

# Physics 112: Diffraction Lab

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**Purpose:** To observe how the diffraction pattern depends on wavelength and distance between the diffraction grating slits. The wavelength of red and green lasers will be determined. The line spacing of a CD and DVD will be calculated.

**\*\*\*These laser can damage your eyes! Do not point them at people even if they are off!\*\*\***

**Materials:** Red and green laser pointer, metre stick, known diffraction gratings, DVD, CD, and Blu-Ray

**Part I:** Determining the wavelength of the red and green lasers.

- I. Setup the diffraction grating and record its distance to the wall and how many lines per inch on the grating.
- II. Tape/secure your blank paper on the wall. Ensure that it is not too far from your grating (you should see the middle dot and at least three dots on one side. This paper is to be included in your report so label it correctly (all parts of the lab should be on one piece of paper).
- III. Shine the laser through the grating and trace the pattern on the paper.
- IV. Measure the distance from the centre dot to the first, second, and third dots on the right (or left).
- V. Replace the diffraction grating with a different one and repeat steps I through IV.
- VI. Record your numbers on the Excel file called Diffraction Lab Results (be sure to save it as a different name).

**Part II:** Determine the spacing between CD, DVD, and Blu-Ray tracks. (we will use factory wavelength values)

- I. Set up the apparatus such that you will shine a red laser through the CD.
- II. Shine the laser and trace the pattern (should see a middle dot and one dot to the right and left).
- III. Repeat with the green laser.
- IV. Repeat for the DVD and Blu-Ray disc.

## Discussion/Conclusion

- Remember to restate the purpose of the lab.
- Be sure to include a summary of your findings and sources of error.
- Did you successfully determine the wavelength of the laser to within factory value?
- Write a few sentences concluding the lab report.
  - a) Why are your findings for part II important for recording data on discs?
- I will print your data table for you or you can copy it into your lab book.