

PHYS178 – Assignment 10.

Due: Monday 10th November 2008

This assignment contributes 2% to your final grade. Please write brief answers directly on the sheet in the spaces provided (and on the back if necessary). The assignment should be turned into the PHYS178 assignment box on level 2 of E7A.

1. Outline some of the challenges that have to be overcome before we can detect earth like planets around other stars

The glare of the host star

The relative mass differences between the planets and host star

The distances to even the closest stars

The small angles subtended on the sky by planets around even the closest stars

The tiny wobbles induced by orbiting of planets around the common centre of mass

2. Explain why the currently observed properties of extra-solar planets are not necessarily representative of the general planetary systems that might exist

The current technology is only sufficient to enable the largest extra-solar planets to be detected that are close to their host stars. There is a very strong selection effect operating

3. Briefly describe 3 examples of 'extreme life' on earth

extremophiles – mostly microbial life:

1) Deep underground in rock – no light, oxygen etc: micro

2) Microbes detected from deep ice cores

3) Thermophiles found around deep underwater vents at incredible temperatures and pressures

4. Discuss in less than 200 words the theory of panspermia.

Essentially the idea that life on earth has been seeded by organisms that are moving through interstellar space. Panspermia is the theory that the stuff of life is everywhere and that we humans owe our genesis and evolution to a continual rain of foreign microbes. The concept of panspermia has been around for centuries and it has received varying amounts of endorsement from the scientific community. Although long shunned by most scientists, certain types of panspermia have recently gained support. While the prevailing theory for the origin of life is still that the first organisms formed spontaneously out of a nutrient soup during the early days of Earth and then evolved through random mutations and natural selection, the theory of panspermia is not ruled out.