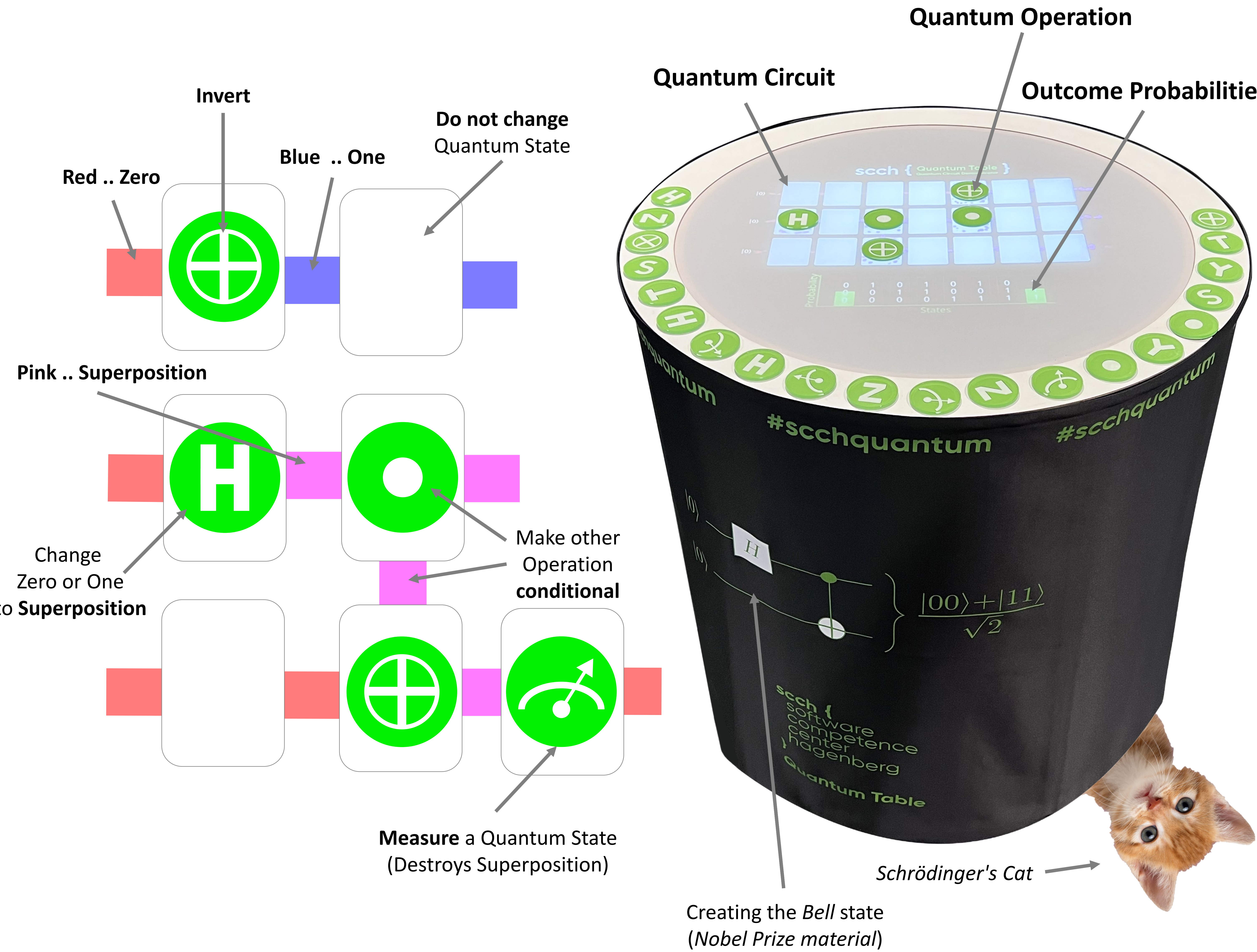# Quantum Table

## A Tangible Quantum Circuit Demonstrator

## Introduction

Quantum computing possesses considerable potential, yet its abstract nature often renders it intimidating to novices. Existing simulators, such as Quirk [1], can prove overwhelming for beginners. To address this accessibility issue, we have developed an intuitive, tangible-based simulator that integrates Reactable and ReacTIVision principles with quantum circuits. This simulator allows users to manipulate circuits through physical interaction, providing real-time visual feedback. The use of tangible user interfaces (TUIs) in complex systems has been demonstrated to simplify the user experience by allowing users to control and represent data flows through physical objects. Inspired by the Reactable's use of dynamic visual cues, our system employs similar techniques to help users understand quantum operations through direct manipulation and visual representation [2]. The integration of tangible interaction with quantum simulation is a novel approach to making quantum computing more approachable and engaging.

## Quantum Computing



**Invert**

**Red .. Zero**

**Blue .. One**

**Do not change** Quantum State

**Pink .. Superposition**

Change Zero or One to **Superposition**

Make other Operation **conditional**

**Measure** a Quantum State (Destroys Superposition)

**Quantum Circuit**

**Quantum Operation**

**Outcome Probabilities**

$$\frac{|00\rangle + |11\rangle}{\sqrt{2}}$$

Creating the *Bell* state (*Nobel Prize material*)

*Schrödinger's Cat*

## Contact

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## References

[1] "Quirk: A Quantum Circuit Simulator," Quirk, 2025. [Online]. Available: https://algassert.com/quirk. [Accessed: Feb. 18, 2025].
[2] S. Jordà, G. Geiger, M. Alonso, and M. Kaltenbrunner, *"The reacTable*: A Tangible Tabletop Musical Instrument and Collaborative Workbench," Int. Conf. on Computer Graphics and Interactive Techniques, 2007.