Marco Belli

✉ *mbelli@student.ethz.ch*
bellimarco.github.io

Education

2024-Present **MSc, Mathematics**, ETH Zürich.

Fall 2024 Exchange semester: University of Texas at Austin.

2021-2025 **BSc, Mathematics**, ETH Zürich.

Research Interests

Complex and algebraic geometry, algebraic curves, Abelian varieties and the moduli spaces related to them. Number theory and applications to cryptography.

Works

Master's thesis: The intermediate Jacobian of the cubic threefold (*draft*) - website.

The isomorphism to Čech cohomology as evaluation on the Čech nerve (2025) - arXiv:2510.21486.

Getzler-Kapranov graph complex cohomology computations in weight 13 (2025) - arXiv:2507.08995.

Riemann Surfaces as an elementary theory for the solvability of analytic equations (2025) - website.

Bachelor's thesis: On the construction of Hilbert and Quot schemes (2024) - website.

Academic Experience

Fall 2025 Exam correction, Linear Algebra and Complex Analysis, ETH Zürich.

Spring 2025 Exam correction, Topology and Basic Structures, ETH Zürich.

Spring 2025 Teaching assistant, Algebra II, ETH Zürich.

2024-2025 Private tutoring, various subjects, EduQuant platform.

Fall 2024 Exam correction, Complex Analysis, ETH Zürich.

Spring 2024 Teaching assistant, Analysis II, ETH Zürich.

Spring 2023 Teaching assistant, Mathematics II, ETH Zürich.

References

Thomas Willwacher, Professor, ETH Zürich, *thomas.willwacher@math.ethz.ch*.
Supervisor of my Getzler-Kapranov computations project.

Bernd Siebert, Professor, University of Texas at Austin, *siebert@math.utexas.edu*.
Instructor of a moduli spaces seminar I attended at UT Austin.

Samir Canning, Hermann-Weyl-Instructor, ETH Zürich, *samir.canning@math.ethz.ch*.
Supervisor of my bachelor's and master's theses.

Alessandro Giacchetto, Hermann-Weyl-Instructor, ETH Zürich, *alessandro.giacchetto@math.ethz.ch*.
Supervisor of my reading course on complex geometry, based on Huybrechts' textbook.

Attended Conferences

Sep 11-19 2025 Nairobi Workshop in Algebraic Geometry, University of Nairobi, Kenya.

Jun 9-13 2025 Harmonies in Moduli Spaces, Università Roma Tre, Italy.

Internships

Sep-Nov 2025 Dedan-Kimathi University of Technology, Nyeri, Kenya. Department of robotics and mechatronics. Tasks: assisting students with various final-year robotics projects.

Hard Skills

Programming: C++, Python, SQL, Processing, Javascript, basic client and server side.

Software: Mathematica, Maple, Lean, SageMath, Matlab/Simulink, Siemens TIA, Fusion360.

Robotics and mechatronics: kinematics and dynamics, ROS, Raspberry Pi ecosystems, integrating microcontrollers with sensors and actuators, control systems, basic electrical engineering.

Other Interests

Building robots and DIY projects (github portfolio: *bellimarco*).

History of Science, Physics, Logics, Computer Formalization.

Literature, Languages, Traveling, Hiking.

Personal Information

Birth details 2001, Lugano

Citizenship Swiss, Italian

Languages Italian, Russian (native), English (C1), German, French (fluent)

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Cover Letter

I am completing my Master's of Science in Mathematics at ETH, following a BSc at the same institution, with the aim to continue my journey toward a research career in pure mathematics. My interests lie primarily in complex and algebraic geometry, in particular algebraic curves, Abelian varieties, and the moduli spaces related to them, with secondary interests in number theory and its cryptographic applications.

Currently, I am writing my master's thesis under the supervision of Dr. Samir Canning, in which I aim to develop a solid understanding of Abelian and Prym varieties. To this end, I am studying in detail the paper of Clemens and Griffiths on the intermediate Jacobian of the cubic threefold, which serves as an excellent case study and will further deepen my background in Hodge theory. I also plan to cover general transcendental methods used to obtain birational information.

Over the course of 2025, I have undertaken three projects, listed in my curriculum vitae. The first one, carried out under the supervision of Prof. Thomas Willwacher, concerns the Getzler-Kapranov graph complex, extending recent cohomological results obtained by him, Dr. Canning and their collaborators. Working closely with him taught me essential research skills and familiarized me with a significant body of literature on the moduli space of curves, its cohomology, and the graph-theoretic models used to compute cohomology classes. This project demonstrates both my aptitude for research and my ability to engage with challenging material.

The other two projects were undertaken on my own initiative and were not part of my MSc degree. In one, I gave a computable description of the isomorphism between singular and Čech cohomology, which strengthened my understanding of homological algebra and the relationships among various cohomology theories. In the other, I wrote notes on the solvability of analytic equations. The motivation was to bring into a modern, rigorous setting the idea that algebraic functions expressible in terms of radicals have solvable monodromy, whereas other algebraic functions might have non-solvable monodromy, giving a topological version of the Abel-Ruffini theorem. Although more elementary in subject, these projects highlight my capacity for independent work and my motivation to explore mathematics beyond mandatory coursework.

Some topics that I studied on my own and that do not appear in the transcripts include Hurwitz theory, complex geometry, homotopy theory, and number theory. My Bachelor's thesis, also supervised by Dr. Canning, was my first introduction to moduli spaces, in particular the Grassmannian, Hilbert, and Quot schemes. During this work, I learned to use category theory in a very practical way, for example by constructing the moduli spaces of sheaves locally, and then applying gluing properties. The knowledge I gained allowed me to subsequently join and actively participate in a moduli spaces seminar held by Prof. Bernd Siebert during my exchange semester at UT Austin.

The experience that had the greatest personal impact on me during my university life was attending the 2025 Nairobi Workshop in Algebraic Geometry, organized by Prof. Balázs Szendrői. The workshop brought together students and researchers from across Africa and Europe. It gave me the opportunity to learn from people with backgrounds very different from my own and build lasting friendships with local students. For example, I met Isaiah Odhiambo, a bachelor's student at Maseno University in Kenya, whom I helped by offering guidance on his thesis.

In addition to my research experience, I have extensive academic experience with exam correction and teaching assistantship, both in English and in German, which has already accustomed me to the regular duties of a PhD student. After nearly five years of study, I can say that the university environment feels like home to me. I enjoy being surrounded by people who, like myself, are constantly learning and, at the same time, teaching the generation after them. I find great joy in discussing mathematics and passing it on to others, and I believe that doing so is a crucial part of discovering meaning in it. This is why I am looking to continue studying mathematics as a PhD student and, hopefully, for many years to come.

Sincerely,
Marco Belli