March 24, 2010

Third Exam this Friday, Review Sheet posted.

Review Session Thursday, 5 - 6 PM, WEL 2.246 (special review for those with whom I've talked, Tonight, 5 -6 PM in my office). Office hours today, also tomorrow, Thursday at 1 PM.

Reading: Chapter 7, SN 1987A, Chapter 8, Neutron Stars - Sections 8.1, 8.2, 8.5, 8.6, 8.10, Chapter 9, black holes, curved space, Sections 9.1, 9.2, 9.3, 9.4, 9.5.1.

Astronomy in the News?

Pic of the Day - orbiting galaxies will merge in a few billion years.

One Minute Exam

In the corresponding two-dimensional embedding diagram, the interior volume of a real, three-dimensional planet would be represented as:


A point


A line


An area


A volume

Goal:

To understand the “real” curved space of a gravitating object in three dimensions

3 D gravitating space is not a "cone;" that is just an artifact of the 2 D embedding diagram.

Real 3 D space around gravitating objects has the properties:

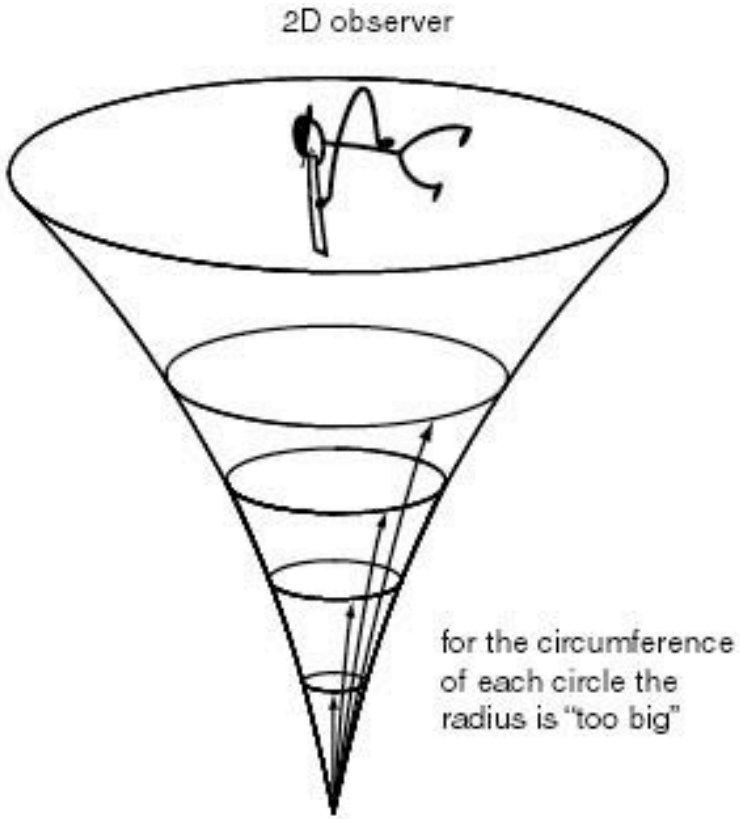
$C < 2\pi R$

Δ not equal 180^{o}

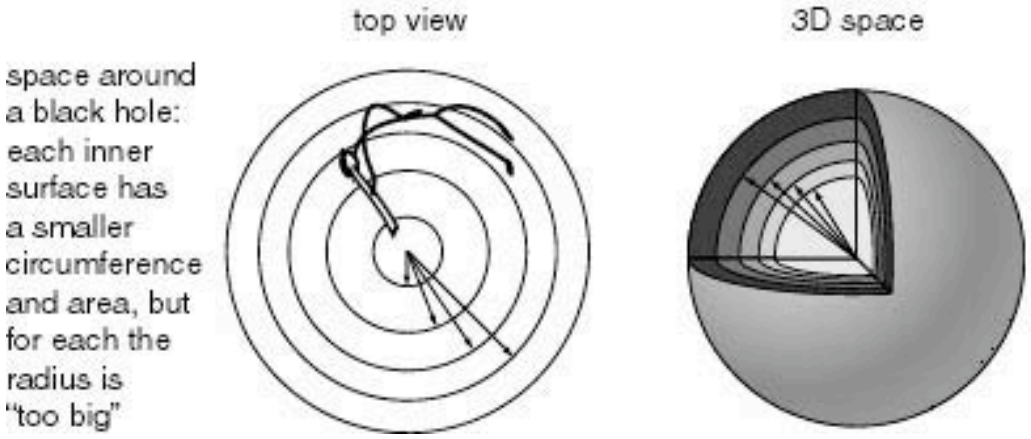
// lines cross

light is deflected (this one has been experimentally verified)

Fig 9.6



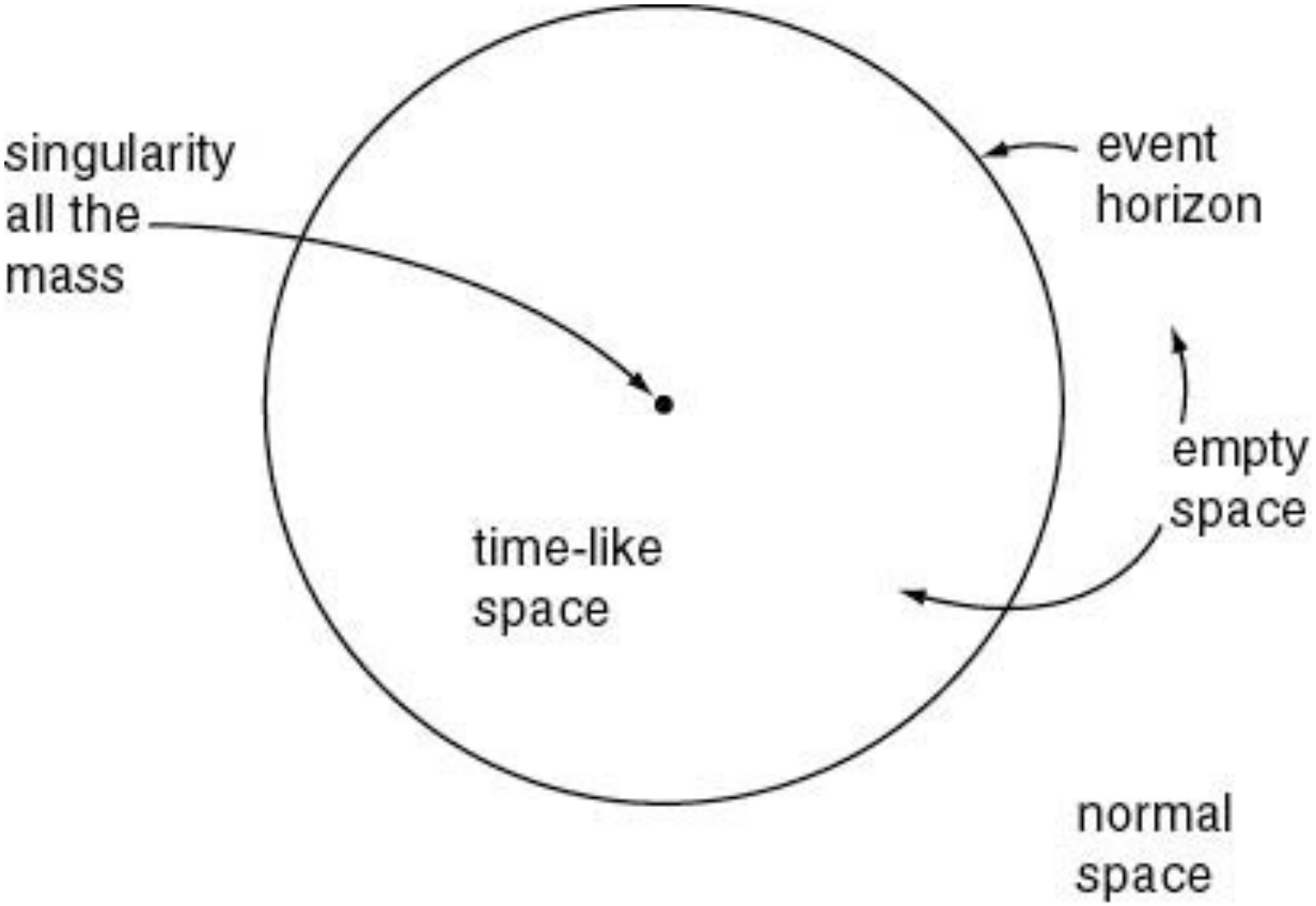
Curved 3D space



Goal:

To understand the basic features of a black hole

Figure 9.1

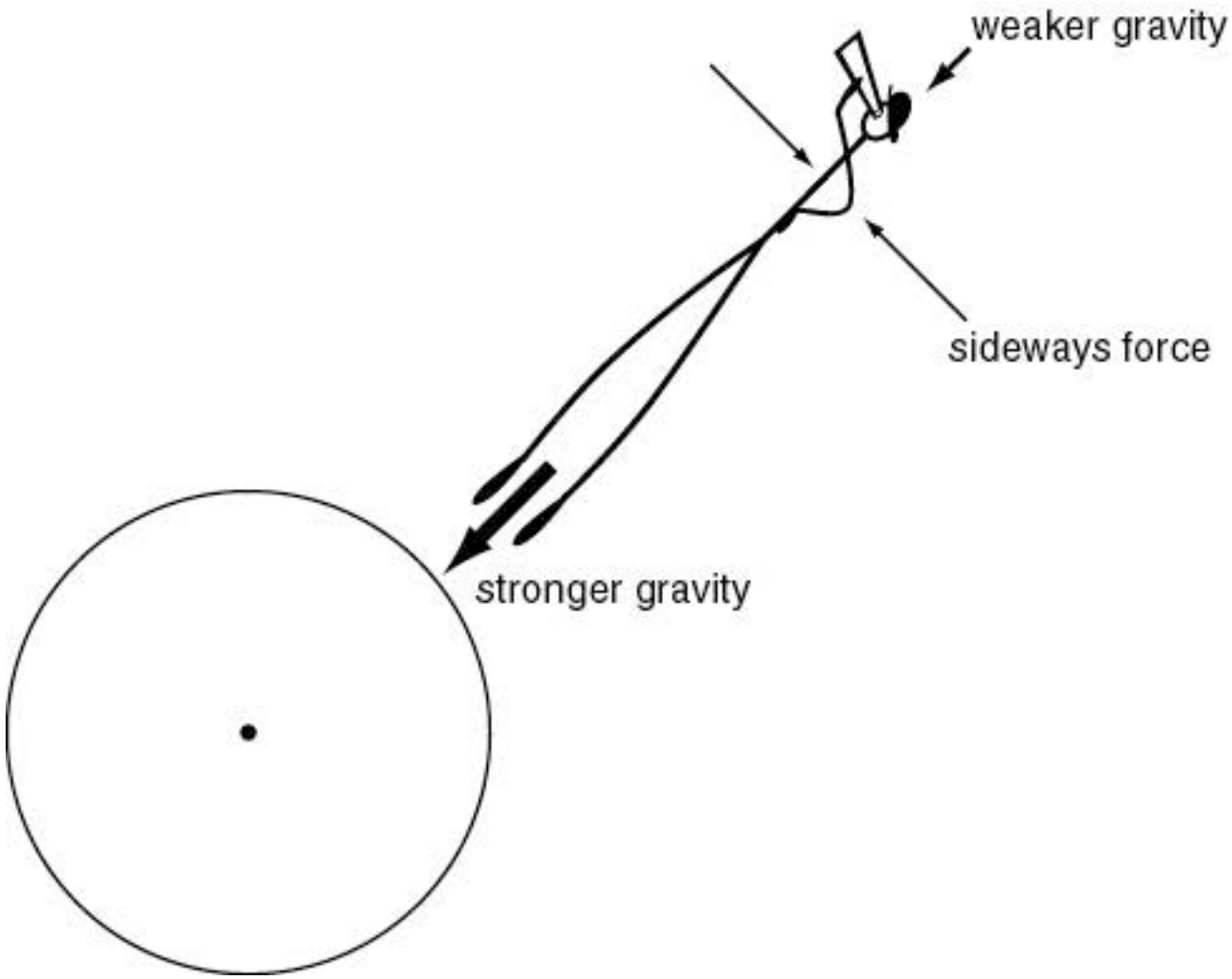


Basic properties of a (non-rotating) black hole

Goal:

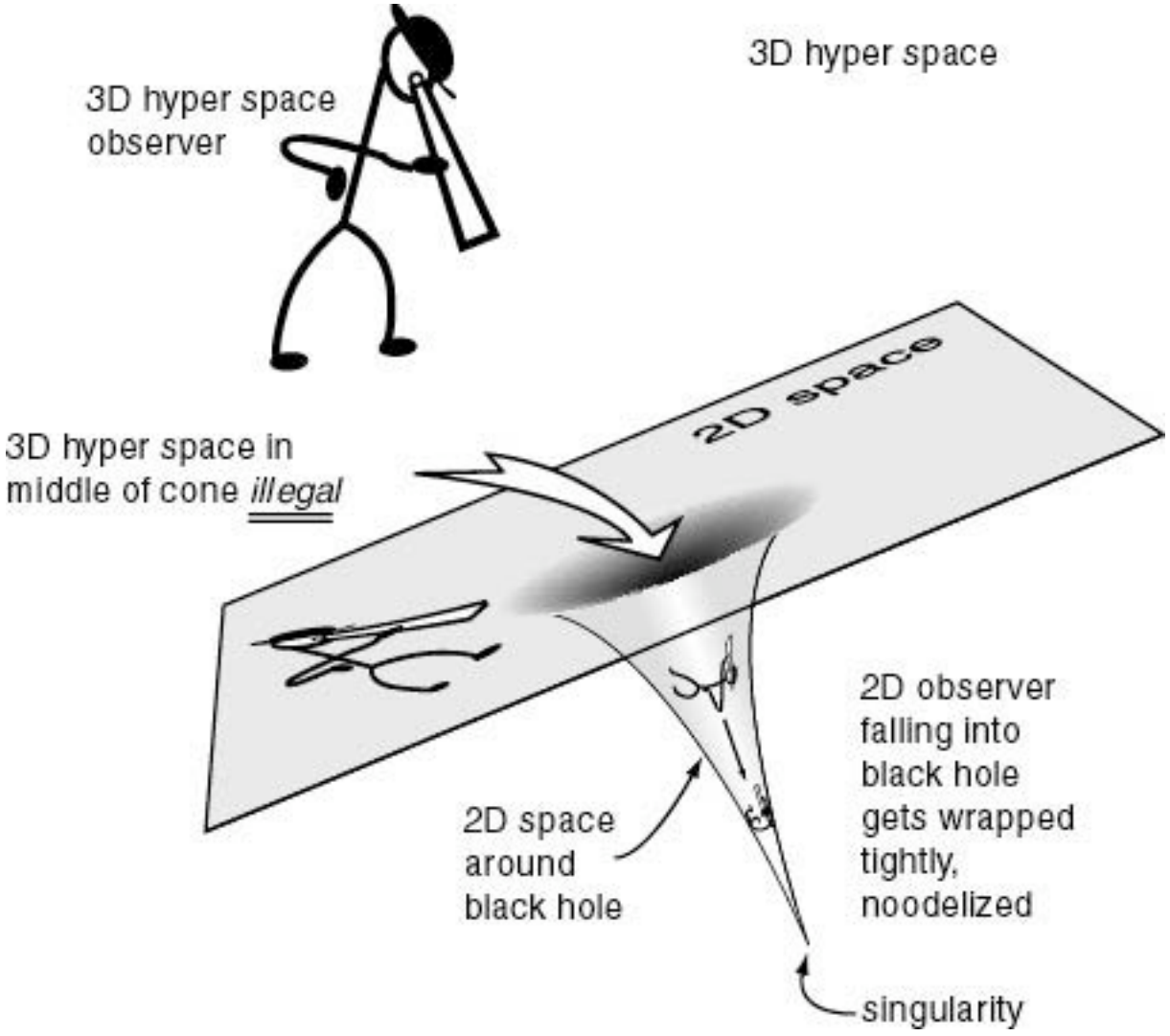
To understand what it is like to die falling into a black hole.

Figure 9.2



Tidal Forces

Figure 9.3



2D embedding diagram of 3D curved space around a black hole

End of Material for Test 3