

## Midterm Exam - History of Earth Systems

Examples of types of questions I will be expecting the students to be able to answer.

There will be 20 short answer format questions and 2 essays.

### A. Short answers (1-2 sentences – 3 pts each)

1. Which elements were created at the “Big Bang” and approximately how long ago did this event occur?
2. Where do most of the major cations in seawater come from?
3. What process is responsible for most of the isotopic fractionation of carbon in organic matter?
4. What cell is thought to be the source of the original mitochondrion?
5. What processes are the primary drivers of thermohaline circulation?

### B. Essays

1. There are several hypotheses on the origins of life. Choose two, describe their core concepts, and explain both strengths and weaknesses of each.
2. In the process of oxygenation of Earth’s atmosphere, many (bio)geochemical cycles changed simultaneously. Choose two cycles that were affected by the net production of oxygen, describe how each changed and explain how the change influenced (i.e., the feedback on) oxygen production.