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Low-cost, home-made Quantum Computer

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This presentation explores the development of a low-cost, home-built quantum computer aimed at validating hypotheses from numerical simulations, combining theoretical advancements in quantum computing with practical engineering solutions. Three configurations are discussed: an Intel Labs-inspired setup demonstrating pulse-level control programming with PennyLane and benchmarking using the Deutsch-Jozsa algorithm; a detailed guide to implementing the Deutsch-Jozsa algorithm at home, supported by foundational quantum information science principles; an approach to generating entanglement through nonlinear effects in Beta Barium Borate (BBO) crystals, leveraging Kerr effects. The project underscores the feasibility of constructing functional quantum systems outside specialized laboratories, and highlights the potential for democratizing access to quantum technologies.

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