EPFL

16th April 2025

Rhonexum
– Unbound the boundaries of cryogenic electronics

In a nutshell

Rhonexum is a Swiss spin-off from EPFL's AQUA Lab, focused on enabling scalable cryogenic electronics for quantum computing, sensing, and high-performance systems. As electronics increasingly need to operate at cryogenic temperatures—from 77 K down to 4 K—the lack of mature infrastructure for modeling and measurement has become a major bottleneck for designers and system integrators.

To address this, Rhonexum develops specialized solutions for cryogenic circuit simulation and automated low-temperature device characterization, allowing faster, more reliable development of cryo-optimized electronics. Our technology is built to serve both research institutions and commercial partners, facilitating a smoother interface between device engineers and circuit designers.

In parallel, we are laying the groundwork to internally design selected cryogenic circuits using our tools and data—demonstrating best practices and generating reference designs to support early adopters.

By combining academic expertise, software development, and hands-on engineering, Rhonexum is helping to establish the foundation for a robust cryogenic electronics ecosystem.

Why is our technology important?

Rhonexum addresses this critical gap by providing the foundational infrastructure for simulation and measurement in cryogenic environments. Designers cannot confidently build circuits that work reliably at low temperatures without accurate models and validated data. Without fast, automated measurement, validating devices becomes slow, manual, and error-prone.

Our technology solves a core barrier in the cryogenic electronics workflow by enabling both high-fidelity modeling and streamlined characterization. It allows teams to move from raw device data to usable, design-ready models and from unpredictable lab behavior to repeatable, testable performance, dramatically accelerating the path from research to application.

In a landscape where quantum and cryogenic systems are scaling rapidly, our technology is essential to ensuring those systems are not just possible, but practical.

The benefits of our solution

- RX-Model - Cryogenic Circuit Simulation
  - Accurate cryogenic transistor simulation
  - Reduces design risk and iteration cycles
  - Integrates easily with standard EDA tools
- RX-AMS - Automated Measurement System
  - Fast, automated cryogenic measurements
  - High-throughput data for reliable modeling
  - Scalable for labs and R&D team
- Cryo-Onboarding & Expert Advising
  - Training for device and design teams
  - Speeds up integration and collaboration
  - Lowers the entry barrier for new users
- In-House Circuit Design (Proof of Capability)
  - First cryo circuit designed using RX-Model
  - Demonstrates full toolchain in action
  - Provides reference IP for early adopters

Keywords

Cryogenic, electronics, modeling, characterization, circuit design, automation, transistor, advanced computing.

Founding Team

Hung-Chi Han, Vicente Carbon