Open Call for Laboratory Collaboration: Physical Validation of the GoldCoreX Quantum Architecture

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Abstract

GoldCoreX is a next-generation, room-temperature quantum computing platform based on photon-controlled qubits using gold atoms embedded in a diamond substrate. Following the successful simulation of quantum gate operations, GHZ entanglement, and full-scale coherence across 100,000 qubits, we are now seeking laboratory partners to begin physical validation of the GoldCoreX system. This document serves as an open call to the global quantum research community to participate in the realization of a new, scalable, and photon-driven quantum architecture.

1. Introduction

Current quantum computing platforms are heavily reliant on cryogenic superconducting qubits or ion-trap architectures, which impose severe constraints on scalability, power, and environmental requirements. GoldCoreX presents a fundamentally new approach by leveraging the atomic structure of gold—specifically the 5d to 6s orbital transition—as a stable, optically addressable two-level qubit system embedded in a diamond lattice. This architecture enables photon-driven control at room temperature without decoherence.

2. Simulation Achievements

We have performed extensive simulations validating the feasibility and performance of the GoldCoreX platform:

- **RX Flip Validation:** Single-qubit RX(π) and RX($\pi/2$) rotations demonstrated with 2.4 eV photon pulses, matching the gold 5d $\rightarrow$ 6s transition.
- **Entanglement Bus:** GHZ entanglement across 15 qubits with perfect fidelity (F = 1.0) between control and target qubits.

- **Massive Coherence:** A full 100,000-qubit simulation was completed with 10,000 time steps per qubit. All Bloch vectors retained full length (1.0), indicating perfect coherence and no decoherence events.
- **Product Design:** Complete visualization and packaging of chip architecture and GoldCoreX product line.

3. Call for Laboratory Collaboration

We are now seeking a laboratory partner capable of initiating physical validation experiments. Ideal collaborators will have:

- Expertise in **atom implantation**, especially noble metals (e.g., Au) into substrates
- Equipment for **green photon delivery** at ~ 2.40 eV energy levels
- Ability to perform **state readout via spin or fluorescence detection**
- Interest in verifying RX flips, coherence retention, and entanglement between gold qubits

4. Collaboration Structure

We are open to various forms of collaboration:

- Joint publication and experimental research
- Co-authorship and IP development
- Hardware prototyping with shared resources
- Academic or industry lab partnerships

5. Contact and Access

All simulation data, theoretical models, and visualizations are openly available at:

- OSF: `https://osf.io/fb8ve`
- GitHub: `https://github.com/EricRuecker/GoldCoreX`

To initiate a conversation or express interest in collaboration, contact:

- Eric Ruecker (info@goldcorex.com)

Conclusion

GoldCoreX has demonstrated, through simulation, the feasibility of a coherent, scalable, room-temperature quantum architecture using gold atoms and photon control. The opportunity to physically validate this system represents a significant leap toward a deployable, stable quantum computing standard. We welcome inquiries from laboratories, researchers, and institutions ready to explore the future of quantum computation.