

Lab 5 Thermal Radiation Intensity Tasks

Lab report due next Saturday 5pm

Read Ch. 2, sections 2.1-5 in your Lyons text (pp 44-54)

Equipment note: Please take care when you are done with the experiment to leave space around the oven for it to cool down (we don't want any fires). An hour after you are done with the experiment return to the room to unplug the oven.

Stabilize the temperature of a furnace at at least 5 different temperatures, and measure the voltage the electromagnetic radiation from the furnace produces in a thermopile. Given that the thermopile voltage is proportional to the radiation intensity (possibly with some constant offset) use a logarithmic plot to find the best exponent n for a power-law approximation relating radiation intensity I to the temperature T in Kelvin: $I(T) = AT^n$.

This is the first experiment that you've done where you have not studied any theory that would predict this exponent. This is good as it is a common situation in experimental physics. However, it does mean that you should take special care to try and understand the uncertainties in your measurements.