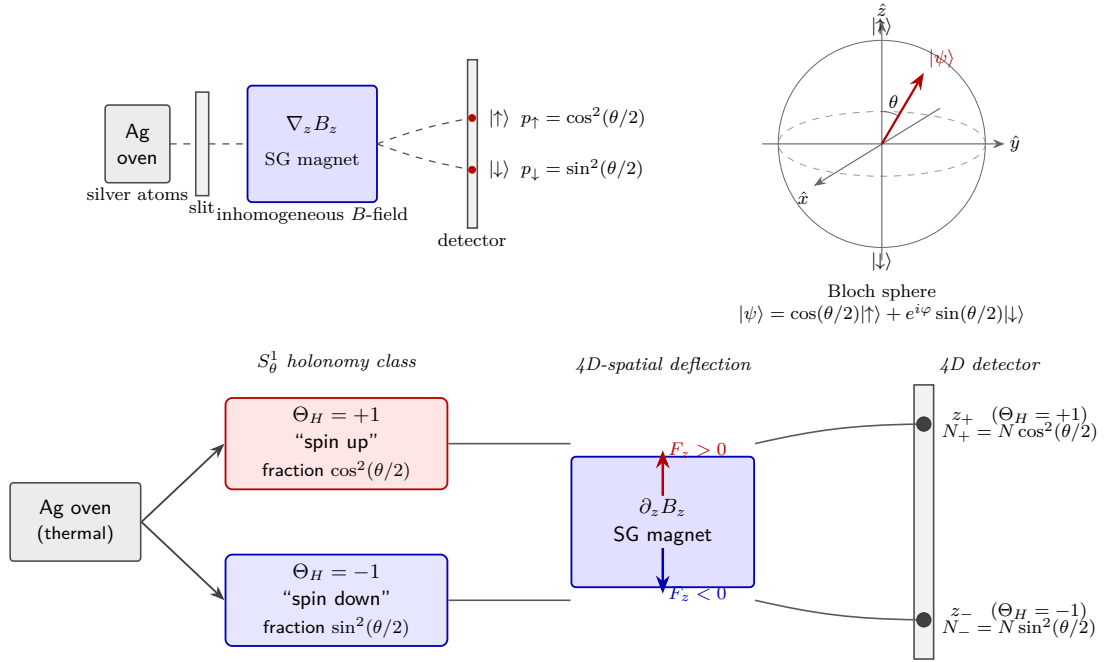


No Atom Ever Feels a Probability — the Randomness Is What the Observer Cannot Read



Each silver atom is in one discrete holonomy class of the 6D gauge bundle. The B-field gradient discriminates the two classes by 4D force; each atom lands on one spot; the histogram of N atoms reproduces the Born-rule weighting $\cos^2(\theta/2) : \sin^2(\theta/2)$ from the source population.

The oldest quantum measurement, run twice. Above: the 1922 apparatus as everyone teaches it — silver atoms out of an oven, through an inhomogeneous field, into two discrete spots — with the Bloch-sphere reading of the input qubit and the Born-rule populations $\cos^2(\theta/2)$ and $\sin^2(\theta/2)$ beside it. Below: the same experiment read on the bulk. The heated source populates two discrete holonomy classes of the gauge bundle around the phase circle, in exactly that ratio; the field gradient pushes the two classes apart in four-dimensional space; each atom lands on one spot, z_+ or z_- , according to which class it was in. *No single atom experiences probability.* The randomness a laboratory reports is the four-dimensional observer's inability to read the phase holonomy directly, and the textbook "pure state" is the 4D shadow of the source ensemble. In full: Figures 6 and 7, pp. 127 and 131.