Marco Belli

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

Birth details	2001, Lugano
Citizenship	Swiss, Italian
Languages	Italian , Russian (native), English (C1), German, French (fluent)

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

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

Samir Canning, Hermann-Weyl-Instructor, ETH Zürich, *samir.canning@math.ethz.ch*

Alessandro Giacchetto, Hermann-Weyl-Instructor, ETH Zürich, *alessandro.giacchetto@math.ethz.ch*

Thomas Willwacher, Professor, ETH Zürich, *thomas.willwacher@math.ethz.ch*

Bernd Siebert, Professor, University of Texas at Austin, *siebert@math.utexas.edu*

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, Department of Robotics and Mechatronics, Kenya.

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.

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Cover Letter

I am writing to express my strong interest in a PhD programme. I am currently completing my Master's degree in mathematics at ETH Zürich, following a BSc at the same institution, and I am aiming to continue my journey toward a research career in pure mathematics. My interests lie primarily in complex and algebraic geometry, in particular complex curves, abelian varieties, and the moduli spaces related to them. I have secondary interests in number theory, arithmetic geometry, and its cryptographic applications.

Currently, I am working on 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, 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 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 – an attempt to bring into a modern, rigorous setting the topological version of the Abel–Ruffini theorem as outlined in a book by V. B. Alexeev. Although more elementary in subject, these projects highlight my capacity for independent work and my motivation to explore mathematics beyond mandatory coursework. I was able to devote substantial time to these projects by completing early all coursework for my Master's degree during the year 2024.

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. 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 late issuance of my Bachelor's degree in July 2025 is due to a bureaucratic oversight regarding a language course not recognized by ETH.

In addition to my research experience, I also 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. 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,
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Sincerely,
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December 1, 2025

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Cover Letter

Dear Professor Rahul Pandharipande,

I am writing to express my strong interest in a PhD programme within your research group at ETH Zürich. I am currently completing my Master's degree in mathematics at ETH, following a BSc at the same institution, and I am aiming to continue my journey toward a research career in pure mathematics. My interests lie primarily in complex and algebraic geometry, in particular complex curves, abelian varieties, and the moduli spaces related to them, with secondary interests in number theory and its cryptographic applications. I am applying to your group because of its exceptional research environment and its central role in the broader network of geometers in the world. Having had extensive contact through courses, seminars, and supervision with some members of the group – such as Dr. Samir Canning, Dr. Alessandro Giacchetto and Dr. Johannes Schmitt – I am already quite familiar with their work, which aligns greatly with my research interests and my background.

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