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## Seeking international collaborators for HORIZON-CL4-2025-03-DIGITAL-EMERGING-02: Quantum Computing

Collaboration Opportunity: Advancing Topological Quantum Computing and Quantum Error Correction

The research team has expertise in topological quantum systems, anyonic quantum computation, and quantum error correction (QEC). Their work focuses on the mathematical and physical principles of anyonic systems, with applications in fault-tolerant quantum computation and gauge-theoretic quantum error correction. They are seeking to join a consortium for a proposal in topological quantum computing, quantum error correction, or quantum simulations. Their goal is to leverage topological quantum error correction codes and gauge-theoretic approaches to enhance fault tolerance in quantum systems. In particular, They aim to apply machine learning methods to dynamically detect and mitigate errors, optimizing the performance of topological QEC codes.

Their contribution includes:

Developing and analyzing novel topological QEC codes that exploit gauge symmetries for enhanced error resilience.

Bridging mathematical frameworks of anyonic systems with quantum error correction, using insights from quantum gauge theories.

Implementing machine learning-based adaptive error correction to optimize fault tolerance in topological quantum computers.

Collaborating with experimental groups to realize these ideas in photonic and superconducting quantum systems.

They have a strong track record in quantum error correction, quantum simulations, and fault-tolerant quantum computation, with established collaborations in theoretical and experimental quantum information. Their expertise aligns directly with the objectives of projects on topological quantum computing and fault-tolerant quantum error correction, and they are eager to contribute to a consortium working towards these goals.

***If you want to know more contact us at [pre-award@ist-id.pt](mailto:pre-award@ist-id.pt)***