ASTR 3740 Relativity & Cosmology Spring 2023. Problem Set 1.
Due Wed 25 Jan

1. A Scene Seen near c

Explore the web to answer the four questions below. A good starting point is to play the "A Slower Speed of Light" game posted at
http://gamelab.mit.edu/games/a-slower-speed-of-light/
Describe what a scene looks like when you pass through it at near to the speed of light. In particular, answer as precisely as possible:

(a) Aberration

In what way does the scene appear distorted?

(b) Color Changes

Are the colors changed, and if so in what way?

(c) Brightness

Is the scene changed in brightness, and if so in what way?

(d) Time

Is the scene speeded up or slowed down, and if so in what way?

[Comments: This problem is a test of your powers of observation, and your ability to synthesize facts from a variety of sources into a coherent physical picture. You should reference the sites you use to draw your conclusions. Do not attempt to explain what you see mathematically — we will be discussing the problem mathematically in class later on.]

2. What's Wrong?

What is wrong with John Walker's C-ship movie at
http://www.fourmilab.to/cship/flythru.html