Distance and Brightness
Lab #2

Objectives: To acquaint ourselves with:

- how distance affects the brightness of objects,
- the camera and the software,
- measurements and uncertainties.

Category: Guided Investigation. Work in groups.

Investigation: Brightness vs. Distance

Investigate how the brightness of a light bulb varies as a function of its distance to the observer. Use the camera to take pictures of that object at various distances, and use the software to measure its brightness. Always try to think, also, about the precision of your measurements.

Then make a plot of your measured brightness as a function of the light bulb’s distance. Also make a log-log plot of those two quantities. That is, plot the logarithm of brightness vs the logarithm of distance. Do not connect your points. Instead, try to draw a “best-fit” line that would run as close as possible through all your data points. You can just do this by eye.

You can now infer a mathematical relation between brightness and distance. Evaluate how much uncertainty you have on the parameters of this relation.

Conclusions

- Did this lab help you attain the objectives mentioned above? If yes, how so? If no, why?
- Which parts of the lab were helpful to your understanding, and which ones were rather confusing? How so?