

# VINCENT CAUQUIL

Apprentice Research Engineer | Physics & Microelectronics Systems



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Apprentice Research Engineer with hands-on experience in **Cryogenic Electronics (4K)** and **Mixed-Signal IC Design**. Skilled in thermal budgeting for quantum setups and semiconductor physics. Seeking a PhD opportunity to advance **Computing Architectures** and develop **robust, high-speed acquisition interfaces** for quantum or constrained applications.

## EXPERIENCE

Apprentice Research Engineer  
**CEA-Leti | Quantum Devices Laboratory**



Sept 2023 – Sept 2026 Grenoble, France

**Focus:** Characterization and hardware development for quantum devices (FD-SOI & Cryogenics).

- **Cryogenic Circuit Design (4K):** Currently designing a multiplexing and amplification circuit (cryogenic I/V converters) managing 50 I/Os, targeting high-speed signal integrity and thermal compliance.
- **Device Physics:** Characterizing FD-SOI substrate polarization effects (body factor) at room temperature to model transistor behavior.
- **Process Optimization:** Developed an automated dicing method for 300mm wafers, aiming to increase yield and speed compared to manual cleaving.

Research Intern

**Institute of Science Tokyo**



July 2025 – Sept 2025 Tokyo, Japan

**Subject:** Cryogenic packaging and high-density interconnects.

- Designed an architecture using **off-the-shelf components** to enable the **sequential testing** of multiple quantum chips within a single cooling cycle.
- Addressed strict **thermal dissipation** and spatial constraints specific to cryogenic systems (cryostat).

## EDUCATION

Engineering Degree  
Physics & Microelectronic Systems (PSM)



**CPE Lyon - Class Valedictorian** 🏆

Sept 2023 – Sept 2026 Villeurbanne, France

- **Electronics & IC Design:** Analog/Mixed-Signal & RF Circuits, simple ASIC Design, Sensors & PCB Design.
- **Digital & Computing:** FPGA Architecture, HDL (Verilog/VHDL), RISC-V (LiteX), AI for Integrated Design (ML/RL for EDA).
- **Physics & Signal:** Semiconductor Device Physics, Quantum Mechanics & Computing, Digital Signal Processing.
- **Research Initiation:** Seminars by Centrale Lyon researchers & drafting of an IEEE review paper on Neuromorphic Processors (🔗 Read).

Intensive Undergraduate Program  
Mathematics & Physics (CPGE PSI)



**Institution des Chartreux**

Sept 2021 – Sept 2023 Lyon, France

Two-year intensive preparation for the highly competitive entrance exams to French "Grandes Écoles". Focus on rigorous analytical reasoning and physics modelling.

## LANGUAGES

French: Native

English: Professional (C1)

Spanish: Elementary

Japanese: Elementary

## SOFT SKILLS & INTERESTS

- **Leadership & Open-mindedness:** 🏢 Rep. & Project Lead Developed autonomy & coordination.
- **Creativity & Precision:** 🌌 Astronomy (Imagination & Problem-solving) 📸 Photography (Rigor).
- **Discipline & Strategy:** 🏊 Swimming (Perseverance) 🏸 Badminton (Adaptability).

## ACADEMIC PROJECTS

- **Smart Modular Parking (IoT/FPGA/Power):** Led the technical development and full system integration. Engineered the **RISC-V SoC** (LiteX/Custom Linux) on FPGA and full **BMS** architecture (RP2350/TI BQ IC's). 🛡 Repository

🏆 Most Technical Project Awarded at 2025 CPE Lyon Majors Competition

- **Mixed-Signal IC Design (Cadence):** Full design of a **2<sup>nd</sup> Order CT ΣΔ ADC** (50dB SNR, 64 OSR) and a 4-bit R-2R DAC. Validated via Monte-Carlo & Corner analysis.
- **AI Optimization for Standard Cells (Sky130):** Developed a Reinforcement Learning tool to optimize logic cells' **PPA** metrics via automated SPICE/DRC loops. 🛡 Repository

“ See detailed schematics, layouts, code and more project in my 🛡 portfolio ”

## TECHNICAL SKILLS

### Physics & Cryogenics:

Cryogenics (4K/Dilution)

Semiconductor Physics RF Concepts

Thermal Budgeting Quantum Devices

### EDA & Instrumentation:

Cadence Virtuoso Spectre / SPICE

KiCad Xilinx Vivado LabVIEW LTspice

### Programming:

Python 🐍 OpenCV PyTorch MATLAB

Verilog/VHDL HTML/CSS C/C++

Assembly 🐸 Linux/Bash MS365 📁 🗂️ 🖼