

Quantum Physics, Preparation for Tuesday, Jan. 23

Study Q3.1 to Q3.5 from *Six Ideas*

Q3.6 is cool but quite advanced. It is how you apply some of these ideas to circular lenses instead of slits. Just as we noted for the advanced material on resonance in Section Q2.4, it isn't critical for our quantum mechanics studies, and you are free to skip it.

Presentations

Ethan (with Hexi and Miles if out of quarantine): Presentation of a Python program that does the in-class exercise from the last class

Brian: Mathematics of Section Q3.5

Emma: Applications of Section Q3.6 to laboratory instruments used in the cloning class

Brian (looking ahead to Q4.1): Light is a Wave and The Electromagnetic Spectrum

Someone else: Would someone (or some small group) like to give a historical introduction to the material in Section Q4.2? A variety of questions could be researched (not all!). What is Planck's constant? What is the "ultraviolet catastrophe?" What did one of the original photoelectric effect apparatuses look like? Can we look at a copy of one of the papers (perhaps in translation) mentioned in Q4.2?

For Problem Set 3

Some Basic Problems with Single and Double Slits

1. Q3B.4 A double-slit problem
2. Q3B.12 A single-slit problem, where the slit is narrow, but not so narrow that its width is negligible
3. Q3M.2 Another two-source problem, except the two sources are antennas. First draw a top view of the situation that is consistent with the problem description.

A Challenging, Multi-Part Problem

4. Q3D.4 The intensity pattern of a wide slit (Rebecca asked how the wide slit can be understood)