How to write a decent lab report

Lab 0 grades

- Top grade is a B- (~80%), before late-penalty is applied
- Remaining grades are C+ to D

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- You can do better than this!

No fluff!

- Write your report like a scientific paper.
- Every sentence has to be precise and meaningful.
- Write good English.
- Make sure to understand your analysis. It's obvious when you don't, and we will take points off.
- Your paper has to contain all of the information necessary to reproduce your analysis and your results.
- Be concise!
- If you find yourself repeating sentences, consider making a table.

- Read scientific papers to learn how to write one!

Abstract, introduction, and conclusions

- The majority of “readers” only read the abstract. Make sure it gets the point across!

- Most of the remaining readers read the abstract, the introduction, and the conclusions. Make sure they get a good understanding of the subject, and of your results!

- The people who read the entire paper are interested in the details of your analysis. Don’t disappoint them!

Abstract

- The abstract contains a summary of the paper.
- It does not contain:
  - A lengthy introduction to the problem
  - Sentences like “the aim was to learn about CCDs”
  - Anything that is not contained in the main body of the paper
- It does contain:
  - A brief description of your observations
  - Your results!

- Hint: write the abstract last!

Introduction

- Serves as a review of the subject of the paper
- Needs to discuss and cite the appropriate literature

Conclusion

- Serves as summary of the analysis
- Emphasis is on the results and their interpretation, and how they relate to results in the literature
- Can provide an outlook, e.g. how the measurement can be improved with future measurements

In-between

- Make sure that there is a “red thread” in your paper
- Do not artificially sub-divide your analysis
- You might have to break the Data Reduction / Data Analysis and Results / Discussion pattern - come check with us when in doubt

Figures

- Make sure your figures are legible when printed out
- Make sure your figures contain information (a black box saying “this is a dark frame” does not contain any information)
- Make sure the figure caption describes the figure adequately
- A figure is not the place to report your results (results can be in the figure or caption, but have to be discussed in the text)

Results

- Make sure to quote the appropriate uncertainties!
- Even qualitative results need “proof”:
  - Example: when you say “this distribution is consistent with a Gaussian”, you have to say how you came to this conclusion. E.g. by overplotting the best-fit Gaussian.
- Compare your results to the expected values. For Lab 0 : read noise, gain, dark current are all documented.
- If your results deviate significantly from the expectation, you have to discuss possible reasons. Possible reasons have to be specific. “There is extra noise in the data” is not sufficient.

We’re here to help!

- If you have questions, including on writing the report, come ask us
- We much prefer to discuss beforehand than read bad reports

- Within your group: proof-read your reports

Late policy

- For every day that your report is submitted late, your grade will be multiplied by a factor of 0.95
- Grade = (initial grade) x (0.95)^(N days late)
- Example:
  - Initial grade of 80%
  - One day late: 0.80 x 0.95 = 0.76
  - Two days late: 0.80 x 0.95^2 = 0.72
  - Three days late: 0.80 x 0.95^3 = 0.69
  - One week late: 0.80 x 0.95^7 = 0.56
  - Two weeks late: 0.80 x 0.95^14 = 0.39
- Take-away: if you can substantially improve your lab report in one extra day, it's probably worth it. Much longer: need to write a fantastic report in order not to fail.

Weekly check-ins

- The weekly deadlines are meant to help your time management to submit the reports on time.
- It is also a great time to ask questions about your analysis and reports!

- Missing a check-in is another factor of (0.95).

We’re here to help!

- If you have questions about your analysis etc., don’t hesitate to ask the TAs or me - we would rather discuss with you beforehand than read bad lab reports

- Best time / place to ask questions: the data analysis help sessions
- The help sessions also give us the opportunity to ask you questions to make sure you are on the right track

“My grade on Lab 0 is really low…”

FOR LAB 0 ONLY:

- You can get up to 10% back by re-writing the abstract and the conclusions.
- Deadline: Oct. 25
- (Not an option if you haven’t handed in your Lab 0 report yet.)