

128.03

Initial Calibration Results for the Far Ultraviolet Spectroscopic Explorer(FUSE) Spectrograph

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We present initial results of the performance of the Far Ultraviolet Spectroscopic Explorer (FUSE) spectrograph as measured during alignment and characterization of the instrument. The measured performance including resolution, efficiency, and scattered light is discussed along with the various instrumental effects contributing to the final performance characteristics.

Finally, we present the laboratory spectra of N₂, CO, O₂, H₂, Ar, and Pt/Ne at 30,000 resolution between 900Å and 1150Å as obtained with the spectrograph. These data are extremely interesting in and of themselves and demonstrate how powerful an astronomical instrument the FUSE instrument will be once in orbit.

128.04

The Laser Metrology System of the Navy Prototype Optical Interferometer

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The Navy Prototype Optical Interferometer (NPOI) employs an extensive laser metrology system to monitor baseline motions for wide-angle differential astrometry. For 1-2 mas astrometric precision, the metrology system must monitor the baselines with a precision of approximately 100 nm. The hardware is described, as well as the mathematical formalisms and data-reduction software philosophy.

128.05

"GoldHelox": A Robotic Soft X-Ray Solar Telescope

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NASA G-133, also known as the "GoldHelox" Project, is a robotic soft x-ray telescope to be flown aboard a NASA space shuttle. An alternating layer of molybdenum and silicon, multi-layered, mirrors are used in conjunction with a micro-channel plate (MCP) detector. The telescope will take 300 full disk images of the sun with a spatial resolution of 2.5' and a temporal resolution of one second. The x-ray wavelengths to be imaged are 171Å to 181Å corresponding to the highly ionized Fe IX, Fe X, Fe XI lines. These data will contribute to an understanding of four questions: (1) What is the structure of solar flares when they are beginning to form? (2) What mechanisms causes the initial energy release in a solar flare? (3) What is the relationship between coronal mass ejections, microflares, and the high resolution upper transition region magnetic structures? (4) How does the transition region between the corona and chromosphere respond to the impulse phase of flares?

128.06

The Advanced Camera for Surveys

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The Advanced Camera for Surveys (ACS) is to be installed in the Hubble Space Telescope (HST) during the third HST servicing mission in December 1999. The ACS comprises three cameras each designed to achieve specific goals. The first, the Wide Field Camera, will be a high throughput, wide field

(200" x 204"), visible to nar-IR camera that is half critically sampled at 500 nm. The second, the High Resolution Camera (HRC), is critically sampled at 500 nm, and has a 26" x 29" field of view. The HRC optical path includes a coronagraph which will improve the HST's contrast near bright objects by a factor of 10. The third camera is a far ultraviolet, Solar-Blind Camera (SB-C), with a field of 26" x 29". ACS will increase HST's capability for imaging surveys and discovery by at least a factor of 10. We give an overview of the ACS design and discuss the quality of the optics and the performance of the CCD and MAMA detectors. The plans for the GTO science program are reviewed, and specific scientific capabilities of the instrument reviewed.

128.07

The Improved Resolution and Image Separation (IRIS) Satellite: Astronomical Observations With a Large Occulting Satellite

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Natural occultations and coronagraphs have been used to study sources with high brightness contrasts. However a large schedulable occulting satellite would have benefits over either, and could compliment other proposed technologies for planet detection, in particular advanced adaptive optics systems and stellar coronagraphs. Such a satellite could also be used to achieve milli-arcsecond resolution of bright compound sources, such as microlensed images of Galactic and LMC giants, binary stars, nearby clusters, etc. Finally, using tomographic reconstruction techniques, it could be used to image solar system bodies, and other resolvable sources, down to few milli-arcsecond scales. The Improved Resolution and Image Separation Satellite (IRIS), could operate conjunction with ground-based telescopes in an eccentric high-apogee Earth orbit, allowing optimal utilization of continued improvements in adaptive optics and other telescope and detector technologies. Alternatively, it could be placed in orbit at the L2 point of the Earth's orbit together with a 1-2m class telescope, affording improved seeing and possibly simplified orbital dynamics. In Earth orbit, careful selection of orbital parameters to produce velocity matching between the satellite and the ground-based observer, allow occultation events to last up to 2400 seconds, with over 90% of the sky accessible with integrations longer than 400s for most major telescope locations (e.g. Hawaii, Chile). Even longer integrations can be achieved at the L2 point with station-keeping.

128.08

The IUE Final Archive: Analysis of the White Dwarf SWP Echelle Spectra

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During its 18.5 years of operation, IUE obtained SWP echelle spectra of some 56 hot degenerate stars, including hydrogen-rich DA, helium-rich DO and hybrid DAO white dwarfs. Present in many of these spectra are narrow interstellar-like features arising from a wide variety of high Z ions. The analysis of these features is providing new insights into the composition of white dwarf photospheres, the nature of the immediate circumstellar environments of these stars, and the local interstellar medium. Results from a systematic analysis over 200 NEWSIPS versions of these spectra, including high quality coadded data sets, are presented. These include examples where improved spectral signal-to-noise has made possible the identification of many weak features not previously apparent in a number of stars. A detailed examination of the SWP NEWSIPS echelle wavelength scale and flux uncertainty vector will also be presented.

128.09

Far Ultraviolet Imaging Sky Surveys with the GIMI Instrument on the ARGOS Satellite

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The Global Imaging Monitor of the Ionosphere (GIMI) is one of nine scientific instruments aboard the Advanced Research and Global Observation Satellite (ARGOS) to be launched into polar orbit in early 1998. As its name implies, the primary objective of GIMI is remote sensing of the ionosphere and upper neutral atmosphere, through imaging of airglow emissions