Station Card: Blackbody Radiation

Temperature sets a star's spectrum and color

Dr. Anna Rosen

Name: _____ **Section:** _____
Date: _____

Station: _____ **Group members:** _____

Goal: Use the demo to make a claim supported by (1) at least one number/readout and (2) at least one sanity check.

Demo: `/demos/blackbody-radiation/`

Pick one preset (**Sun**, **Red Giant**, **B**, or **White Dwarf**) and record: - Temperature T (K) - Peak wavelength λ_{peak} (nm or µm) - Which band dominates (IR / visible / UV)

Then write one sentence: > "This star looks _____ because its blackbody peak is at _____."

Word bank + sanity checks

Word bank: - **Blackbody spectrum:** the ideal "thermal glow" curve; temperature sets its shape. - **Temperature T (K):** hotter objects emit more and peak at shorter wavelengths. - **Peak wavelength λ_{peak}:** where the curve is highest (the "peak marker"). **Key relationship (Wien scaling):**

$$\lambda_{\text{peak}} \propto \frac{1}{T}$$

Sanity checks: - Hotter $\rightarrow$ λ_{peak} shifts to *shorter* wavelength (toward blue/UV). - Cooler $\rightarrow$ λ_{peak} shifts to *longer* wavelength (toward red/IR). - In astronomy, "redder" blackbodies are **cooler**, not hotter.