

# Physics 2211 – IPLS flavor

# Lab report

The lab report contains three sections:

## Journal

This corresponds roughly to Materials and Methods in a scientific paper. A description of what you did, detailed enough that a third party could reconstruct (or replicate) your experiments.

## Data and Interpretation

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

## Evaluation

Deeper reflection on what your results mean. Do they make sense? Are they consistent with other things you know? How could the lab have been improved?

**NOT THIS WEEK**

# Teams

Lab teams will be composed of 3-4 randomly chosen people.

Team composition is fixed for the semester.

We hope you will like each other. Whether you do or don't, you must treat each other politely and respectfully. This is good practice for your future work life.

Roles within the team rotate from lab to lab:

## Journalist

Takes notes of everything that happens during the experiment. Writes the "Journal" section of the lab report.

## Data Interpreter

Tabulates and displays data, operates the computer. Writes the "Data and Interpretation" section of the lab report.

## Critic

Performs outside research (if required), and thinks critically about the structure of the experiment. Writes the "Evaluation" section of the lab report.

## Checker

Checks all sections of the lab report for legibility and consistency. Acts as a project manager for the lab. In a group of three, the role of checker is shared by all group members.

# Computers and computer programs

## Video acquisition

Phone, OS, webcam software, or AmscopeX (proprietary to our microscope)

## Video transcoding

OS, VLC, online services or Adobe Premiere

## Extracting data from video

ImageJ (aka Fiji)

## Mathematical manipulation of data

Excel, MATLAB or python.

## Graphical representation of data

Excel (barely), MATLAB or python.

## Report preparation

Word or Word clone, or a real typesetting language (LaTeX)

I highly encourage you to bring your own computer with these tools installed and ready to use.

Lab computers are sluggish, cannot be configured, and **delete data frequently**.

# This week's lab

## Definition of acceleration

For software help, flag us down and/or refer to technical guides on our course website.

## Writeup

Start from the Word document on the course website as your cover page.

Don't worry about team roles. Do record your names.

Don't bother with the three sections this week.

Additional question: which velocity did you calculate and plot?

Instantaneous velocity? Average velocity?

Hint: I don't think there's a one-word answer to this

# For next week

Do the pre-lab reading and readiness assessment quiz

Will be posted on WebAssign asap.

Bring your laptop, with functioning software for

1. Extracting data from video
  - ImageJ
2. Mathematical manipulation of data
  - Excel, MATLAB, ...
3. Graphical display of data
  - Excel, MATLAB, ...
4. Presentation and publication of data to PDF format
  - Word, Google docs, ...