WE BUILD QUANTUM CONTROL INFRASTRUCTURE

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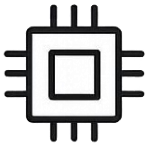
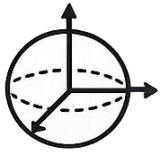
Why Qubit Controller

Applications	 Simulation, Cryptography, Optimization
Algorithms/Calibration	 Calibration, Control software
Control	 Low-power, high-performance control infrastructure for large-scale qubit systems
Qubits	 Physical qubits
Cryogenic Systems	 Ultra-low temperature environment

We are building the control layer for quantum computing

What We Build?	Low-power, high-performance qubit control infrastructure
What makes us different?	Compact pulse instructions 4K pulse remapping, routing, and local modulation Lower wiring, thermal load, and channel-count scaling pressure
What this becomes?	A high-performance cryogenic control platform for next-generation QPUs Helping qubit teams scale from tens of qubits toward tens of thousands

Alternative Technologies & Competitive Landscape

Room-Temperature Control Systems

- **Quantum Machines · Qblox · Zurich Instruments**
  - Mature AWG/RF/FPGA-based control systems with strong software and lab adoption.
  - **Limitation:** wiring, thermal load, and rack-scale complexity remain bottlenecks for large-scale qubit system.

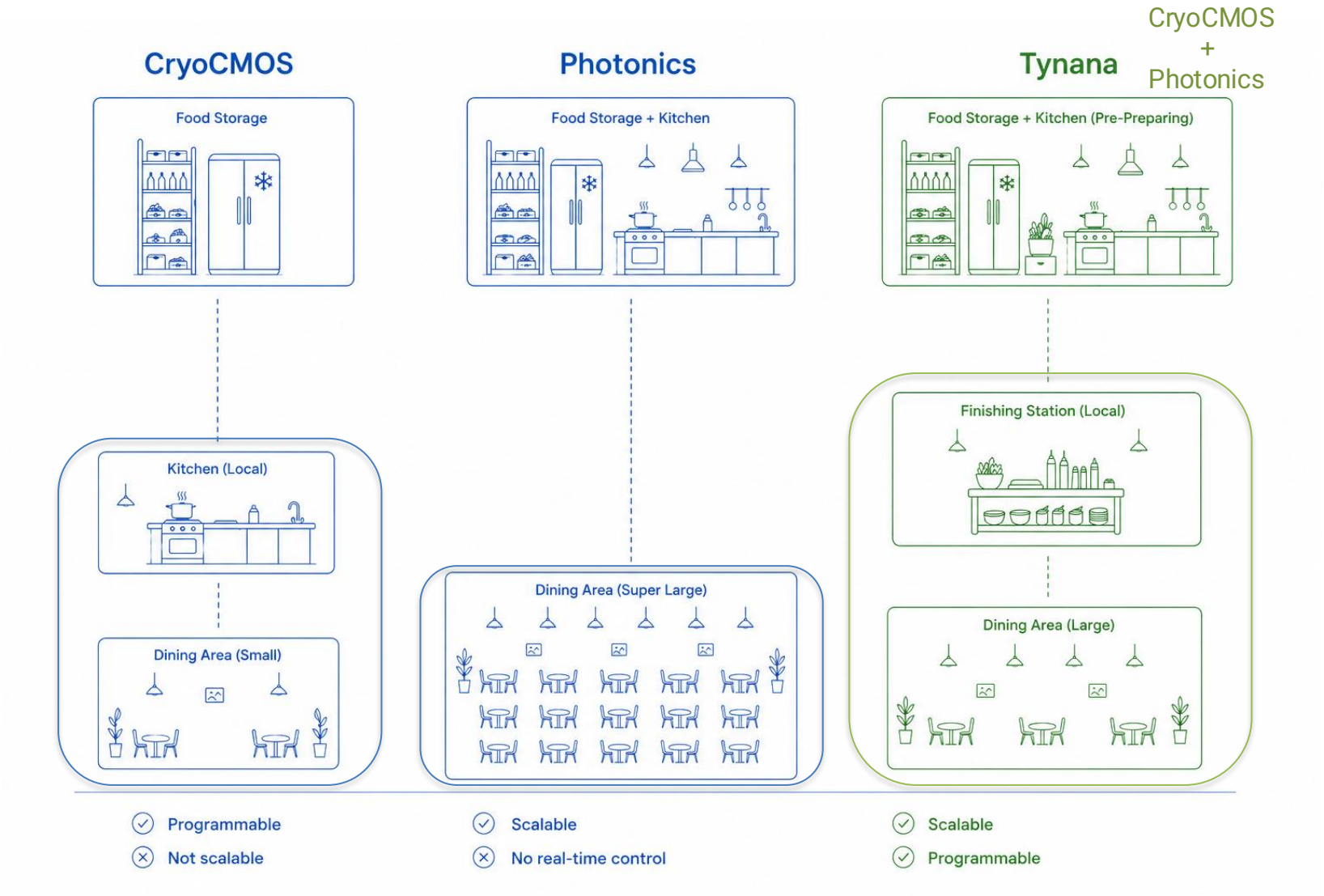
Cryogenic / Integrated Control Alternatives

- **SEEQC · SemiQon**
  - Move control electronics closer to the QPU through SFQ logic, **cryo-CMOS**, or cryogenic waveform generation
  - **Limitation:** cryogenic power budgets, often tied to specific device platforms. or full-stack architectures.

Photonics Control Alternatives Relevant IP Landscape

- **IBM(US11201686B1, US12026584B2) · University of Maryland/NIST (US11742955B2) · VTT Technical Research Centre of Finland Ltd (US12283995B2) · Anyon Systems (US11460877B2)**
  - Existing patents cover optical multiplexing, photonic links into cryogenic environments, cryogenic waveform generation, and hybrid photonic-solid-state quantum systems.
  - **Market Gap: no clear commercial photonic qubit-control product is publicly available.**

New Qubit Controller Architecture Analogy



Only Tynana gives both scale and real-time in-fridge programmability.

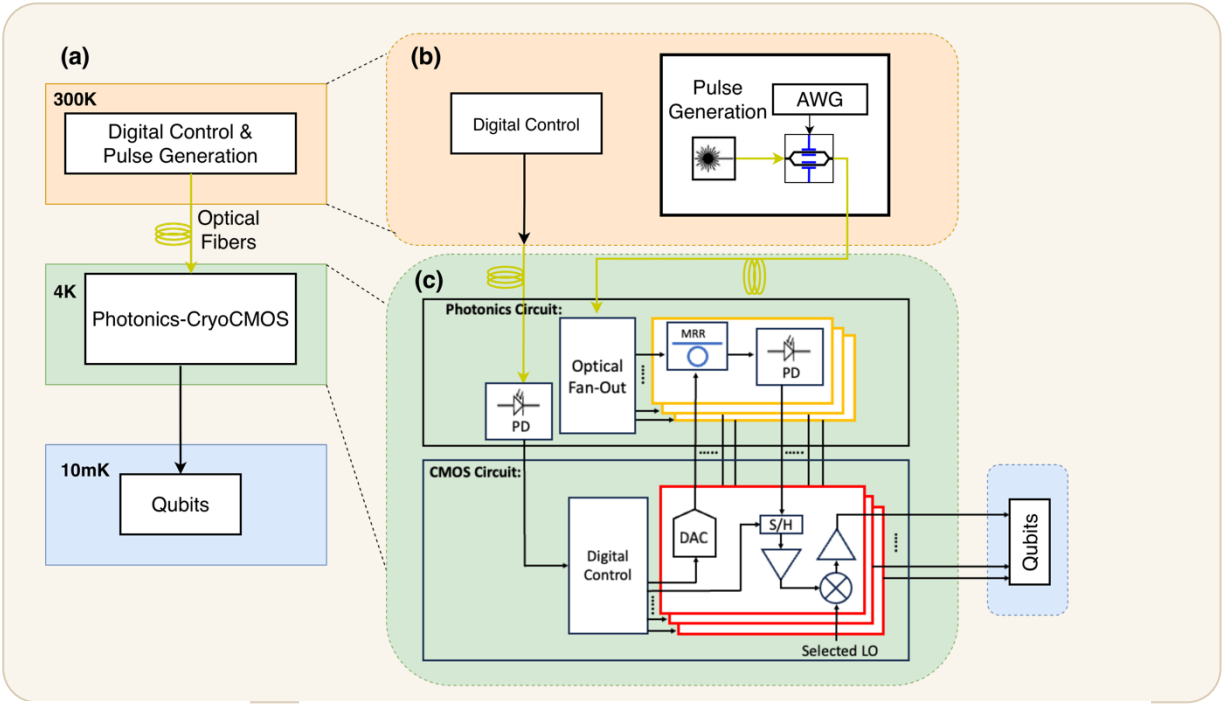
New Qubit Controller Architecture

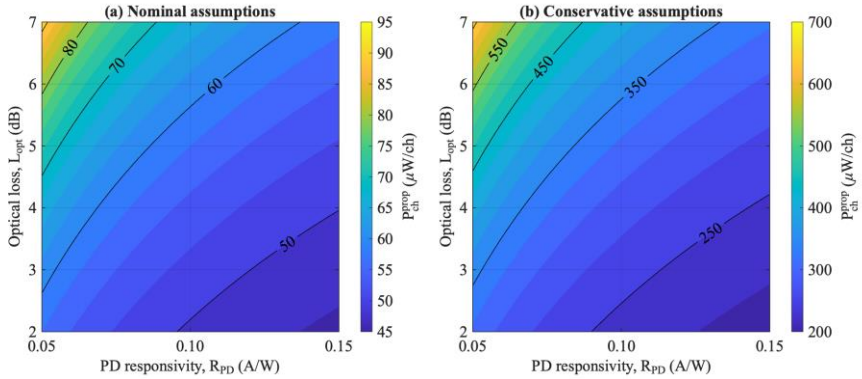
30× LOWER ACTIVE POWER
0.05–0.7 mW per Channel (est.)

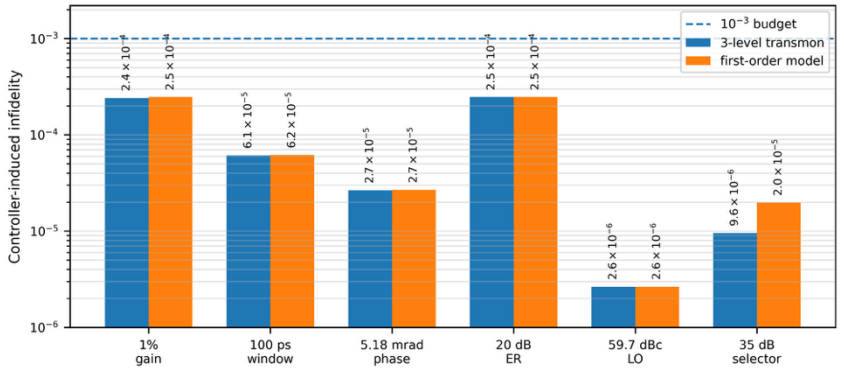
100× LESS CRYO MEMORY
Only parameters, not waveform memory

Higher In-fridge Programmability
Real-time feedback, programmability

99.9%+ Fidelity
Error budget 99.9%+ Gate fidelity

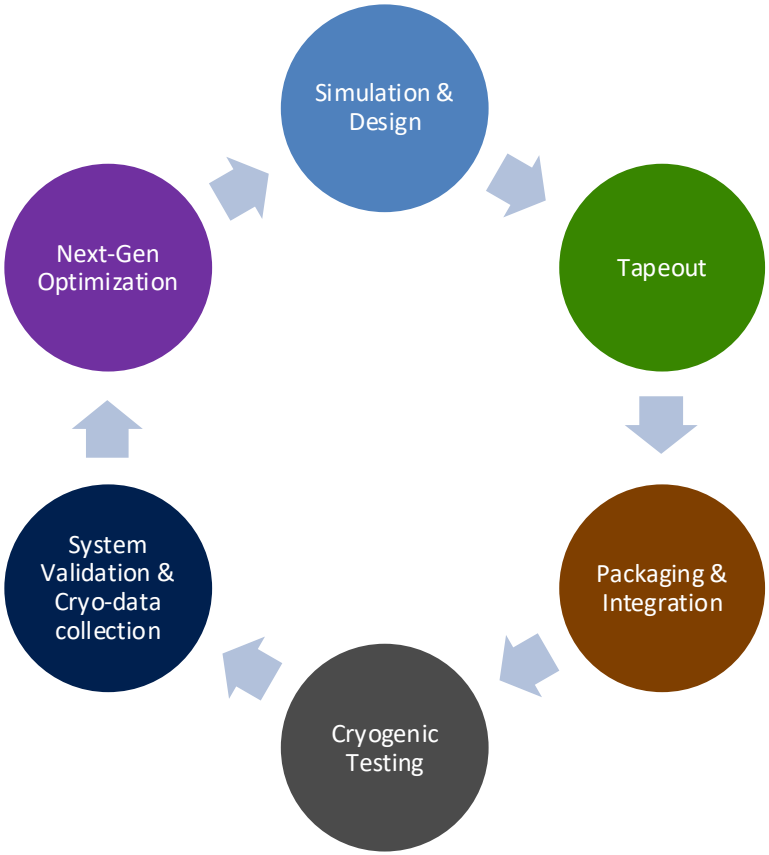






Patent Pending (USPTO Provisional Application No. 64/078,129 filed May 29, 2026)
https://arxiv.org/abs/2606.10114

Workflow


Simulation & Design
Tapeout
Packaging & Integration
Cryogenic Testing
System Validation & Cryo-data collection
Next-Gen Optimization

TYNANA: Infrastructure for Scalable Quantum Systems

Building scalable quantum-control and cryogenic packaging infrastructure

Phase 1: Core Demo

2026 – Mid 2027

- Tape out GF45SPCLO integration prototype in Oct 2026.
- Validate optical pulse delivery, Ge PD recovery, local cryo-CMOS correction, LO selection, and chip performance in a 4K cryostat.
- Use external low-loss fiber-attachment partners for the first cryogenic packaging path.

Phase 2: Control Module Product

Mid 2027 – Mid 2028

- Tape out Tynana's first dedicated qubit controller chip.
- Develop control software for the qubit controller.
- Launch pilot engagements with superconducting-qubit teams
- Bring cryogenic optical packaging in-house

Phase 3: High-Performance TFLN Quantum-Control Platform

Mid 2028 – 2029

- Move toward TFLN photonics + InGaAs PD + cryo-CMOS for microwave-optical transducer designs for future readout and advanced quantum interconnects.
- Support 100+ qubit-control channels.

Current Pre-Seed Round & Use of Funds

Seeking $220k–250k Pre-Seed Financing to execute the Phase 1 Core Demo

01 · CURRENT ROUND

Current Pre-Seed Round

- **Target Raise:**
- $220K – $250K (Pre-Seed)
- **Instrument:**
- SAFE / Convertible Note

02 · ENGINEERING EXECUTION

Use of Funds — Phase 1 Demo

GF45SPCLO Tapeouts — $100k
- Two rounds of tapeout to de-risk the architecture
- Integrated photonic and cryo-CMOS prototype
- Fabrication, MPW participation

Cryogenic Packaging & Integration — $30k
- Fiber arrays
- Epoxy-free fiber coupling development
- Cryogenic RF PCB
- Wirebonding and assembly
- Prototype package enclosure and mechanical integration

Testing & Equipment — $70k
- Dedicated tunable laser source
- Cryostat / dilution refrigerator access fee
- Optical and RF characterization
- Measurement and system validation

Design & Simulation Infrastructure — $20k
- EDA and photonic design software licenses
- Cloud and compute resources
- Design automation and verification tools

03 · VALUE INFLECTION

Phase 1 Complete (Mid 2027)

- First working hardware demo
- Core architecture validated
- Cryogenic packaging path validated
- Pilot-ready platform

Enables customer pilots and Phase 2 product development.

Funding Amount & Timeline

A blended capital stack: targeted equity + non-dilutive grants + Silicon Catalyst in-kind

NOW · PRE-SEED

$250K

SAFE · $4–6M cap

- Two GF45 tape-outs × $125K — validate, then iterate
- 100% of cash into de-risking the silicon
- Tools, EDA & lab access leveraged via Silicon Catalyst in-kind + SBIR

PHASE 2 · SERIES A / A+

$3M

Priced round (Delaware C-corp)

- Team ~$1.5M: 3–5 cryo-CMOS / photonics engineers
- Dedicated controller chip ~$0.7M + fridge/test ~$0.5M
- First paid NRE pilots — builds the first real product

PHASE 3 · GROWTH

$15M+

Series B / strategic lead

- 100+ channel platform; TFLN / InGaAs roadmap
- Scale manufacturing + commercial design-ins
- Gated on early customer design-ins & revenue

NON-DILUTIVE ENGINE — IN PARALLEL

NSF SBIR/STTR Ph I $305K → Ph II $1.25M · **DOE / NQI** Ph I $200K → Ph II $1.1M (Labs = funder + buyer) · **NY State** ESD · FuzeHub commercialization grants

2026–2030 is the design-in window when the next decade of control systems gets bought.

PUBLIC SECTOR PRE-COMMITTED

$625M

DOE renewed five National Quantum Information Science Research Centers (Nov 2025). NIST authorized $85M/yr through FY2030. Japan committed $7.4B in 2025.

COMMERCIAL DELIVERIES STARTED

1,000+

Keysight shipped the first 1,000+ qubit commercial QCS to AIST in July 2025; Qblox and Zurich Instruments begin US/EU shipping in 2026.

GLOBAL PROCUREMENT WAVE

27.3%

Control-system market CAGR 2026–2031: ~$74M (2024) → ~$384M (2031). Translates to a $50–300M/year procurement wave through 2030.

Sources: DOE press release Nov 2025.

Leadership

Chief Executive Officer

Zhengjie Zhang

- Specialized Expertise in Privacy & High-Stakes Transactional Law: Credentialed as a Certified Information Privacy Professional (CIPP/US) with a proven operational track record in corporate law. Brings deep transactional experience to the table, including the successful structuring, execution, and management of complex, eight-figure ($13M+) commercial financing deals.
- Proven Zero-to-One Founder & Institutional Scaling: Co-founder of PBRMAX, successfully driving the company from early-stage inception to securing Series A+ institutional backing from Sequoia Capital. Combines elite legal and compliance acumen with direct, firsthand experience in aggressive startup growth, technical infrastructure development, and venture capital acquisition.

Chief Technology Officer

Bowen Liu

- Co-Founder & CTO: Spearheading Tynana's core IP and hardware development, directly leading the hybrid photonic/CMOS qubit-control architecture and cryogenic photonic/RF packaging.
- Top-Tier Academic Pedigree: Ph.D. researcher at Rensselaer Polytechnic Institute (RPI) focused on integrated photonics and quantum hardware, backed by an M.S. in Electrical Engineering from Columbia University. BS double majored in Electrical Engineering & Applied physics.
- Specialized Quantum & IC Experience: Brings highly relevant technical experience from Cornell (researching cryo-CMOS qubit-controllers) and Montage Technology (designing high-speed electronics and DDR5 memory interface circuits).

Corporate Information & Structure

Tynana Quantum LLC · formed Mar 16, 2026 (New York) · founder-controlled, institution-ready

ENTITY SNAPSHOT

Current: Tynana Quantum LLC — New York, formed Mar 16, 2026
Converting to: Delaware C-Corporation
Trigger: flip executed before the priced round, on standard VC-compatible terms

CAP TABLE & EQUITY

Founder split: Liu 70% · Zhang 30%
4-year vesting, 1-year cliff on both founders; 83(b) filed
Option pool 10–15% & advisor pool ~5% drawn primarily from the majority holder

IP CONTROL

Core architecture under **USPTO provisional 64/078,129**, licensed from Rensselaer.
In active negotiation — proposed term: **50% of net sublicensing income**, a standard university structure that leaves product & module-sale margins intact.
Pursuing an option to lock the asset.

BOARD & ADVISORS

Board: lean — 2 co-founders (Zhang, CEO · Liu, CTO); +1 lead-investor seat at the priced round
Advisors: none yet — actively recruiting (a Silicon Catalyst priority):
Analog & digital signal design · Quantum computing algorithms · Qubit hardware

Business & Go-to-Market Model

Hybrid IP-licensing + modular co-design — wedge in through funded academic & NQI groups

HOW WE MONETIZE

Control-module sales

Primary: low-power qubit controllers — recurring revenue once designed-in to a lab's stack

IP / macro-block licensing

Core photonic + cryo-CMOS control blocks licensed to integrators & semis

Control software & co-design

Calibration / control software + paid co-design (NRE) — stickiness and early cash

BEACHHEAD WEDGE

Funded academic & NQI groups — buyers, not builders

They have federal funding but no in-house RF or low-power cryogenic control depth. **Proof:** Alice & Bob (EU fault-tolerant QC) bought Quantum Machines' OPX rather than build control in-house — to focus on quantum science. We serve that same buy-not-build demand.

WHY IT STICKS — DESIGN-IN

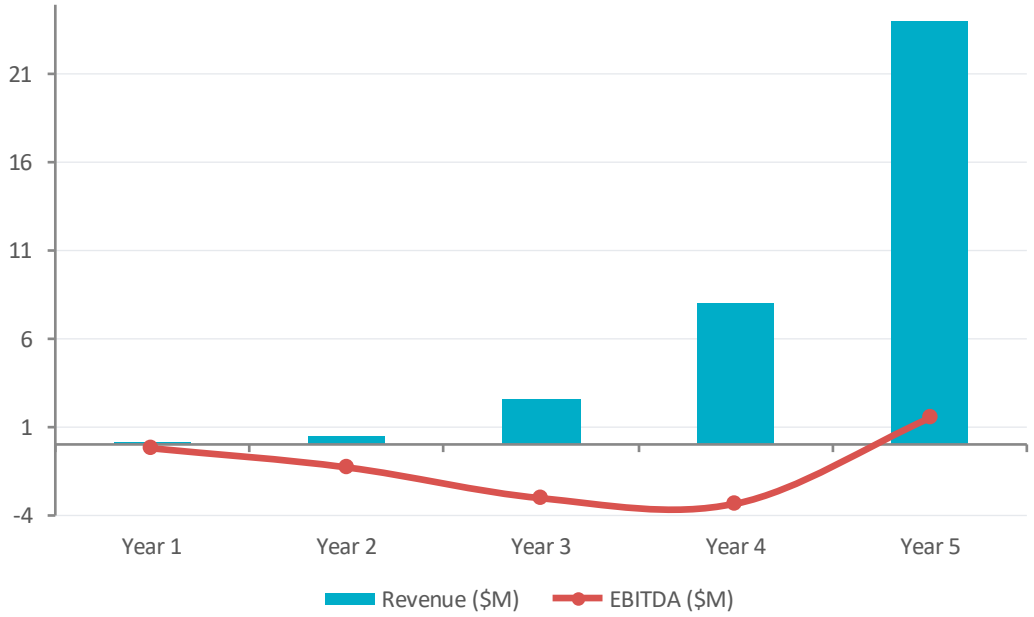
First control system into a cryostat locks in calibration + error-correction code — a 5–7 year switching cost.

PROCUREMENT REALITY

9–18 month grant-driven sales cycles · survive via SBIR/STTR Phase II–III + paid pilots · GF & AIM Photonics partnerships = fab-ready credibility, not logos

Financials — Current, 1 / 2 / 5-Year

Bottom-up & capital-efficient: Year-1 R&D heavily offset by Silicon Catalyst in-kind support



5-YEAR P&L ($M)

	Y1	Y2	Y3	Y4	Y5
Revenue	0.05	0.50	2.50	8.00	24.0
COGS	0.02	0.20	0.90	2.40	6.00
Gross %	60%	60%	64%	70%	75%
R&D / MPW*	0.20	1.20	3.50	6.00	10.0
SG&A	0.08	0.40	1.20	3.00	6.50
EBITDA	**-0.25**	**-1.30**	**-3.10**	**-3.40**	**1.50**

**Yr1 R&D offset by ~$1M+ Silicon Catalyst in-kind (EDA + GF MPW shuttles).*

$30–45K
Monthly burn (2–4 person team)

2 × $125K
Two GF45 tape-outs = the full $250K, 100% into silicon

Mid-2027
Cash-out gated to Phase-1 demo inflection

Exit Strategy

Strategic M&A in a 5–7 year horizon — the low-power control layer incumbents need

01
Keysight
Room-temp QCS; lacks native in-fridge control

02
Zurich / R&S
Expanding channel density & latency in QCCS

03
NVIDIA
Hybrid quantum-classical HPC (NVQLink); wants the control layer

04
Infineon
Industrializing quantum chips; needs the control layer

WHAT ACQUIRERS ACTUALLY BUY

Defensible IP — low-power, in-fridge qubit control that breaks the wiring & power bottleneck

Customer design-ins — pre-integrated lab relationships transfer with the deal

Scarce engineering teams — cryo-CMOS + photonics controller-design talent (acqui-hire + IP)

IPO / SPAC: *narrow & unfavorable for quantum — anchor on M&A, not public markets.*

THE ONE EXIT CONDITION

A license-from-RPI structure can veto an exit. Acquirers will not accept university change-of-control or assignment friction.

Must secure now: pre-approved assignment rights on change of control, ensuring frictionless transfer of all IP to the acquirer.