

3 Postulates of quantum mechanics

- $|\psi\rangle$, the “ket” *completely describes the system*. The “ket” resides in some linear vector space, which we may depict as V .
- A measurable quantity is described mathematically through an operator, say \mathcal{A} . The measurement is fully described by the action of the operator \mathcal{A} on a complete set of elements in V . The expectation value of such a measurement is given by the bra-ket $\langle\psi|\mathcal{A}|\psi\rangle$, which is known as the expectation value of \mathcal{A} with respect to $|\psi\rangle$.
- Any given measurement can only result in one of the eigenstates of the operator \mathcal{A} .
- The probability of the measurement yielding the eigenstate $|a_n\rangle$ of \mathcal{A} is $|\langle a_n|\psi\rangle|^2$.

Homework: As stated in class, justify the stated postulates through your knowledge of the Stern-Gerlach experiments.