

CORS221 Module 3 Homework 3

Out: 2010 November 16

Due: 2010 November 30 9:30AM Pacific Standard Time

1. Multiple Choice

- Which one of the following parameters is not involved in the Milankovic cycles?
(a) orbital inclination (b) orbital eccentricity
(c) longitude of orbital periapsis (d) obliquity
- For the past 1.2 million years, what has been the time interval between glacial cycles?
(a) 400,000 years (b) 100,000 years (c) 41,000 years (d) 26,000 years
- What was the Earth's sea level during the glaciation 20,000 years ago?
(a) 100 meters higher (330 feet) (b) 30 meters higher (100 feet)
(c) up and down a few meters, but within 3 meters of its present value
(d) 120 meters lower (400 feet)
- When did the present ice age series of glaciations start?
(a) 65 million years ago (b) 50 million years ago
(c) 2.3 million years ago (d) 15,000 years ago
- Which of the following was not covered in ice during the most recent glaciation?
(a) Buffalo, NY (b) Vail, CO (c) Burlington, VT (d) Moscow, ID
- How does the Sun's heat turn into light that gets to the Earth?
(a) blackbody radiation (b) hydrogen fusion
(c) light amplification by stimulated emission of radiation (d) solar wind
- When it formed, the Sun was only 70% as bright as it is today. How long ago was that?
(a) 4.6 trillion years (b) 4.6 billion years
(c) 4.6 million years (d) 4.6 thousand years
- With the Sun only 70% as bright as today, what was the Earth's equilibrium temperature then? Assume that a and A remain the same as today, but that the value of F is only 70% as large as today's value.
(a) 273K (b) 255K (c) 233K (d) 215K
- Even with the answer to the above question, there was still life and liquid water on Earth early in its history. This is known as the Faint Young Sun paradox. How could the Earth have remained warm enough for water if the Sun was so much dimmer?
(a) increased solar wind (b) a more vigorous solar magnetic cycle
(c) greater greenhouse warming (d) increased moonlight
- When there are more sunspots, the Earth's climate gets:
(a) colder (b) warmer (c) cloudier (d) dryer

2. Short Answer

11. Describe, without necessarily using equations or numbers, what *orbital eccentricity* and *longitude of periapsis* are.

12. How do the Milankovic cycles drive glacial-interglacial cycles?

13. Show how the greenhouse effect works. Use both a paragraph and a diagram.

14. What mechanism keeps the Sun's energy generation rate steady? Describe it.