Astro-Madness: Student Table Keys

Astro-Madness:Telescope Information

Telescope	Mirror Diameter	Telescope Tube	Year Completed	Special Features and Uses
0.8 m	0.8 meter	closed	1970	With the Prime Focus Corrector and CCD it can image large portions (about 3/4 degree) of the sky.
Otto Struve	2.1 meters	open	1938	Open tube structure. Mirror weights 1900 kg.
Harlan J. Smith	2.7 meters	closed	1969	Closed tube structure. Mirror weights 3540 kg. Coudé focus and high resolution spectrograph.
Hobby-Eberly	11 meters	open	1997	Third largest optical telescope in the world; specializes in spectroscopy. Primary mirror made of 91 one-meter mirrors.

Astro-Madness: Instrument Information

Instrument	Telescope	Spectro-graph (yes/no)	Image (yes/no)	Special Use, Field of View, Sensitivity
Cassegrain Spectrograph	2.1-m Struve	yes	no	Medium spectral resolution with resolving power of 600-2,500 over the wavelength range from 0.3 to 1.1 micrometers. Spectral and spatial coverage.
Prime Focus Corrector camera	0.8-meter	no	yes	Finding extrasolar planets, Near Earth Asteroids, comets, and supernovae. Wide field of view (45 arc-minutes, bigger than the angular size of the moon)
CoolSpec/RokCam	2.7-m Smith	yes	no	Wavelength range of 1 to 2.5 micrometers; infrared
Coudé Spectrometer	2.7-m Smith	yes	no	Medium to very high spectral resolution depending upon which grating is used (7 available).
IGI, IGP	2.1-m Struve or 2.7-m Smith	sometimes	sometimes	Two observing modes to obtain low resolution spectra or polarized light (polarimetry). Focal reducer optics for wide field of view and bright images,
Marcario Low Resolution Spectrograph	HET	yes	no	Limiting magnitude of 23 and the field of view is 4 arc-minutes. Has multi-slit object mode so that more than one object can be observed at once.
Argos	2.1-m Struve	no	yes	Measures the intensity of light with a CCD in very short time intervals. Narrow field of view (2.8 arc-seconds)

Astro-Madness: Example Student Telescope & Instrument Recommendations

These are *example* student responses that model the types of reasoning students should provide to justify their recommendations.

Problem Situation Principle Investigator	Telescope	Instrument	Justification
1. Starr Bright	2.7-m Harlan J. Smith Telescope	CoolSpec / ROKCAM	Light with a wavelength of 0.9 microns is 900 nanometers, or 9,000 Angstroms. This is near-infrared light. The CoolSpec is the near-infrared spectrograph instrument that produces infrared spectra, and ROKCAM is an infrared camera. Both these instruments mount onto the 2.7-m telescope.
2. Dr. Hugo Tumars	2.1-m Struve Telescope	Argos	The Argos camera is the only instrument that can take images rapidly (once every ten seconds). Dr. Tumars needs the 2.1-m Struve telescope because Argos only fits the 2.1-m telescope at prime focus.
3. Dr. Ima Stronomer	2.7-m Harlan J. Smith Telescope	CoolSpec / ROKCAM	Dr. Ima Stronomer needs the near infrared spectrograph and camera CoolSpec / ROKCAM because the ammonia wavelengths fall within the instrument's sensitivity range. She also needs the 2.7-m telescope since CoolSpec and ROKCAM only mount on the 2.7-m telescope.
4. Mr. Cal Q. Laater	0.8-m	PFC	The PFC provides wide field of view (45 arc-minute, more than the angular size of the full moon) that Mr. Cal Laater requires. This instrument is fixed to the 0.8-m telescope.
5. Dr. Usee Themun	2.7-m Harlan J. Smith Telescope	Coudé Spectrometer	The Coudé Spectrometer provides the high resolution spectra that Dr. Themun requires. Since the Coudé Spectrometer is fixed inside the 2.7-m telescope building, Dr. Themun needs the 2.7-m Harlan Smith Telescope.
	Hobby-Eberly Telescope	High resolution spectrograph (HRS)	The HRS also features the spectral resolution that Dr. Themun needs. In addition, the HET gathers lots of light, 16 times more than the 2.7-meter telescope. As a result, the accuracy and precision of his data may be better than he could obtain using the 2.7-meter telescope.
6. Ms. Sol Faraway	Hobby-Eberly Telescope	Marcario Low Resolution Spectrograph	Since the Marcario LRS features both an imaging mode and multi-object spectroscopy mode, she can collect multiple spectra and images in a single observation. HET is the only telescope that can focus light into the Marcario LRS.