

Astronomy 350, Autumn 2002, Problem Set 4

Due Thursday, October 31 in class

Problem 1:

The telescope in the Smith Lab dome is a 12-inch (30.48cm) f/10 LX200 telescope built by Meade Instruments. We have two CCD cameras available:

- 1) Apogee Instruments AP7 camera using a SITe 512×512 pixel CCD with 24μm pixels.
- 2) Santa Barbara Instruments Group STV camera using a TI TC237 640×480 pixel CCD with 7.4μm pixels.

Each camera's detector has square pixels.

- a) What is the focal length (in millimeters) of the LX200?
- b) What is the focal plane image scale of the LX200 in arcseconds/millimeter?
- c) Assuming no other optics, what are the pixel scales (arcsec/pixel) and fields of view (arcminutes) of the AP7 and STV CCD cameras?
- d) I can attach a simple "focal reducer" onto the front of the STV camera that will reduce the focal ratio of the telescope from f/10 to f/3.8. What is the STV pixel scale and field-of-view when the focal reducer is attached?

Problem 2:

This exercise is designed to acquaint you with the telescopes and instruments available at different observatories. Each of you is assigned an observatory site (or specific telescope at that site) below. Using the web or any other resources you can find, research these sites and answer the following questions:

- a) What focal stations are used (e.g., "two f/10 Nasmyth foci")?
- b) What imagers are available, (e.g., wavelength regions, pixel scales and fields of view)
- c) What spectrometers are available (wavelength regions, spectral, special modes like multi-slit or high-resolution)
- d) Who can apply for time on these telescopes (and are the telescopes operational yet – if not, when)?

Observatory/Telescope Assignments:

Jason Adkins: MDM 2.4-meter	Terrence Payne: Magellan 1 & 2
Cory Durban: Keck I	Mark Pitts: MMT
Ryan Gero: Keck II	Randolph Reed: LBT
Jen Grilliot: VLT UT1	Tom Scaife: CTIO 4-meter
Allison Heinrichs: VLT UT2	Jack Shepherd: Gemini North
Cassie Lundell: VLT UT3	Michael Sutherland: KPNO 4-meter
Jennifer McFerran: VLT UT4	Kyle Walker: Gemini South