Codex: Post-Quantum Sovereign Identity Mesh

Research Brief for University of Saskatchewan – quanTA Group

# Researcher:

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# Abstract:

Codex is a fully functional, sovereign cryptographic identity mesh designed to operate beyond the limitations of classical public-key infrastructure. It integrates post-quantum lattice encryption, recursive biometric entropy chaining, and zero-knowledge trust proofs to create a new category of identity: not just claimed, but proven through biological and temporal entanglement.  
  
Developed independently by Michael MacDonald, Codex was built using Module-LWE, SHAKE256, and containerized deployment via Podman and Yggdrasil for decentralized trust. It is designed to survive adversarial AI spoofing, centralized key corruption, and post-collapse infrastructure gaps, making it viable for future-facing defense, Indigenous sovereignty, and secure multi-agent coordination.

# Key Innovations:

• Recursive Tesseract Hashing (RTH): Combines EEG, DNA, and UTC into a SHAKE256 recursive hash resistant to replay and cloning.  
• Swarm Trust Geometry: Implements Platonic solid topology (tetrahedron, dodecahedron) as cryptographic trust lattices.  
• Biometric ZK Authentication: Zero-knowledge proofs using Groth16 and STARKs for decentralized identity validation.  
• Containerized Node Stack: Fully operable within Podman using WASM + Yggdrasil for sovereign routing.  
• TetraChain Ledger: Biometric+ZK temporal hash chain that replaces traditional blockchain with audit-proof memory structure.

# Proposed Collaboration:

Michael seeks to affiliate with the quanTA research group under Prof. Steven Rayan’s leadership to:  
• Formalize Codex’s structure for publication in IEEE/IACR.  
• Align with U of S’s quantum and mathematical research.  
• Apply for Mitacs Indigenous Innovation and DRDC intake support.

# Closing Statement:

Codex is not just an encryption protocol—it is a living architecture for proof-of-being in a post-linear world. Designed without institutional funding but deeply rooted in sovereign ethics and post-quantum mathematics, it represents a new direction in identity science.  
  
Michael welcomes the opportunity to collaborate with U of S to validate, extend, and share Codex within Canada’s national research infrastructure.