Lab 4: Diffusion + drift

Team info

Lab section: C01 (12-3 PM) | C02 (3-6 PM)

Table number: \_\_\_\_\_\_\_\_\_\_\_

Team name: \_\_\_\_\_\_\_\_\_\_\_

Journalist: \_\_\_\_\_\_\_\_\_\_\_

Data Interpreter: \_\_\_\_\_\_\_\_\_\_\_

Critic: \_\_\_\_\_\_\_\_\_\_\_

Checker: \_\_\_\_\_\_\_\_\_\_\_

[This is a shell of a blank writeup. Strip out the verbiage, including this sentence, and replace it with your own.]

# Journal

This corresponds roughly to Materials and Methods in a scientific paper. It won’t have all the technical detail of an academic paper (for instance, you don’t need to report what kind of microscope you used), but it should have enough information that *the reader can understand exactly what you did and how you did it*. It is particularly important to explain any deviations from the lab instructions, or anything not explicit in the lab instructions.

*For instance, this week* you would probably swiftly recap the instruction and also tell us about some details that vary from group to group, such as how you calculated the tilt of the microscope. At some point (perhaps here; perhaps in another section below) you should calculate the expected drift velocity of beads on a microscope with a tilt angle.

# Data and Interpretation

Your findings, displayed in an easy-to-understand form, with the important features explicitly described and explained.

We are mostly concerned that you display your data to us in a comprehensible and elegant way. *You* can decide exactly how to do so, but we often offer hints or suggestions.

*This week, for instance*, you should probably include

1. Plots of the mean and mean-square displacement as a function of time, in x and y.
2. Report the diffusion coefficient and/or drift speed from the fit lines above

# Evaluation

Deeper reflection on what your results mean. Do they make sense? Are they consistent with other things you know?

*This week, for instance*, you might comment on

1. Are your mean and mean-square graphs the right shape for what you expect from Brownian motion? From Brownian motion with an additional drift on top?
2. Is the diffusion coefficient consistent with the Stokes-Einstein prediction for D?
3. Is the drift velocity consistent with the tilt of your microscope and the viscosity of water and weight of the beads?

**Make sure you answer all the questions from the lab page somewhere in your writeup!**