

Ay 122a: Astronomical Measurements and Instrumentation

Assignment 6

Report due in Dimitri's mailbox at 5pm on Monday, December 5

Oral Presentation in-class from 2-5pm on Monday, November 28. Each talk should be 10min (with an additional 5 min for Q&A)

Below are listed some suggested topics for research projects. The idea is to get a sense of what the current thinking on one of these subjects is, and to present it in a well-organized and thoughtful fashion in the form of a <10 page report. Please include your own take and opinions, and the reasons for them, as part of the report. The idea is to go beyond the Public Relations web pages in the case of missions or projects, and discuss some aspects of the technical implementation and the science applications.

Consider structuring your report as follows:

- How does the instrument work? Consider the optics/mechanics/electronics etc. (as relevant)
- What science has been and is being done with instrument?
- What compelling science motivates a next generation of this instrument/facility?
- What advances or new technology enables such a new instrument/facility?
- How would the new instrument/facility work?

Suggested topics:

1. Adaptive Optics (e.g., OSIRIS and MODIUS)
2. Optical/IR Interferometry (e.g., CHARA and PFI)
3. Multiplexed Spectroscopy (e.g., DEIMOS and MS-DESI)
4. Infrared Telescopes in Space (e.g., Spitzer and JWST)
5. Wide-field Optical Survey (e.g., ZTF and LSST)
6. Detectors (e.g., CCD LFC and MKIDS Darkness)
7. Thermal Infrared Spectroscopy (e.g. VLT Visir and EELT Metis)
8. Near-infrared Spectroscopy (e.g. Keck MOSFIRE and TMT IRIS)
9. Radial Velocity Measurements (e.g. Keck HIRES and Keck KPF)
10. High contrast imaging (e.g. VLT Sphere and TMT PFI)
11. Wide-field Infrared Survey (e.g. VISTA VIRCAM and South-Pole Gattini-IR)
12. Modern X-Ray Instruments (e.g. NuSTAR and XXX)