

UCF Physics: AST 6165 Planetary Atmospheres

Spring 2020 Homework 2, DUE Thursday, 23 January 2020

Reading for this assignment: Andrews, Chapter 2 through 2.4.

Problems:

Follow homework format on syllabus for each sub-problem!

1. (10 points) Using a simple physical argument (no calculus needed! what is pressure?), estimate the total mass of the Earth's atmosphere.
2. (3×10 points) Find three different methods of reducing global climate change by means other than reducing the industrial production of CO_2 . These might include various ways of removing CO_2 from the Earth's atmosphere or reducing the sunlight that reaches the surface. For each method, give a URL to a description of the physics or chemistry of the method. Describe the method, state how much it costs per unit of benefit (e.g., per ton of CO_2 removed or per terajoule of sunlight reflected). State in what form and where any removed carbon is stored, and on what time scale it returns to the atmosphere. State any side consequences and any major challenges (technology to be invented, international cooperation, environmental impact). In your estimation, how viable is each method?