Astrophysics lab notes

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$$\text{Lab Course} = \text{Course}(\lambda) \tag{1}$$

Objective of this course: *how to build an astronomical instrument* which will push the limits of astrophysical knowledge and technology.

0.1 Orders of magnitude

Diameters: in the future 24 m, 37 m.

Resolution: 0.04 arcsec for the HST.

Collected photons: 2700 Hz for an eye at $V = 6$.

For a galaxy at redshift $z = 10$, the Lyman (?) break at 91.4 nm is shifted.

In the background: magnitude 18 (with moon), 21 (no moon) per arcsec square.

10 meters, "seeing limited": 1 arcsec; 1 meter, "diffraction limited": 0.1 arcsec. Collection ratio: 100X, but the size of the background in which the unresolved source is located is also 100X.

We have a great school of *adaptive optics*.