–2024

Agrégation externe de mathématiques, ENS de Lyon 2021–2022
French national competitive examination for teaching mathematics, ranked 17th.

Advanced Bachelor's and Master's level coursework in Mathematics, ENS de Lyon 2019–2021

RESEARCH INTERESTS

- Equivariant bundles, representations of groupoids.
- Orbifolds and configuration spaces.
- Poisson-type structures and algebraic structures in mathematical physics.
- Category theory, monoidal structures.
- Distributions, functional analysis.

POSSIBLE MINI-COURSE TOPICS

- Symmetries, group actions and representations in mathematical physics.
- Functional analysis and Hilbert spaces for mathematical physics.
- Differential geometry and Hamiltonian or Poisson structures.
- Linear algebra, spectral methods and applications.
- Configuration spaces, tensor constructions and equivariant geometry.

PUBLICATIONS AND PREPRINTS

- *Equivariant Poisson 2-Algebra Bundles over Configuration Spaces.* [arXiv:2605.05398](#)

WORKS IN PROGRESS

- *Geometric Schur Functor for \mathbb{S} -Equivariant Vector Bundles.*

TALKS

- *Monoidal Structure of Cone Bundles over Multiconfiguration Spaces*, Observables, Actions and Quantization, IECL Metz, 9 July 2025. [OAK1](#)
- *La géométrie de l'harmonie musicale*, 20th anniversary of Institut Camille Jordan, 6 November 2025.
- *Observables in Classical Field Theory as Integral Kernels*. Half-day meeting of the PSPM team.

- *A Geometric Approach to Multilocal Observables on Multiconfiguration Spaces*, Observables, Actions and Quantization, IECL Metz, 22 June 2026. [OAK2](#)
- *From Local Observables to Multilocal Observables via Configuration Spaces*, 2nd International Workshop on Geometric Field Theory, Faculty of Physics Warsaw, 6-8 July 2026. [IWGFT26](#)

RESEARCH EXPERIENCE

Master's research project Orbifolds, vector bundles over orbifolds and configuration spaces. [Report](#)

- Studied orbifolds through atlases and groupoids, differential calculus on orbifolds, and vector bundles over orbifolds.
- Investigated quotient spaces of the form M^n/\mathfrak{S}_n and their role as configuration-type spaces.

Master's research project Representations of Lie algebras and physical interpretations. [Report](#)

- Studied algebraic Lie theory and representation theory, with motivations from theoretical physics.

Bachelor's research project Classification of complex Lie algebras, physical applications and quivers. [Report](#)

- Introduction to algebraic Lie theory and applications to modern theoretical physics.
- Gave an oral presentation at ENS de Lyon and a short presentation for CPGE-level students.

TEACHING EXPERIENCE

Oral mathematics examiner, second-year undergraduate level Université Claude Bernard Lyon 1 2024–2026

Oral mathematics examiner in CPGE Lycée du Parc, Lyon 2020–2021 & 2022–2024
Classes: MPSI, PCSI, MP*, PC*.

Oral mathematics examiner in CPGE Lycée La Martinière Monplaisir, Lyon 2022–2023
Class: MPSI.

Private tutoring and academic support ENSeigner

OUTREACH AND SERVICE

- Jury member and jury president at TFJM², French tournament for young mathematicians [TFJM²](#)
- Contributor to corrected oral-exam exercises for the RMS. [RMS](#)
- Co-author of *Annales corrigées MP/MPI de Mathématiques 2023–2024*, H&K editions. [Book](#)
- Participated in the 2024 Fête de la Science in Lyon with a mathematical card-magic show.
- President of the organizing committee of the 2020 ENS de Lyon Gala.
- Student representative for L3, M1 and M2 cohorts.

ADDITIONAL BACKGROUND

Mathematics	Advanced algebra, advanced analysis, advanced geometry, Riemannian geometry, Riemann surfaces, algebraic topology, symplectic geometry, groupoids.
Physics	Minor track in physics at ENS de Lyon: quantum mechanics, general relativity, quantum information.
Programming Languages	Python, \LaTeX . French, English.