

No-Signaling Implies POVM Universality

A new proof reveals deep symmetry in quantum measurement

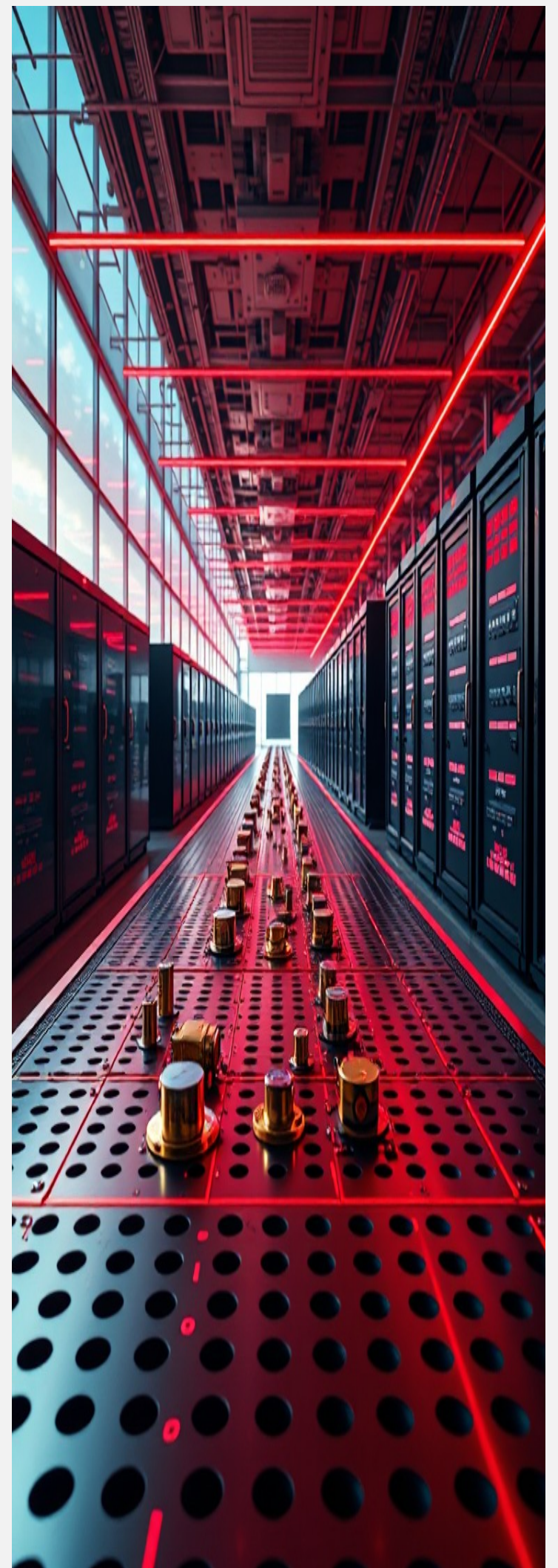
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58 pages

Paper Length

The full formal derivation spans 58 pages of rigorous quantum foundations.

This exhaustive treatment by Will Cavendish establishes that under standard NRQM assumptions, the no-signaling hypothesis is not merely compatible with POVMs—it is logically equivalent to their universality across all composite experiments. The length reflects the depth required to formalize concepts previously treated as intuitive.



01

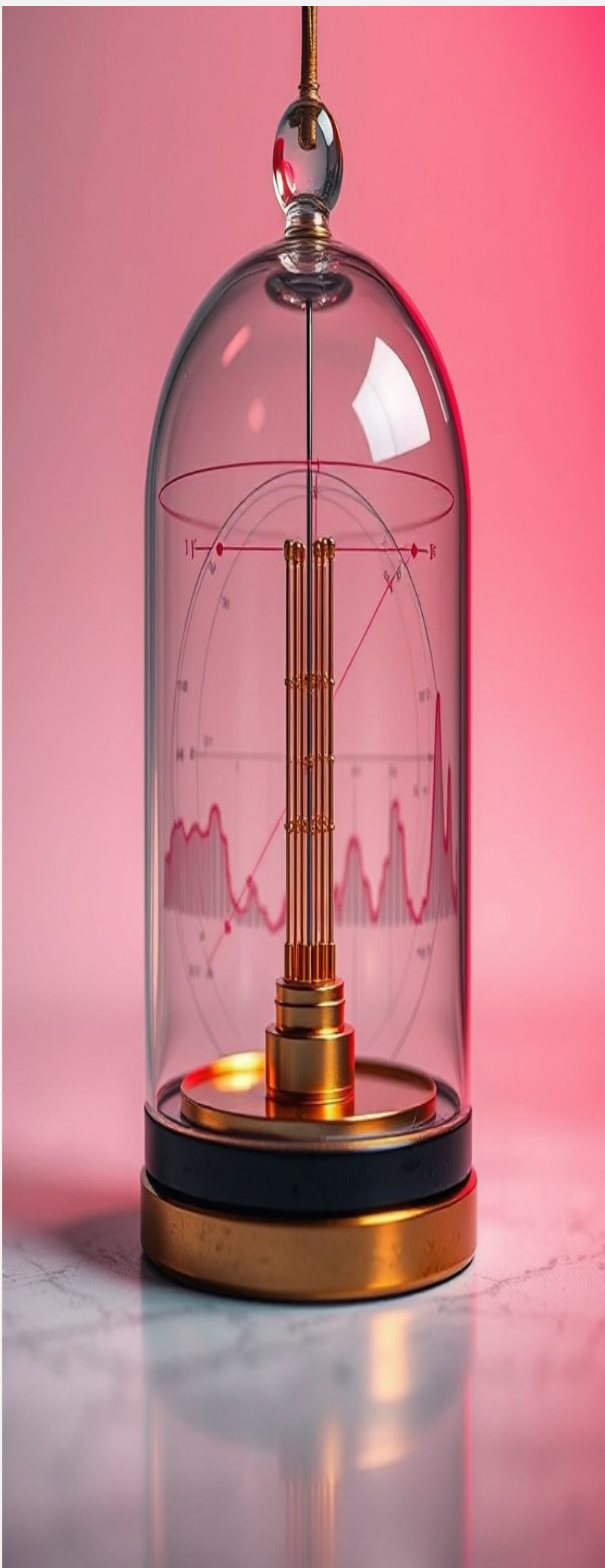
No-Signaling as a Foundational Constraint

This implies that any future theory aiming to generalize quantum mechanics must either preserve no-signaling or abandon the framework of probabilistic outcome prediction altogether—making it a gatekeeper for physical consistency.

02

POVMs Are Not Optional

This has direct implications for quantum computing: any algorithm or protocol relying on measurement must implicitly satisfy the no-signaling condition, or risk violating the logical structure of the theory itself.



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