

Ruben Leuzinger

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Projects

Home-built Scanning Tunneling Microscope (STM) Sep 2025 - Present

- Collaborating with LT to build a working STM that measures quantum tunneling current between a metallic tip and a sample, with the goal of atomic-scale spatial resolution.
- Designed the mechanical coarse-approach system, vibration isolation, and built custom PCBs for tunneling-current measurement and feedback control.

Boxcar Integrator on FPGA May 2026

- Collaborated on a project for the Digital Electronics course at ETH Zurich.
- Designed and implemented a custom boxcar integrator on an entry-level FPGA, used for second harmonic generation studies of materials with ultrashort pulses from an amplified laser system.

Hall-Effect Magnetic Field Sensor Nov 2025

- Designed and soldered my first custom PCB for a working magnetic field sensor, built for the Analogue Electronics course at ETH Zurich.

Smart Pass Manager: A Noise-Aware Transpiler Pass for Qiskit June 2025

- Developed a Python Qiskit transpiler plugin using graph-theoretic heuristics to map circuits onto the least-noisy subset of qubits on IBM noisy intermediate-scale quantum (NISQ) hardware.
- Links: Code, Short Paper

Das Doppelpendel: Zufall oder Chaos? Eine Analyse chaotischen Verhaltens Oct 2022

- Maturitätsarbeit supervised by Dr. Florian Leupold
- Simulated a double pendulum using Python and studied the chaotic behavior under consideration of phase-space structures and Lyapunov exponents.

Education

Eidgenössische Technische Hochschule Zürich (ETH Zurich), BSc in Physics Sep 2024 - Sep 2027

- **Noteworthy Courses:** theoretical and experimental physics, mathematics, data analysis, electronics, lab work

Kantonsschule Uster, Matura focused on Applied Mathematics and Physics July 2019 - July 2023

- **Noteworthy Courses:** Applied Mathematics, Python

Accomplishments and Honors

IBM Tech Talent Program Feb 2026 - Sep 2026

- Mentorship Program offered by IBM.

Hasler Excellence Scholarship Sep 2025 - Sep 2027

- Merit-based scholarship supporting undergraduate studies in physics at ETH Zurich.

Náboj International Mathematics Competition Mar 2023

- 1st place Switzerland. Náboj is an international Mathematics Team Competition for high-school students.

Swiss Physics Olympiad Sep 2022 - Mar 2023

- 16th place at the second round of the national physics Olympiad, qualifying for final round and training weekend in Lausanne.

Skills

Programming: C++, Python (with Qiskit)

Others: LaTeX, ECAD (KiCad, Altium), SystemVerilog, Quartus, CAD (Onshape), Linux (Ubuntu)

Languages: German (Native), English (Fluent), French (B2)