

LATEST NEWS ON INSTRUMENTATION... LATEST NEWS

CFHT TV PHOTON-COUNTING SYSTEM

The TV Photon-Counting electronics and the cooling subsystem have been tested in the laboratory at Waimea and at the summit, during May of this year.

As a result of these tests as well as sky tests done at l'Observatoire de Haute Provence (OHP) and the CFH telescope during the last three years, we now have a very high degree of confidence that the instrument will meet our expectations.

The TV Photon-Counting Camera will be used as a detector for the CASSHAWEC spectrograph in November. This will be the first time it will be connected to the CFHT data acquisition system. The software has been developed at CFH and it is now integrated into our DIALOG system permitting access to the Cassegrain Bonnette and telescope control system commands.

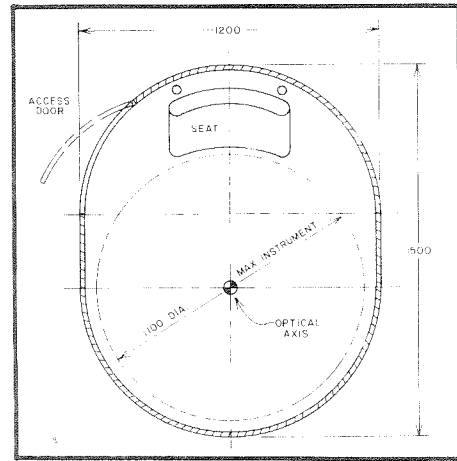
For the visualization of the integrated image, a Péricolor image processing system is used. Image analysis can be done either by using the set of functions provided by the Péricolor or by using an image analysis software package developed at OHP. The temporal image as well as single events can be acquired simultaneously with the integrated image that is continuously displayed by the Péricolor and recorded on magnetic tape for further reduction. This feature permits the use of the camera with the Fabry-Pérot interferometer, enabling one to record on magnetic tape the different channels selected. Because of the limitations of the Péricolor memory, only three integrated images corresponding to three Fabry-Pérot user-selected channels can be displayed at any given time when monitoring the observation.

NEW PRIME-FOCUS CAGE

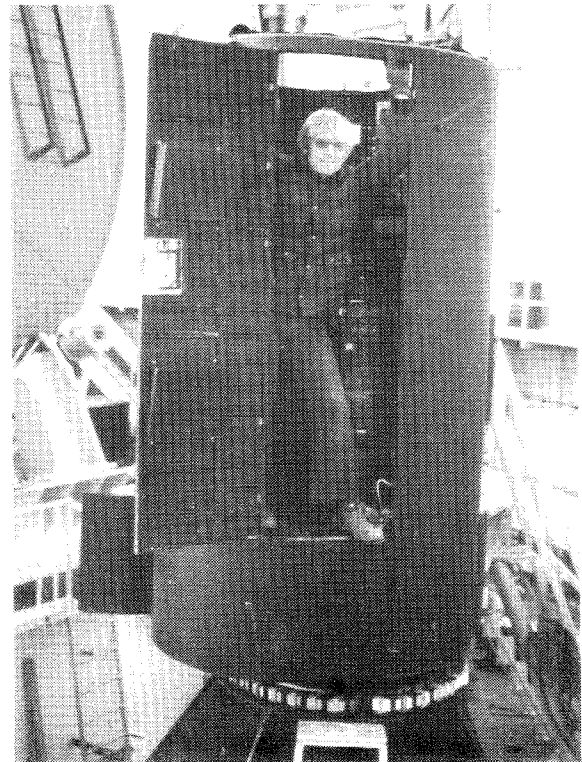
On Friday the 13th (!), of April 1984, the prime focus (PF) top end with its new cage was put into operation.

To minimize light losses, the original cage consisted of a cylinder with an extendible section. The projected area of the cage with the observer section extended was 1.487 m^2 ; for remote observing, the projected area of the cylinder was 1.131 m^2 . Unfortunately, the closed configuration was too small to accommodate the bonnette, auxiliary electronics and detectors, and more specifically, the CCD and Electronographic Camera. Thus, the cage had to be used permanently in the open configuration. Even so, it was not possible to rotate instruments remotely without the risk of interference and damage to either the instrument or cage.

In 1983 a new cage was designed; its projected area is 1.491 m^2 , which corresponds to 0.3% additional light losses compared to the extended version of the original cage.



The new cage (schematic is shown above) accommodates the bonnette and all PF instruments without any restriction. Furthermore, it features completely redesigned functional electronic panels, arranged in a series of UNISTRUT channels spaced 10 cm apart. This allows fastening of small auxiliary equipment and electronics. In addition, larger, heavier equipment and CAMACs mounted on 19" standard panels can be attached to any of six racks installed under the cage's removable flooring through access doors on the sides. The new cage (shown in photograph below) is 300 kg lighter than the original one; this makes it possible to maintain compatibility with the Cassegrain and Infrared top ends. The familiar orange-crate seat is still in use, but with more input from users, a permanent observer seat design will be finalized; we hope that it will be built and installed in the near future.



ON INSTRUMENTATION -- LATEST NEWS ON INSTRU

FIRST ACCEPTANCE TESTS FOR SPECTROGRAPH #2

The Long Slit-Cassegrain Spectrograph (CASSHAWEC) underwent phase I of a two-part series of formal acceptance and engineering tests in June 1984. This was carried out by D. Salmon, P. Wizinowich and D. Harduin, with astronomical data from observations by G. Lelièvre.

Prior to the tests, the INAG team headed by André Baranne again spent many weeks of tireless effort finalizing the alignment of the internal optics in order to bring the spectrographs to peak performance. It is a pleasure to see a contractor extend such continuing efforts in order to deliver a truly finalized instrument to CFHT.

Actually, when speaking of Spectrograph #2 we should remember that it is really two complete and separate spectrographs (channels) sharing a common mechanical housing. The blue spectrograph is intended for the 3000 Å to 5000 Å domain, while the red spectrograph covers the region from 4800 Å to 1.0 μm.

Phase I tests were intended to test the quality of the electro-mechanical functions, the spectral line widths, image stability and the efficiency of the spectrographs. Extensive testing and exercising of 43 of the 50 spectrograph functions - mostly motorized and encoded - demonstrated no fundamental problems. A few inconsistencies with encoders and travel limits appeared but these should easily be fixed in time for the phase II tests in November.

Spectral line widths and line shifts caused by telescope motion are summarized in Tables I and II below. Line widths are generally as good as or better than the 20 μm requirement in the technical specifications, except at the long-wavelength end for the blue spectrograph. Line shifts induced by telescope motions between the vertical and zenith distance of 60° are similarly close to the 2 μm/hr (8 μm total) specification.

Table I. Spectral Line Widths

Channel	central λ	line width (μm)		
		blue	center	red
Blue	3300	-	16	20
	4000	16	18	26
	4700	16	20	-
Red	6600	20	20	-

Table II. Spectral Line Shifts for a 60° change in zenith distance

Channel	mean abs. value	worst case
Blue	4.6 μm	19 μm
Red	6.9 μm	11 μm

Probably of more general interest are the calculations of spectrograph efficiency. Unfortunately good data were obtained only for the blue spectrograph, although reasonably reliable Reticon count rates are available for both instruments using a 1.5 arc-sec slit. The efficiency data for the blue spectrograph taken from Reticon spectra of γ Oph are listed in Table III; provisional Reticon count rates are given in Table IV.

Table III. Blue spectrograph efficiency

λ	efficiency
3500	25%
4000	30%
4500	19%
5000	21%

Table IV. Provisional Reticon count rates

Channel	λ	ADCU/sec @ 0.0 mag.
Blue	4550	15.2 x 10 ³
Red	6220	45.8 x 10 ³
	8600	28.2 x 10 ³
	10,000	10.4 x 10 ³

Spectrum of γ Oph centered at 4000 Å using the Blue train of Spectro #2

