

PHYS342 Exam3 Topics (Chap. 5, 6, 7)

Chap5. Eye I: Producing the image

Functions of (cornea, eye lens, sclera, choroids, retina, humor, Iris, pupil)

Compare the image producing process between eye and camera

Field of view (Prey vs. Predator),

Far point and near point of human vision

2 lens systems in eye and functions,

Accommodation, Adaptation

Cones and Rods, color reception, Fovea and blind spot

Stiles-Crawford effect; Photopic vs. Scotopic conditions and photoreceptors

Chap6. Eyeglasses and optical instruments

Vision: normal myopic, hyperopic, presbyopic, astigmatism, cataracts

How to fix the vision problems? Power of eyeglasses, Diopters

Limit of optical microscope,

Telescope; Functions, Powers, Objective and eye piece.

Reflector vs. refractor (advantages and problems)

Galilean telescope vs. Newtonian telescope, Hubble telescope, VLA

Chap7. Eye II: processing the image

Path of image processing; Photoreceptors – bipolar cell – ganglion cell – optic nerve – brain

Function of horizontal and amacrine cells

Weber's law on human brightness perception

Lightness vs. Brightness,

Lightness Constancy

Simultaneous lightness contrast

Successive lightness contrast (adaptation)

Afterimage from adaptation and eye scanning

Lateral inhibition (edge, Contrast, Herman grid)

Channels