Keeping a Professional Scientific Notebook

As discussed briefly below, a professional scientific notebook serves several purposes. We want to set you off on the right foot so we will follow some of the relevant practices but we will not be as rigid with how you keep your lab notebook as will be the case in Lab II (PHY4803L). Your laboratory notebook is principally a (critical) memory aid for you.

You might, for example, be doing an experiment that requires recording a current (to several decimal places) as you adjust a voltage over some set range of values. You won't be able to remember all the numbers so you will need to set up a table in your notebook in which the first column is the voltages you apply, and the second column is the corresponding currents you measure and record. Later on the experiment calls for a modification to the circuit and a repeat of these measurements, which you do in a second table. But dang…, only after that is done do you realize that your first circuit was flawed in some way, so you repeat the first set of measurements in the corrected circuit.

Two weeks later you have to write up these results in a report and now, long after you've forgotten the details of what precisely you did, you flip back through your notebook to be confronted by three tables, but without any other information! Which table belongs to which version of the circuit? Which one was wrong and had to be repeated? You see the point. What you should have done is made a sketch of each circuit to associate with each table and then made a notation that the first circuit and its associated table was wrong.

For those of you with OCD (to which many in our line of work are prone), you will be tempted to write your notebooks in pencil or use a loose leaf folder so you can erase or tear out the offending table. Don't do this! You should use a notebook with bound, numbered pages, you should write in pen, with corrections clearly indicated, but with the original still legible, and your first entry on any day should be dated. There are several reasons to get used to this. First and foremost, a popular meme today is 'pics or it didn't happen', similarly in professional work, it's 'notes or it didn't happen'. Just as a blurry or poorly framed picture tells you little about what went on, your notes need to be neat enough to let you reconstruct the events and give you confidence in the data (often in the face of contradictory or confounding results). Beyond that, your properly kept notebook provides documentation that this is work that ***you*** did and when you did it. This from the perspective of plagiarism or priority.

As life would have it, you are likely at some point in your career to have a co-worker try to claim credit for your work. A properly kept notebook will provide your first line of defense that it was, in fact, your work. Priority relates to any potentially valuable intellectual property (think patents) that comes from your work and your ability to claim being the first to think of and recognize its significance in a way that makes it valuable. Realize that your notebook may become a legal document in a dispute.

General tips for a properly kept research notebook:

- Use a notebook having bound numbered pages (quad ruled preferred).
- Identify the notebook as yours with your name and contact info (to return if lost).
- Date the start of work on any new day.
- Date and start any new work on a new page.
- Include descriptive text about what you did and its immediate motivation.
- Label tables and graph axes.

- Don’t erase or tear out pages. Strike out an incorrect result with a single line leaving it legible.
- Printed or photocopied sections can be taped in. Date and initial across the edge of the tape.

Many organizations have gone to some sort of software-based notebooks, where some of these features are automated and electronically recorded data can be automatically entered. That’s all well and good when the budget exists for an IT person/department to oversee the security and back-up for safe storage of the information contained. But the reality is that for individuals and small organizations it is still hard to beat the safety and security afforded by paper. Consider that the Gutenberg bible is still easily readable after its estimated printing 559 years ago. In contrast, you would be hard pressed to find a tape drive to read tape storage from only 30 years ago. Software changes even more rapidly.