1 Hello Video

Turn on Canvas, not Gradescope Welcome to the class!

We'd like to get to know you a bit, so please make a short video (2 min max) introducing yourself and post it to Canvas.

You may use any video-making technology you want (Kaltura is a straightforward option).

Your video should include the following information:

(a) The correct pronunciation of your full name

(b) The name you'd like to go by in class.

(c) Your pronouns

(d) A fun fact about you

(e) Anything you'd like us to know about you. (If there is something private you want to share, you can stop by Doris or Liz's office or email one or both of them.)

2 Stern Gerlach Explain

Turn in on Gradescope

(a) Use words and equations to explain the key features of the Stern-Gerlach experiment.

(b) *Contrast Classical/Quantum* Explain what you would predict based only on classical physics for the Stern-Gerlach experiment and describe the difference between the classical prediction and the actual experimental results.

3 Spin Fermi Estimate

Turn in on Gradescope The following two problems ask you to make Fermi estimates. In a good Fermi estimate, you start from basic scientific facts you already know or quantities that you can reasonably estimate based on your life experiences and then reason your way to estimate a quantity that you would not be able guess. You may look up useful conversion factors or constants. Use words, pictures, and equations to explain your reasoning:

(a) Imagine that you send a pea-sized bead of silver through a Stern-Gerlach device oriented to measure the z-component of intrinsic spin. Estimate the total z-component of the intrinsic spin of the ball you would measure in the HIGHLY improbable case that every atom is spin up.

(b) Protons, neutrons, and electrons are all spin-1/2 particles. Give a (very crude) order of magnitude estimate of the number of these particles in your body.