6. Axioms of quantum theory ("mixed version")

- States are linear operators ρ with

$$\rho \geq 0$$

$$\mathrm{tr}(\rho) = 1.$$

- Evolutions are completely positive trace preserving (CPTP) maps

$$\mathcal{E}(\rho) = \sum M_n \rho M_n^\dagger \,, \quad \sum M_n^\dagger M_n = I.$$

- Measurements act as

$$\rho \longmapsto \rho_n = \frac{M_n \rho M_n^\dagger}{\mathrm{tr}(M_n \rho M_n^\dagger)} \,,$$

with probability $p_n = \mathrm{tr}\left(M_n^\dagger M_n \rho\right)$,

where $\sum M_n^\dagger M_n = I.$