

Session 70: Instrumentation

70.18

The SIMBAD Astronomical Database: Status and Prospects.

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The SIMBAD database provides identifications, measurement data and bibliographic references for roughly 600,000 stars and 100,000 non-stellar objects. It can be accessed from nearly any terminal connected to interactive networks.

The new SIMBAD III version, which has been in operation since mid-1990, uses a new language based on the concept of agents. The software opens the way for inclusion of very large sets of new data, as well as being able to handle sophisticated queries efficiently. It is hoped that SIMBAD will be of great assistance to astronomers wishing to combine data from a broad variety of observational techniques at different wavelengths.

70.19

The ALEXIS Guest Investigator Program

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The ALEXIS (Array of Low Energy X-ray Imaging Sensors) satellite, scheduled for launch in summer 1991, will continually map the sky in narrow spectral bands centered at 66, 72, and 93 eV. ALEXIS will carry out unique science, including mapping the soft X-ray background with 0.5  resolution, discovery and identification of transient sources, and synoptic monitoring of variable sources. Its wide field of view (half the sky) and narrow bandpass ($\Delta E/E \sim 4\text{--}8\%$) makes ALEXIS a unique complement to the EUVE and ROSAT Wide Field Camera missions. The information content from ALEXIS will be prodigious; approximately 125 Mbytes of data per day will be realized, and the entire sky will be mapped twice per year.

The ALEXIS data set will be opened to the general astronomical community via a Guest Investigator program. This program includes the development of data reduction and analysis software, setting up a data archive, and servicing investigators. We discuss the data available to guest investigators, anticipated instrument sensitivities, proposal and observation procedures, and prospects for Guest Investigator funding. Guest Investigators will be essential to optimizing the total science output of ALEXIS.

70.20

The Imaging Performance of the Hubble Space Telescope

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The Hubble Space Telescope suffers from significant spherical aberration and does not give the predicted diffraction limited images. A maximum of about 15% of the light from a point source is concentrated in a 0.1 arcsecond radius, where 70% was expected. The images consist of this core, surrounded by a complex 4 arcsecond diameter inner halo that contains most

of the light and is caused by portions of the primary mirror that are not focussing correctly. Ground test results uncovered by the Allen Commission agree with results derived from studies of the on orbit imagery.

The pointing performance is also degraded, with guide stars for fine lock presently limited to 13th magnitude, compared to an expected limit of 14.5 magnitude. Some areas of the sky are therefore not accessible in fine lock. In addition, the spacecraft undergoes severe pointing disturbances during portions of the orbit, caused by thermal shocks.

Nevertheless, HST represents an unique resource for high resolution imaging of low contrast bright objects through deconvolution techniques. Such techniques rely on the detailed information about the PSF that is given here. Furthermore, it can split higher contrast fields into components when photometric accuracy is not important. There is a loss of about 2 magnitudes in limiting for point sources.

70.21

The HST Non-Proprietary SnapShot Survey

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The Non-Proprietary SnapShot Survey takes short images of intrinsically bright quasars with HST's planetary camera (PC) during gaps in the primary observing program. All images are taken on gyros, avoiding the time spent acquiring guide stars. The targets are scattered throughout the sky so that only short slews are required. SnapShot targets are inserted in the observing program only after all OV/SV/SAO/EROS/GO/GTO targets are scheduled and only when they cause minimal operational impact. SnapShot targets always have the lowest priority. The primary science goal of the SnapShot Survey is to search for cases of gravitational lensing among luminous, high-redshift quasars. Although the degraded HST optics lower the sensitivity of the survey, the program can still exploit the sharp, inner core of the point spread function, and thus provide valuable information that cannot be acquired from ground based observations. During September-November 1990, thirty one images of fifteen quasars (in two colors) were obtained. The gyro drift rate was measured to be (4 ± 2) mas/s, about three or four times larger than the expected rate. The mean pointing error was approximately 25 to 30 arcseconds, so that about half of the targets were not placed anywhere on the PC. The STScI investigated the possibility of improving the gyro drift rate and the placement of targets, uncovering several software errors, that have been corrected. As further data are obtained, this study will both test and complement the results of similar ground-based optical surveys having lower spatial resolution.

70.22

Binary-Star Observations with the Hubble Space Telescope Fine Guidance Sensors. I. ADS 11300

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HST-FGS3 was used in the transfer-function scan mode to observe ADS 11300 = Hu 581 = WDS 18230+1458 (2000). The observational technique will be described, procedures of data reduction will be discussed, and a new orbital analysis for ADS 11300 will be presented.