OE Protocol 2016.04.26 By Ruizhe Lyu

1. Free question.

2. Choose an optical system.
A: I chose telescope. And professor directly asked me to draw a sketch of Kepler telescope.

3. Suppose a parallel beam incident to the first lens, with angle α to the axis, what will happen at the first focal point. What is the image called, and what is the height of the image.

4. Then, how is the intermediate image magnified by the ocular, and derive the magnification of the Kepler telescope.
A: Derive the relationship between the incident angle and exit angle, using the focal length of two lenses.

5. Then he talked about the binocular, ask me to choose one among 10x50, 10x40, 10x30. Also the meaning of each number.

6. The typical diameter of pupil is 3mm in the day, and if you choose an ocular of 5mm, it will be larger than the pupil, meaning a lot of light will be wasted. Why do you choose the 10x50 one?
A: because I can use it in the night. At night the pupil is larger than 5mm.

7. What is spectrometer? What can we do with it.
A: separate light of different color.

8. A grating is used. How does it work? What is the mathematical description of a optical grating?
A: Comb function.

9. If a concave lens and a screen are put behind the grating, what can you see? What is the mathematical work of the lens?
A: Fourier Transformation.

10. What is the relation between the distance between two gating slits and the distance between two bright stripes?
A: Inverse relationship.

11. Draw the sketch of a spectrometer using optical grating. Then use lens to replace collimator. So why don´t people use lens instead of concave mirror?
A: Lens has chromatic dispersion, while mirror dosen´t.