GEOSOLAR ENGINEERING

by

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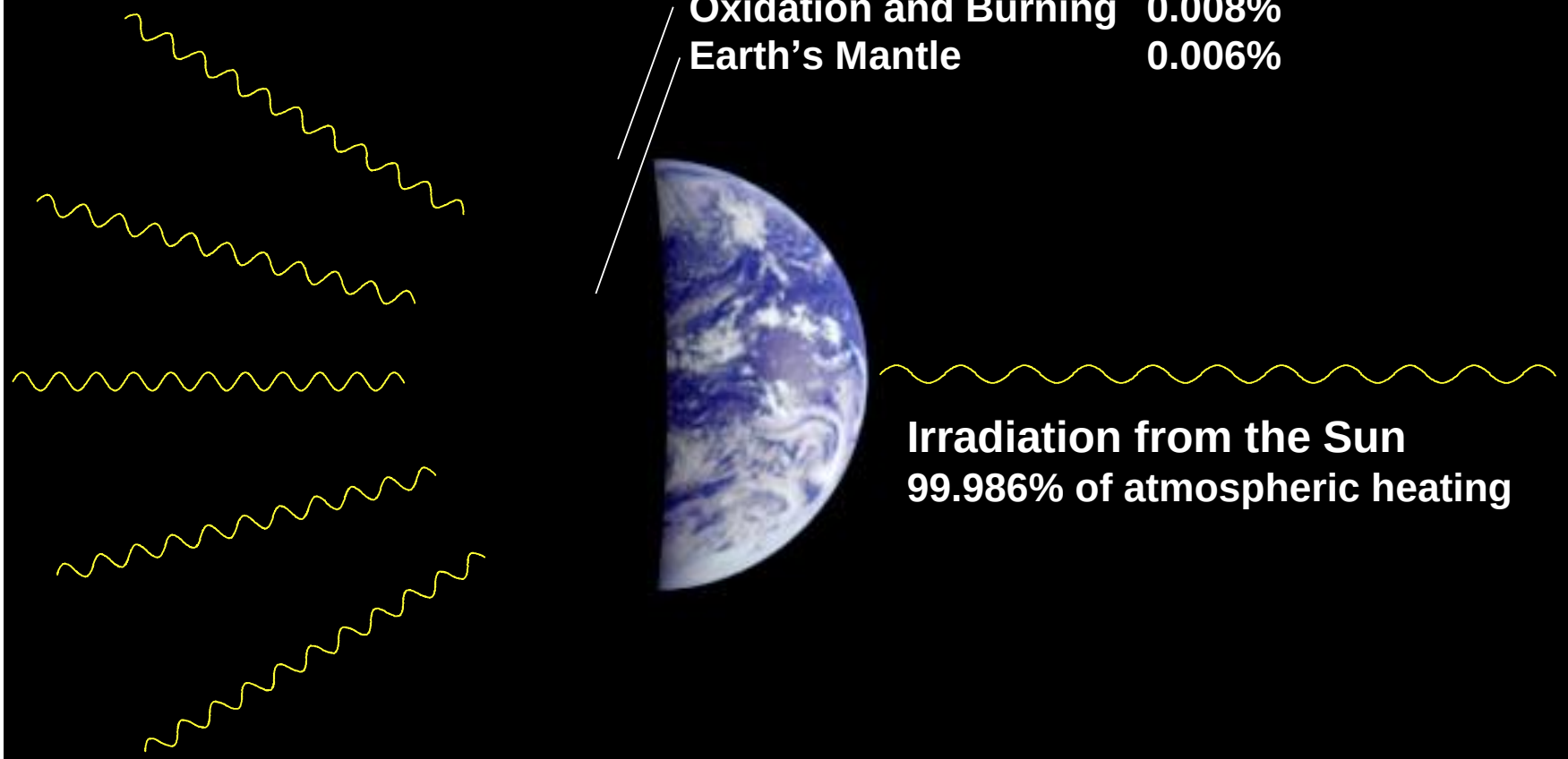
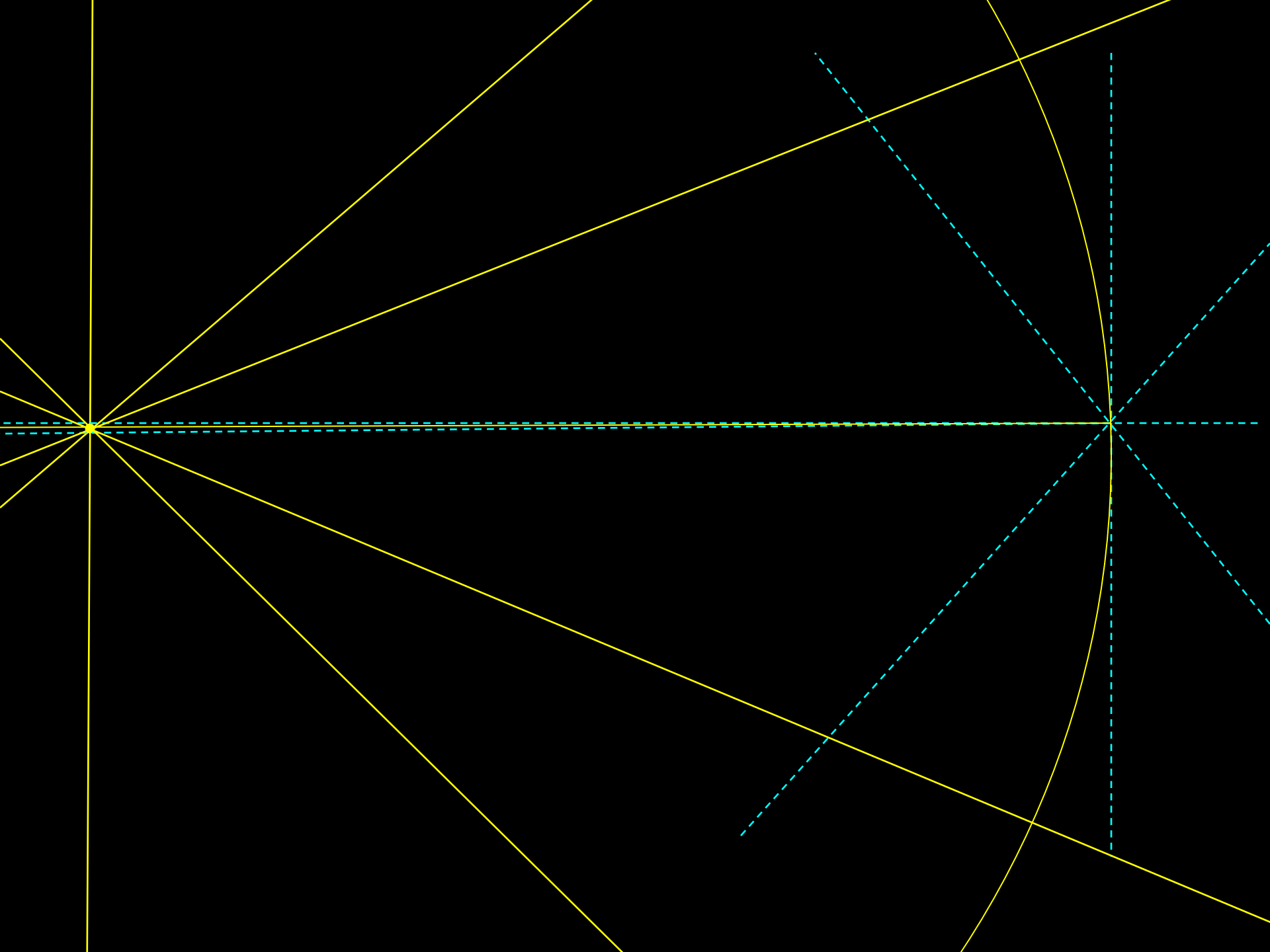
The Earth's Heat Balance





RADIATION from the SUN to the DEEP SPACE

STEFAN-BOLTZMANN EQUATION

$$q_{so} = \sigma A (T_s^4 - T_o^4) F / [(1/\varepsilon_s)+(1/\varepsilon_o)-1)]$$

$$F_{os} = 1$$

I. RADIATION from the SUN to the EARTH

II. RE-RADIATION from the EARTH to DEEP SPACE

FACTORS AFFECTING the EARTH'S TEMPERATURE

ORBIT / ATMOS / SOLAR

$$T_e = (r_s/2R)^{1/2} \, (\varepsilon_a/\varepsilon_e)^{1/4} \, T_s$$

RADIATION HEATING

PLANCK'S EQUATION

$$I(\lambda,T)=[2\pi hc^2/(\lambda^5)]*[1/(e^{(hc/\lambda kT)}-1)]$$

$h = 6.6255 \times 10^{-27}$ erg-sec

$c = 2.9979 \times 10^{10}$ cm / sec

$k = 1.3805 \times 10^{-16}$ erg / ^oK

SUMMARY - I

- HEAT INPUT to EARTH = HEAT OUTPUT
- RADIATION IS THE PREDOMINANT HEAT FLOW MECHANISM
- SOLAR “CONSTANT” IS VARIABLE
- RE-RADIATION POWERFULLY STABILIZES THE EARTH’S TEMPERATURE

SUMMARY - II

THE SURFACE TEMPERATURE OF THE EARTH IS DETERMINED BY:

- ENERGY from the SUN
- DISTANCE from the SUN
- ABSORPTIVITY / EMISSIVITY of the ATMOSPHERE

SUMMARY - III

- BASED ON DOE-EIA FOSSIL RESERVES – EXPECTED LIMIT IS 600 PPM CO_2
- FROM DATA AVAILABLE, THE CALCULATED CHANGE IN EARTH'S TEMPERATURE IS OF THE ORDER OF THAT EXPERIENCED SINCE THE INDUSTRIAL REVOLUTION

GEOSOLAR ENGINEERING

END