

651-4911-00: Office hours

Bettina Meyer: Tuesdays 10-11h
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Michael Byrne: Thursdays 15-16h
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But not 8/10/15!



Homework 1

- Due October 7th (~10 days)
- Questions so far?

Phenomena

Questions about winds, temperature, water cycle, humidity...?

Radiation terminology

Solar luminosity, L : Total amount of radiative energy emitted by the Sun per unit time [W]

Irradiance (or radiative energy flux density), S :
Radiative energy passing per unit time through each unit area of a sphere at a distance d from the Sun [W/m²]

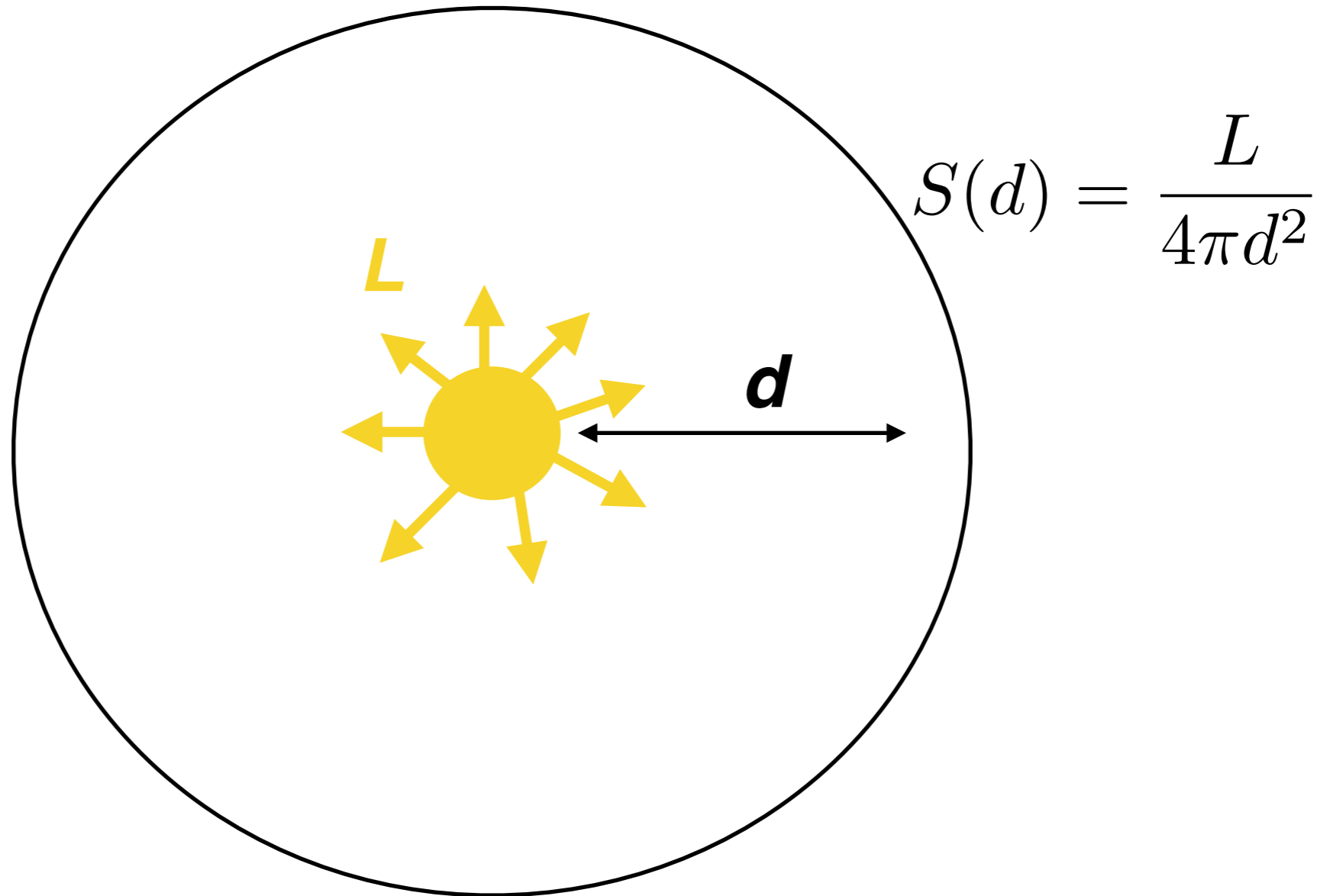
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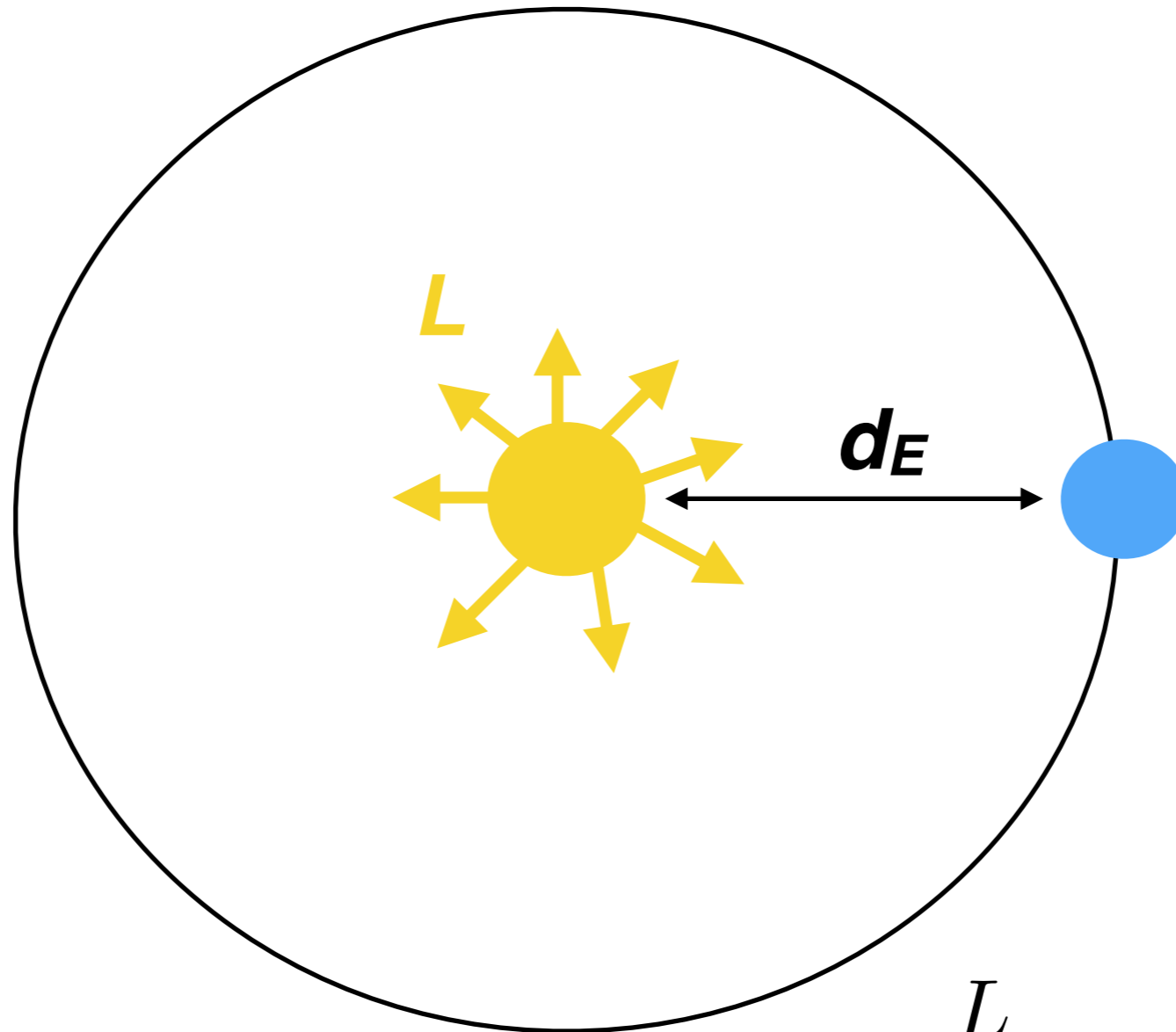
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inverse square law $\longrightarrow S = \frac{L}{4\pi d^2}$

Radiation terminology



Radiation terminology



Solar “constant”:

$$S_0 = \frac{L}{4\pi d_E^2} \approx 1362 \text{ W/m}^2$$

Planck's Law

- Radiative energy emitted by Sun/Earth is a function of wavelength
- Describes the radiative energy emitted by a blackbody as a function of frequency/wavelength and temperature
- Derived by assuming that EM radiation is quantized, then use rules of statistical mechanics

$$B_{\lambda}(T) = \frac{2hc^2}{\lambda^5} \frac{1}{e^{\frac{hc}{\lambda kT}} - 1}.$$