

## 普通天文學 二〇〇七年秋 期中考

2007.11.05 下午 3 : 00 ~ 4 : 50

一、翻譯並解釋下列名詞（每小題 4 分）

(1) vernal equinox; (2) parsec; (3) precession; (4) Polaris; (5) ecliptic;  
(6) Universal time; (7) adaptive optics; (8) parallax; (9) retrograde motion; (10) spherical aberration

二、問答題：每題 10 分

1. Describe Kepler's three laws of planetary motion. The third law actually applies to more than planetary motion, but to any two bodies in motion as a result of their mutual gravitational force. A pair of stars, one with a mass equal to, and the other 3 times, that of the Sun, orbits each other with a period of 4 years. Assuming a circular orbit, calculate the separation between the stars.
2. The Hubble Space Telescope (HST) has a primary mirror of 2.4 m diameter. What is the optical diffraction limit of the HST if observing in the optical wavelengths? Each Keck Telescope has a mirror equivalent to 10 m in diameter. Compare the light-gathering power and the angular resolving power of the HST and the Keck Telescope.
3. How does the Earth's atmosphere affect ground-based astronomical observations? What are the advantages and disadvantages of a space observatory?
4. There are two major kinds of telescopes in terms of the way light is gathered, by reflection or by refraction. Describe the main properties of a reflector versus a refractor. What are the good features and limitations of each kind?
5. Sirius, the brightest star in the night sky, has a white-bluish color and a surface temperature about 10,000 K. What is the wavelength where Sirius has its most intensive radiation?
6. Devise a test question based on your knowledge learned for this course, but not covered in the questions above. Provide an answer to your own question.