

What to expect: Color I

In the last two weeks we considered phenomena arising when considering light as light rays. That means we considered Geometrical Optics.

Now it is time to go a step further and put the wave nature of light into the mix. That means, now we consider Wave Optics. Phenomena requiring us to understand Wave Optics occur, when light encounters material obstacles that are of roughly the same size as the wavelength of light.

When light hits small, isolated objects, for example sunlight hits dust molecules in the atmosphere, then we have to consider scattering of that light. This scattering of light is responsible for many of the colors we see in nature.

We also already learned that light is an electromagnetic wave, and that electromagnetic waves are the result of "wiggling charges". We have not explicitly considered the if the direction in which those charges wiggle is important. It turns out that it is, and this phenomenon is responsible for the polarization of light. You most likely have heard about polarized sun glasses, and know that they are better than ordinary sun glasses when e.g. going for you ski vacation. In this week we want to ask why are they better.

We also want to learn about another phenomenon special to waves, interference. You most likely experienced that water waves can interfere and thus create a new patterns of the waves. Since you learned that light is a wave, you should now expect that there must be interference phenomena related to light. You will study this during this week.