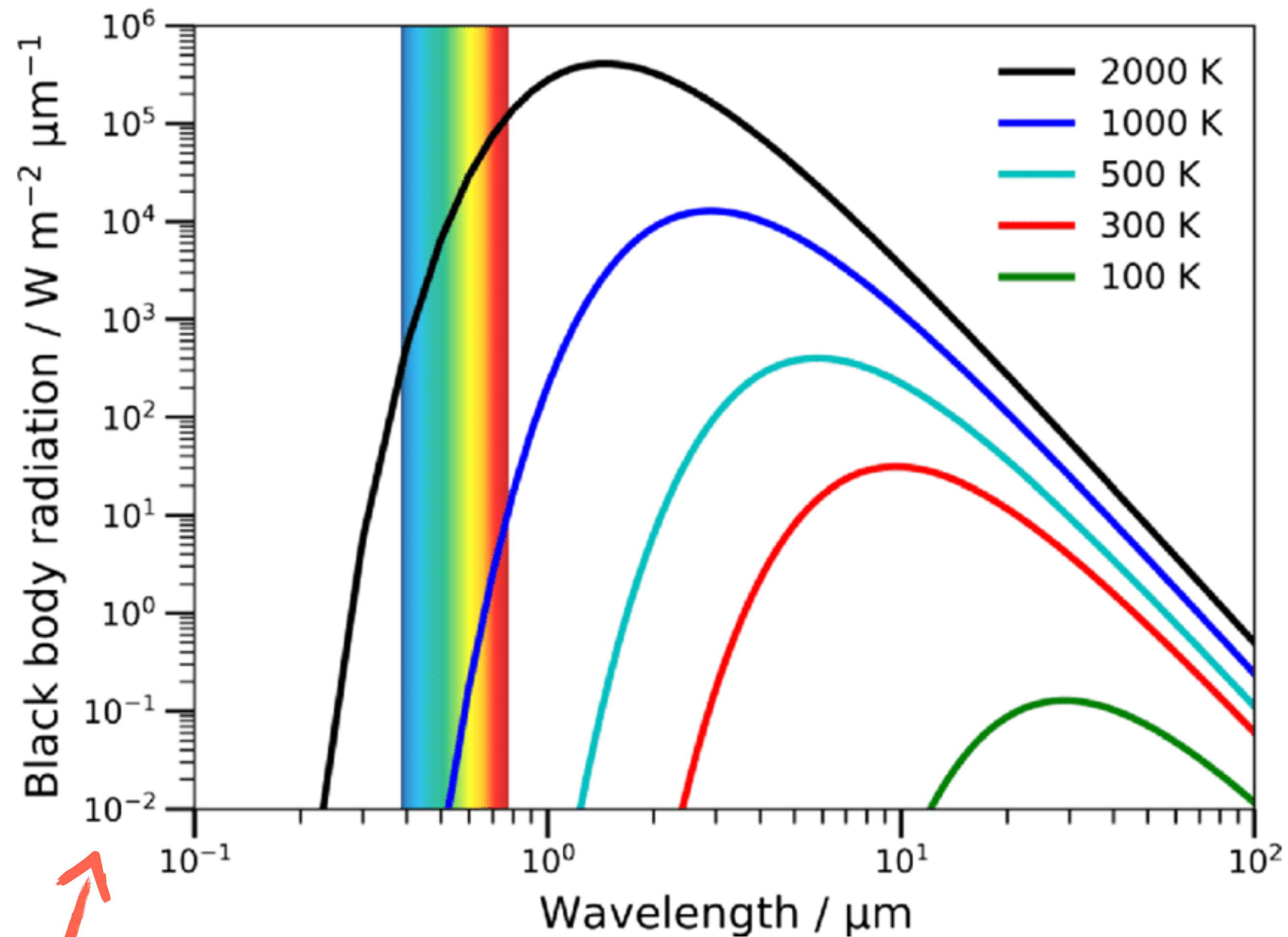


# **Alcuni spettri esemplificativi**

**Laboratorio di Fisica della Materia Condensata, a.a. 2023/24**

**Francesco Scazza - 11 Ottobre 2023**

# Black-body radiation



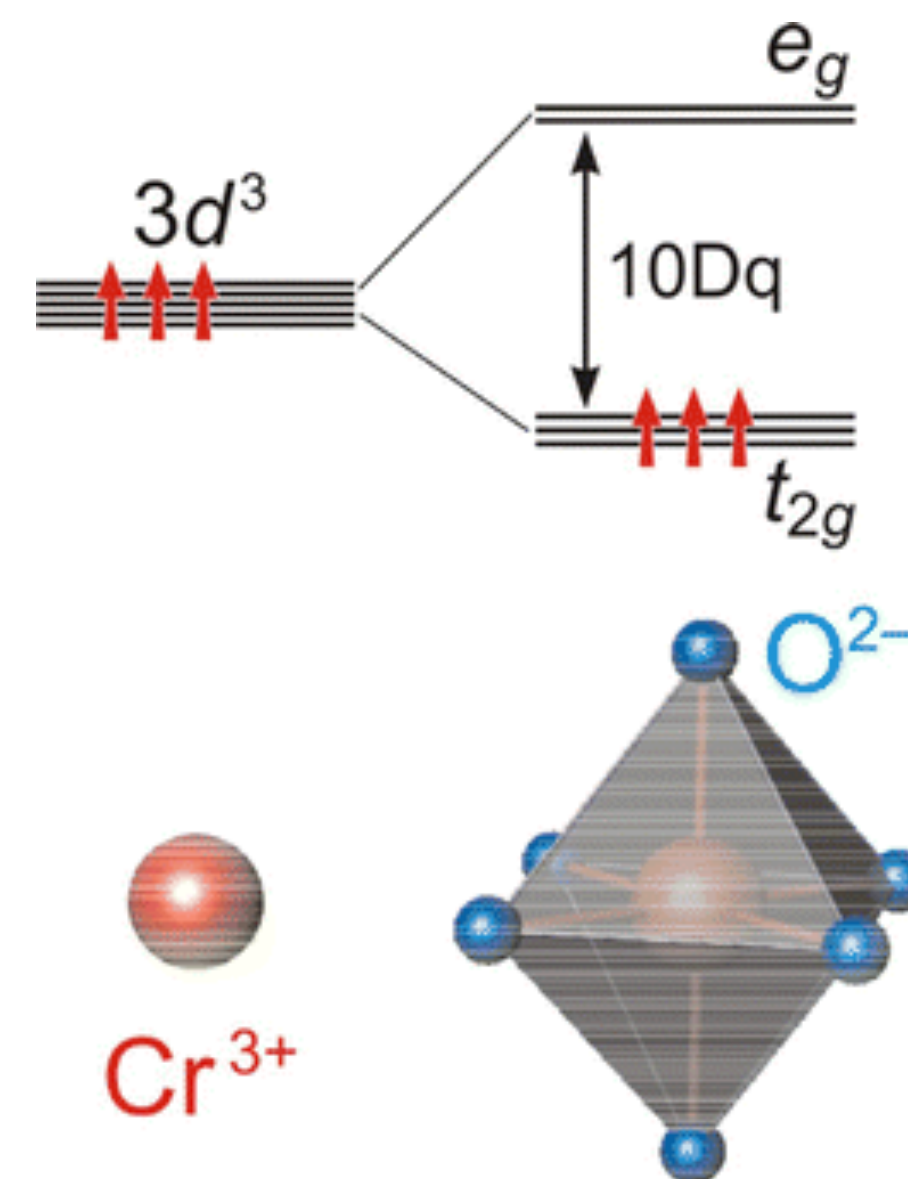
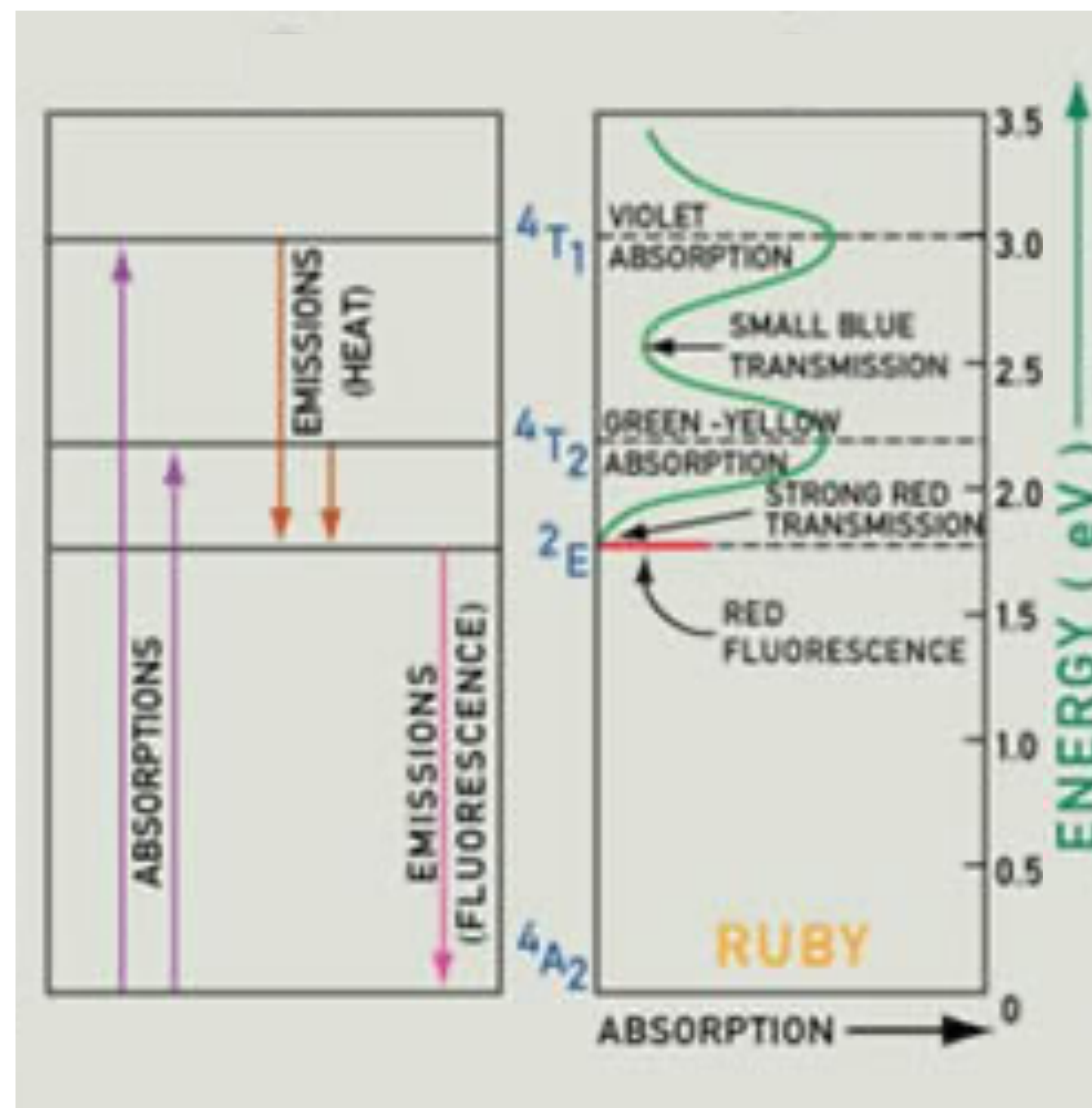
\* Planck's formula for the spectral radiance:

$$B_{\nu}(T) = \frac{2h\nu^3}{c^2} \frac{1}{e^{h\nu/kT} - 1}$$

↑  
Log scale

# Ruby

- \* Ruby is a  $\text{Al}_2\text{O}_3$  crystal containing  $\text{Cr}^{3+}$  ions: the chromium ion is a substitutional impurity (replacing the aluminum ion  $\text{Al}^{3+}$ )
- \* The  $\text{Cr}^{3+}$  concentration is about 0.05%, but dominates the response to light in the visible region



- \* Chromium has a  $(3d)^3$  outer-shell configuration with five empty  $d$ -orbitals. The color results from inter-level transitions between different chromium  $d$  orbitals.

# Ruby fluorescence

