

Loris Delafosse

Ph.D. student in Quantum information theory
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CURRICULUM

- **Magistère of Fundamental Physics** 2025
University of Strasbourg *Mention Assez Bien* (with honours)
- **M.Sc. Subatomic and Astroparticle Physics** 2025
University of Strasbourg *Mention Assez Bien* (with honours)
- **European Master certificate in Quantum Science and Technology** 2023 - 2024
DigiQ-EFEQT - European Quantum Flagship
- **B.Sc. Advanced Mathematics and Physics** 2023
University of Strasbourg *Mention Bien* (with high honours)
- **Classe préparatoire MPSI/MP* (Mathematics and Physics)** 2020 - 2022
Lycée Malherbe, Caen, France *Mention Très bien* (with highest honour)
- **Baccalauréat - Scientific Series** 2020
Lycée François Ier, Le Havre, France *Mention Très Bien* (with highest honour)

RESEARCH ACTIVITIES

- **Research Intern** 2025
Theory Group, Department of Subatomic Research, IPHC, CNRS/University of Strasbourg 6 months
 - Tutored by Pr. Michel RAUSCH DE TRAUBENBERG and Dr. Quentin BONNEFOY (MCF), works on topological approaches to generalized symmetries in high-energy physics.
- **Student Researcher** 2023 - 2025
Geometry for Quantum Science Group, Quantum Science and Nanomaterials Institute, University of Strasbourg
 - Founds a student-led laboratory working on screw theory, semi-classical physics, categorical quantum mechanics.
- **Research Intern** 2023 - 2024
Quantum Chemistry Laboratory, Strasbourg Institute of Chemistry, CNRS/University of Strasbourg 3.5 months
 - Tutored by Dr. Saad YALOUZ (CR CNRS), develops analytical formulae for Orthogonally Constrained CASSCF to describe molecular excited states.
 - Tutored by Pr. Vincent ROBERT, obtains numerical results on the RSBW perturbation theory.
- **Intern** 2023
Charles Sadron Institute, CNRS 10 days

TEACHING AND MENTORING ACTIVITIES

- **Overseeing of Seconde (10th grade) interns** 2023 - 2024
Quantum Chemistry Laboratory, Strasbourg Institute of Chemistry, CNRS/University of Strasbourg 2 weeks
 - Introduces the interns to the basics of Quantum Mechanics and Chemistry.
- **Tutoring** 2023 - 2025
Faculty of Physics and Engineering, University of Strasbourg 30 hours
 - Gives seminars for 3rd to 5th year students on tensor calculus, quantum mechanics and classical field theory.
 - Helps 1st to 3rd year students with classical and quantum mechanics, mathematical methods, quantum chemistry.

ADMINISTRATIVE CAPACITIES IN THE ACADEMIA

• Quantum Science and Nanomaterials

2024 - today

Interdisciplinary Thematic Institute of the University of Strasbourg

- Student representative to QMat’s Extended Executive Committee.
- Board member of the Young Investigators Group, QMat’s student organisation.
- Editor to the *Strasbourg Students Physical Letters*, QMat’s student-led scientific journal.

• ARIANE

2023 - 2024

Student association of the Faculty of Physics and Engineering, University of Strasbourg

1.5 years

- Deputy Vice-President in charge of Tutoring.

PUBLICATIONS IN PEER-REVIEWED LITTERATURE

- L. Delafosse and R. Beauclaire, “Formalizing SE(3) with Generalized Screws in 3D Geometric Algebra”, 2025, *Phys. Scr.* **100** 046104, doi:10.1088/1402-4896/adc213
- L. Delafosse, “Formalizing Screw Theory with 3D Geometric Algebra”, 2024, *Phys. Scr.* **99** 056102, doi:10.1088/1402-4896/ad3787
- L. Delafosse, A. Hussein, S. Yalouz and V. Robert, “A two-step Rayleigh-Schrödinger Brillouin-Wigner approach to transition energies”, 2024, *Electron. Struct.* **6** 015009, doi:10.1088/2516-1075/ad28f1

TALKS

- 15/09/25. (Organiser & contributed talk.) Young Investigators Congress, Quantum Science and Nanomaterials Institute, University of Strasbourg.
- 03/06/25. (Organiser & contributed talk.) Student symposium on quantum sciences, Faculty of Physics and Engineering, University of Strasbourg.
- 11/02/25. (Contributed talk.) Scientific meetings of the Strasbourg Quantum Chemistry Laboratory.
- 04/06/24. (Organiser & contributed talk.) Student seminar on quantum sciences, Faculty of Physics and Engineering, University of Strasbourg.

OTHER SCIENTIFIC PRODUCTIONS

- L. Delafosse, “Symmetries and classical fields”, 2025, *2SPL* **01** 0203
- L. Delafosse, “A construction of the quantum state space”, 2024, *2SPL* **01** 0202
- L. Delafosse, “Tensor calculus for physicists”, 2024, *2SPL* **01** 0201, hal-04722859v1
- L. Delafosse, “Teaching Quantum Mechanics to Seconde Interns”, 2024, *2SPL* **01** 0102
- L. Delafosse, “A New Approach to Screw Theory using Geometric Algebra”, 2023, hal-04177875v3

2SPL: Strasbourg Students Physical Letters

LANGUAGES AND TECHNICAL SKILLS

• German & English

is able to sustain a conversation, read technical documents in Mathematics, Physics and Engineering

• Russian

is able to read simple texts, or to translate more difficult texts with a dictionary

• LaTeX

uses LaTeX commonly, notably usual packages for Mathematics, Physics and Chemistry (amsmath, physics, chemfig, etc.)

• Python & C++

usual algorithms for differential and integral calculus, functional and object-oriented programming