Marco Belli

✉ *mbelli@student.ethz.ch*

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, Moduli Spaces, in particular the moduli space of curves.

Number Theory and applications to Cryptography.

Works

In progress Master's thesis: On the moduli space of Abelian varieties (*in progress*).

Spring 2025 Getzler-Kapranov graph complex cohomology computations in weight 13 (arxiv).

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

Spring 2024 Riemann Surfaces as an elementary theory for the solvability of analytic equations (drive).

Academic Experience

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

Spring 2025 Teaching assistant, Algebra II, ETH Zürich.

Spring 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*

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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Letter of intent

I am looking to continue studying mathematics at a higher academic level, and in particular to finally research something of my own. Long term, I see myself visiting many universities across the world as a postgraduate student, at least as long as I retain my burning passion for mathematics. Eventually, depending upon the chances presenting themselves, I would consider a professorship or pivoting to industry in Cybersecurity or a closely related field.

I am interested in studying geometry. From my limited experience, the most general framework in which this can be done is currently Algebraic Geometry, so I want to focus on this field of mathematics with a view towards the big classical and historical geometrical problems. I am also interested in the study of moduli spaces, in their own right but also as a bookkeeping tool for classification problems.

In addition, I would be also interested in the applications of Algebraic geometry and Number Theory to Cryptography. I would like to research ways in which to exploit the difficulty of a mathematical problems to create secure and efficient Cryptographic protocols (like describing the group law of elliptic curves or prime factorization of integers).

Career Goals

My journey as an undergraduate mathematics student is about to end, and I enjoyed it so much that I am looking to extend my stay in the academic environment. That is way I am pursuing a career in academia, with a focus on research in pure mathematics. I am particularly interested in Algebraic Geometry and it's many neighbouring fields like Complex Geometry, Number Theory and to some extent also Low Dimensional Topology. In addition, I am interested in application areas of the above subjects, in particular Cryptography.

I am looking to continue studying mathematics at a higher academic level, and in particular trying to finally research something of my own. Long term, I see myself visiting many universities across the world as a postgraduate student, at least as long as I retain my burning passion for mathematics. Eventually, depending upon the chances presenting themselves, I would consider a professorship or pivoting to industry in Cybersecurity or a closely related field.

Research Goals

I am interested in studying geometry. From my limited experience, the most general framework in which this can be done is currently Algebraic Geometry, so I want to focus on this field of mathematics with a view towards the big classical and historical geometrical problems. I am also interested in the study of moduli spaces, in their own right but also as a bookkeeping tool for classification problems.

In addition, I would be also interested in the applications of Algebraic geometry and Number Theory to Cryptography. I would like to research ways in which to exploit the difficulty of a mathematical problems to create secure and efficient Cryptographic protocols (like describing the group law of elliptic curves or prime factorization of integers).

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Letter of motivation

My journey as an undergraduate mathematics student is about to end, and I enjoyed it so much that I am looking to extend my stay in the academic environment. Quite simply, I am applying for a doctoral programme in pure mathematics because I have a burning passion for it.

I am interested in studying geometry. From my experience, the most general framework in which this can be done is currently Algebraic Geometry, so I want to focus on this field of mathematics with a view towards the most classic, concrete geometric problems.

I am also interested in the study of moduli spaces, not only for their own sake as a bookkeeping tool for classification problems, but also as an algebraic tool.

In addition, I would be also interested in the applications to Cryptography of Algebraic geometry and Number Theory. I would like to research other ways in which it could be possible to exploit the difficulty of a mathematical problem to create secure and efficient Cryptographic protocols (like describing the group law of elliptic curves or prime factorization of integers).