The Atmospheric Greenhouse Effect and Global Warming

Short Course, March 2025
Indian Institute of Technology, Kharagpur
Homework 1

Due Thursday March 20
(Results will be discussed in class on March 20. Please come prepared. The instructor may call upon you to present the solution.)

Develop a short program to compute the fraction of blackbody radiation in the wavelength range $[\lambda_1, \lambda_2]$ at any given temperature T using the series solution given in class. To test it, calculate the fraction of solar radiation in the sub-visible range [0, 0.4] μm, in the visible range [0.4, 0.7] μm, and in the infrared range [0.7, ∞] μm. State any assumptions made. Compare your answer (% error) against the value obtained using blackbody radiation tables. You may want to tabulate your results.

Note: you will use this program for future calculations in this course. So, it is imperative that you complete the HW whether you are able to meet the deadline or not.