

Gabriele Novelli

📍 Bologna/Modena ✉ 378046@studenti.unimore.it ☎ +39 327 699 44 92

🌐 <https://www.mathphd.unimore.it/phd-students/> 🌐 <https://github.com/GabrieleNovelli/Universit->

Education

University of Bologna UNIBO, Bachelor degree: Physics

September 2020 – July 2023

- **Graduated** with 110/110 cum Laude;
- **Thesis:** Lie groups and representation theory: the quantization of angular momentum
Thesis supervisor: Fioresi Rita

University of Bologna UNIBO, Master degree: Theoretical Physics

September 2023 – July 2025

- **Graduated** with 110/110 cum Laude;
- **Thesis:** The geometry of the Yang-Mills theory
Thesis supervisor: Fioresi Rita;
Thesis co-supervisor: Bastianelli Fiorenzo.
- **Highlight of my coursework:** String theory, Group theory, Knot theory, Advanced QFT;
- **Erasmus:** I have spent 6 months in Belgium at UC-Louvain during my first year of Master.

Experience

Ph.D., Mathematics, The geometry of Deep Learning

UNIMORE

November 2025 – Ongoing

- Currently a Ph.D. student at the University of Modena and Reggio Emilia, in collaboration with the University of Ferrara.
- My research focuses on developing the mathematical and geometrical framework for neural networks. There is particular attention to the study of non-smooth foliations of the Data Space in NN architectures, through the use of diffeology, stratification theory and the Stefan-Sussmann theorem.
- Supervisor: Fioresi Rita;
Co-Supervisor: Latini Emanuele.

Tutoring activity of Mathematics and Physics at UNIBO for the faculties of: Biotechnologies, CTF, Pharmacy and Genomics.

UNIBO

November 2022 –

November 2025

- My role was to assist professors during exams, correct homework and written exams, and hold occasional lectures to students.

Schools, 46th winter school in geometry and physics, Srni

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January 2026

- I have participated at the 46th winter school in geometry and physics in Srni, Czech Republic, in which I have presented my thesis work as a poster: The geometry of the Yang-Mills theory.

Languages

- English B2, however my whole master degree was held in english;
- Spanish A1;

- French A1.

Skills

Programming skills

- I can program in C++ and in Python, and I have experience developing basic Neural Networks through PyTorch. I have had both a C++ and a Python exam during my formation as a physicist.
- Solid knowledge of all basic utility programs and data analysis tools such as Word, LaTeX, Excel;

Soft skills

- I can work in groups and have strong leadership abilities in such contexts.
- I am capable of performing under pressure. As a matter of fact, I graduated both times in the first session available, with maximum grade.
- I am highly reliable in delivering work on time.

Personal Skills

- I have a solid knowledge of differential geometry. Both of my theses have been devoted to the application of such a framework to physics.
- I have a driver's license since 2021;
- I can play the Piano and the Guitar.