

NAME: _____

ASTRONOMY 106

Learning About Space in Cyberspace

A. The Western Kentucky University ASTR 106 homepage

For this lab exercise you are required to access the world wide web as a resource to learn more about astronomy. The recommended starting point for this activity is to check out the html version of this lab writeup, available on the Internet at: <http://astro.wku.edu/astr106> The main advantage to starting from this website is that you can just click on the necessary links instead of having to correctly type them all. You will still write your answers on this hardcopy and submit it for grading.

B. MasteringAstronomy : The homepage for your textbook, “*The Cosmic Perspective*”

The entry point for *The Cosmic Perspective* companion website is reached by loading the following URL into a web browser: <http://masteringastronomy.com/> and gaining entrance to the password protected site by submitting a valid access *MasteringAstronomy*. It is not possible to share an account, nor to reuse someone else’s old access code. If you have acquired a used copy of the text which does not contain a valid access code, you must use a credit card to purchase stand-alone access.

The first destination will be to investigate the **Assignment List**, accessed from the lefthand menu tabs.

- 1) Open the assignment “Cyberpace Lab: process of science,” an example of a sorting task, utilizing Flash animations to allows one to drag and drop images and sort them as instructed.
- 2) Open the Concept Quiz for Chapter 1, Our Place in the Universe and answer all 16 questions.
- 3) Open the Visual Quiz for Chapter 1, Our Place in the Universe and answer all 10 questions.

The TUTORIALS are unique to Astronomy Place and should help you understand some typically troublesome concepts. While it is not a topic we cover in ASTR106, I recommend the Phases of the Moon tutorial as being one of the best presentations of this concept which I have ever experienced. The zoom sequence in Lesson 1 of the Phases of the Moon demonstrates the emptiness of space and the difficulties inherent in trying to construct a true scale model of our solar system.

- 4) As the Lesson 1 animation zooms in on Earth’s orbit, describe what happens to the arrows at the right side which represent the direction of the Sun’s rays.

C. Web sites with Pretty Astronomy Pictures

Astronomers were some of the primary non-military creators of what has evolved into the Internet, using computers to transport digital images and large data sets between research sites in other states or even other nations. Thus, it should be no surprise that the current incarnation of the Internet has a plethora of pretty pictures available for downloading. These days most computers have

enough memory and disk storage to readily display large images, and printers allow every computer user to view and print out hard copies of the images.

The latest pictures from the Hubble Space Telescope are available at:

<http://hubblesite.org/newscenter>

5) Use the PRINT option, by dragging down the "File" menu at the top of the Netscape frame, to get a hardcopy (black & white is fine) of one of the latest HST images. Write your name and the date on the printout and staple it to the back of this writeup.

The Astronomy Picture of the Day, drawn from a diverse set of images, is at:

<http://antwrp.gsfc.nasa.gov/apod/astropix.html>

6) What was the "Astronomy Picture of the Day" on your last birthday? Date of birth: _____
Title of picture (you do not need to print it out):

D. Informational web sites

One of the many websites which provide interesting and accurate information is the Space Telescope Science Institute's Amazing Space web site at

<http://amazing-space.stsci.edu/resources/explorations/>

7) Enter Amazing Space's Truth About Black Holes section and click on Dante's quote to view the "No Escape..." entry page. Select the "Is a Black Hole Really a Hole" to begin exploring the true nature of one of the mysterious forces in the universe. Navigate around with the icons in the top right corner until you arrive at the Pathway to Discovery page. From the historical timeline presented on this page, give the years when John Michell _____ and Simon Pierre LaPlace _____ first predicted the existence of black holes?

Go to the Star Child website:

http://starchild.gsfc.nasa.gov/docs/StarChild/universe_level2/universe.html
and view "The Journey Into A Blackhole", an interesting video clip available in many formats.

You should also visit the Exploratorium at

http://www.exploratorium.edu/learning_studio/news/october97.html

Click the CONTINUE button at the bottom right and browse the story "SERENDIP: Searching for Life", a multimedia presentation of one current search for radio signals from intelligent ETs.

8) To search for radio signals from other intelligent civilizations, we would like to narrow the possible frequencies to which we should tune the radio receiver. One possible option is to focus on the radio wavelengths where there is the least background noise. From the SERENDIP story, complete the following sentence: SERENDIP investigators are searching the radio spectrum in the _____ hole.

E. Interactive web sites

Some web sites include fun activities which allow you to learn while playing interactively. I recommend two sites in particular:

International Dark-Sky Association at: <http://www.darksky.org/images/images.html>

At this site you might want to look at the "satellite imagery" option for "Individual USA States" to try and pick out Bowling Green or your hometown.

The "Imagine Science" section of the **Imagine the Universe** website has many

exercises to play with: <http://imagine.gsfc.nasa.gov/docs/homepage.html>

Return to The Exploratorium at http://www.exploratorium.edu/learning_studio/news/october97.html

9) Go to Exploratorium's "Build a Solar System" calculator, enter a model diameter of 12 inches for the Sun, and let the website's computer calculate the sizes of other types of stars.

What type of star is the hottest and how big in feet will be its diameter? _____

What type of star is the coolest and how big in inches will be its diameter? _____

What is the name of the largest star and how big in feet will be its diameter? _____

How big in inches would be the diameter of a typical white dwarf star? _____

How big in inches would be the diameter of a typical neutron star? _____

F. Searching the Internet

The ultimate use of the Internet is to be able to find the information you desire from among the vast possibilities of cyberspace. In recent years the most important improvement in web access technology is the availability of powerful search engines such as Google, AltaVista, Yahoo!, Excite, Lycos, and many others. One way to call up a search engine is to click the "Net Search" button on the lower strip of the top of the Netscape frame. This takes you to a random search engine, but also offers the selection by name of most of the other major search engines.

10) See what web sites are suggested when you search on one of the following important astrophysical topics: **extrasolar planets, black holes, Hubble constant, or supernova.**

Use your web browser's Print button to obtain a copy of the top ten web sites recommended by your choice of search engine. On this printout, clearly indicate which sites actually deal with astronomy. Staple it to the back of this writeup.

G. Judging the Reliability of Information in Cyberspace

One of the least attractive aspects of the World Wide Web is that anyone with Internet access can produce a web site stating any combination of truth, fiction, or downright lies. Nobody should ever believe everything she/he reads, but the historical difficulty in getting magazines and books published used to at least limit the amount of idiotic trash which got printed. The Internet, however, allows a cheap way to disperse information which looks every bit as reliable as the news available on the CNN or US Congress web sites. It puts a new burden on the reader to use her/his brain to filter useful, reliable, and honest information from illogically linked pseudo-facts.

Today the Net is becoming the preferred information resource, as opposed to approaching professionals with questions which they want cleared up. One common question which astronomers used to be asked is, "My friend doesn't believe that humans ever landed on the Moon, what can you say to convince him otherwise?" The pro-hoax people, who believe that Apollo astronauts never landed on the Moon, have brought their arguments to the Net. In response, other websites have been produced which specifically counter the pro-hoax claims. Each of us can view these sites with an open mind and see which argument is most convincing. Here are two groups of Internet links with opposite points of view regarding whether the Apollo program ever placed humans on the Moon.

Pro-Hoax

<http://omissioncontrol.blogspot.com/>
<http://batesmotel.8m.com/>
<http://www.primeline-america.com/moon-ldg/>
<http://www.ocii.com/~dpwozney/index.htm>

Anti-Hoax

http://pirlwww.lpl.arizona.edu/~jscotti/NOT_faked/
<http://clavius.org>
<http://www.apollo-hoax.co.uk/homepage.html>
<http://www.redzero.demon.co.uk/moonhoax/>

11) Carefully **read at least two** sites from each category, paying attention to the content and style used by each author to promote her/his side of the story. After reading the claims on these web sites, **list in your own words at least two arguments** which make you less likely to trust the pro-hoax authors' version of the debate?