

Space Science & Astrophysics

Test T04 Directions

- Please type your answers to this test.
- Prose is expected to be of higher quality than an in-class test; specifically, sentences should be grammatical and relevant, with minimal misspellings.
- You may consult written or online sources but not other people (including classmates). If you refer to an outside source, you must cite it (at least name, title, and web address if applicable).
- Please turn in a printed copy to Mr. Gilroy on Wed May 20 in class.
- There will be a survey on the class linked through the blog by Wed May 20. Completion of it is optional.



SPACE SCIENCE & ASTROPHYSICS

T04: Black Holes, the Beginning, and the End

created: 2009 0108

revised: 2009 0514

NAME:

If you take this on computer, make sure to put your name in the file. **Running any other application than Word will be considered a violation of the Honor Code.**

Make sure to indicate which questions you are answering, both below and on your answer sheet.

Short Answer: Answer five (5) of the following questions, each with 2-3 sentences.

S01: Describe spaghettification.

S02: What is an event horizon?

S03: Can a black hole be the source of a nova? Why or why not?

S04: What is the theory of inflation (in a cosmological sense)? How is it related to the hypothetical Big Rip and how is it different?

S05: In *Annie Hall*, why does Woody Allen think Brooklyn is expanding? How does cosmology answer the question of whether Brooklyn is expanding?

S06: What was the major contribution of Edwin Hubble to cosmology?

S07: Give two examples of where the phenomenon of *redshift* has played a crucial role in the development of astrophysics.

S08: Write and answer your own short-answer question on any topic from the course.

4 pts for picking a relevant topic	4 for writing a meaningful, non-trivial question <i>that hasn't been asked on a quiz or test</i>	4 pts for the (correct) answer
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Essay: Address one (1) of the following topics in an essay 3-5 paragraphs in length. The essay should be well-structured!

E01: Modern cosmological theory offers several possible ultimate fates for the Universe. Describe three possible ways the Universe will end.

E02: Black holes are the extreme expression of the *curvature* of spacetime under General Relativity. What does it mean for *space* to be curved? How would that express itself physically? (In other words, what could you see that would indicate that space is curved?) What does it mean for *time* to be curved? How would that be observed?

E03: *Why* do people study cosmology? What questions are they hoping to answer? what sort of questions are beyond the reach of cosmology? Are those important questions too?

Short answer (max = 12 each)							
S01	S02	S03	S04	S05	S06	S07	S08
Essay		E01		E02		E03	

(max = 40)						
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