2026.6 | QM 2 and Probability

2026-06-11 – 2026-07-05

1: Weekly Learning

- Course study:
  MITOCW 8.05 Quantum Physics II
  Harvard SATA 110:
- Learn the basic theory of quantum computation

2: Weekly Highlights

- Systematically studied the fundamentals of probability theory and random variables, including counting methods, conditional probability, Bayes' theorem, the law of total probability, and independence. Applied these concepts to classic examples such as the birthday problem and the Monty Hall problem. Also studied PMFs, PDFs, CDFs, expectation, variance, common probability distributions, and the basics of joint, marginal, and conditional distributions.
- Studied key topics in quantum mechanics, including the Schrödinger equation, Hilbert spaces, operator formalism, quantum dynamics, two-level systems, tensor products, quantum entanglement, Bell inequalities, quantum teleportation, and angular momentum. Strengthened my understanding through mathematical derivations and a simple visualization of stationary-state evolution.

3: Insights & Takeaways

- Quantum Physics II helped me connect mathematical formalism with physical ideas such as quantum measurement, state evolution, and superposition.
- Probability theory showed me that clearly identifying assumptions and available information is often more important than applying formulas directly.
- These courses strengthened my interest in quantum photonics while showing me that I still need more practice turning theoretical knowledge into computational models.

4: Challenges & Open Questions

- need more practice connecting abstract mathematical formalism with physical intuition, particularly in unitary evolution, tensor products, and angular momentum.

5: Following Plan

- Continue studying Solid State Physics
- Begin reading introductory papers and review articles