Astr450 Assignment 3: Definition of life - case studies
due Thu Sep 17, 2009

Word limit: 250

In class, we discussed the five functional definitions of life: reproduction, metabolism, use of energy, evolution, and increase in complexity over time. Discuss each of the examples below and draw a conclusion upon the utility of these five functions.

1. The dragonfly is one of the oldest types of organisms on Earth. The fossil record tells us that the dragonfly has remained essentially unchanged for some tens of millions of years, i.e., the dragonfly has not evolved in all this time. Is it alive? Defend your answer.

2. A mule is the offspring of a donkey and a horse. It is a sterile animal, i.e., unable to reproduce. Is it alive? Defend your answer.

3. A virus can reproduce and evolve, but cannot do so alone; it needs to hijack these functions from a living cell. Is it alive? Defend your answer.

4. Do these five functional definitions comprise a complete description of life’s functions?

Requirements for a good assignment

- The assignment is not a group project. All work must be completely original. The assignment will be graded strictly, as expected for a 400-level course. All assignments are weighted equally.
- Have your name, SID, and a word count at the top of the paper. Use question-and-answer format when writing your assignment, do NOT hand in a run-on paragraph (50% penalty).
- Be typed, double-spaced, and within the word limit. Assignments longer than the word limit will receive zero credit. Equations and diagrams can be hand written.
- Reference all sources of information you use.
- Use quotations only to illustrate your point, not to make it. If you are unclear about this requirement, then speak with the instructor.
- Show completeness of information, conciseness of expression, have a logical development of ideas, and evidence of thought regarding the content.
- Be professional of presentation, e.g., no ragged ends, creases, or ink blobs on the paper.
- In all ways, show pride in your work.