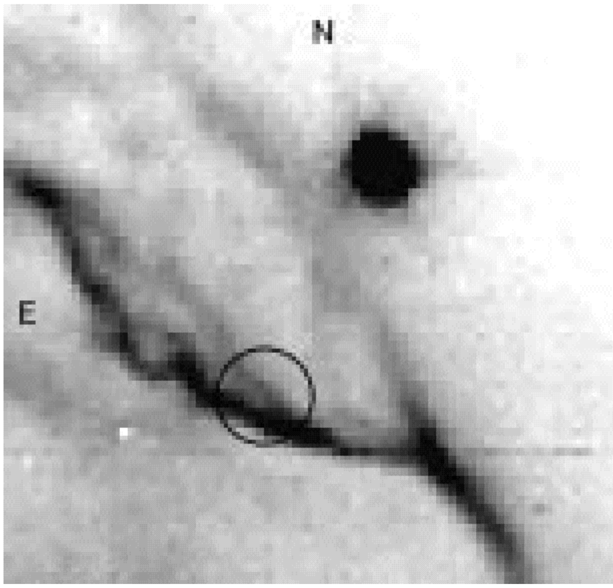


**Figure 2**: A grey-scale image of part of the $H_2$ S(1) v=1-0 IR emission at 2.121 μm recorded in Lemaire et al, 1996. The circle of diameter 5 arcsec shows the position and extent of the region observed in the current work. The illuminating star, HD200775, lies 48 arcsec to the SE of the centre of the circle marked on the image. HD200775 itself lies at $\alpha(1950) = 21^h00^m59^s.7$, $\delta(1950) = 67^o57'55''.5$.

**Table 1**: Velocities in $v_{lsr}$ and widths for HI data (Fuente et al, 1996), $H_2$ (present work), CII, CI and CO (6-5, 3-2) emission data (Gerin et al, 1998) and $^{13}CO$ (1-0) emission data (Fuente et al, 1998. Linewidths in the second column are values at full-width-half-maximum.

| Species observed | Linewidth (/km $s^{-1}$) | Velocity (/km $s^{-1}$) |
|---|---|---|
| HI | 6 | 4 to 5 |
| $H_2$ | 3.4 | 3.75 +/– ~0.25 |
| CII | 3.4 | 2.8 +/– ~0.1 |
| CI | 1.2 | 2.25 +/– ~0.3 |
| $^{12}CO$(6-5) | 1.5 | 2.6 +/– ~0.3 |
| $^{13}CO$(3-2) | 0.6 | 2.5 +/– ~0.3 |
| $^{13}CO$(1-0) | --- | 1.9 +/– ~0.5 |

ever in good agreement with values reported elsewhere e.g. Martini et al, (1997).

The successes and failures of current models apart, our demonstration of relative flow requires a consideration of time-dependent effects within the PDR in NGC 7023. Advection of warm material (Hollenbach and Tielens 1999) from the outer part of the PDR into the cooler part, say, would increase the temperature deeper into the PDR over the value estimated purely from the atomic and molecular microphysics. The advection of irradiated material in the PDR has not been considered in models of a pure PDR.

In conclusion, it is evident that NGC 7023 is a dynamically interesting region. Both low and high resolution (R~25,000) data, obtained using the BEAR instrument on the CFHT, are presently being analyzed and promise to shed further light on the dynamics of NGC 7023 and introduce further constraints on PDR models.

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# CFHT News

## Director's Corner

### CFHT in the 21'st Century

***Greg Fahlman** - CFHT*

In the Semester 1994I issue of the CFHT Information Bulletin, Pierre Couturier very boldly listed seven priorities for the duration of his term as Executive Director. My scorecard reads 5.5/7.0, with some progress in all areas. This is a remarkable record and leaves a solid foundation for the future. Many elements of the program initiated by Pierre will be continued. In particular, the search for increased operational efficiencies and improvements in the reliability of the Observatory instruments and telescope subsystems. The quality of support services offered to observers will continue to be enhanced both on and off the telescope. The need for an on-going preventitive maintenance program was highlighted in the report of Advisory Committee and work toward implementing this will be undertaken.

The chief instrumental goals ahead include:

- Finishing the work on CFH12K so as to provide fully functional, reliable operation with well characterized photometric properties. This instrument is already the dark-time workhorse at CFHT and will serve as the vehicle for introducing queue scheduling at CFHT.
- Completing the remaining elements of the Wide Field Imaging Plan (WFIP), including CFHT-IR: a 1k x 1k camera with a 3.5 arcmin field-of-view for imaging and to be used with OSIS-IR for spectroscopy.
- MEGAPRIME: This ambitious project is well underway toward meeting the goal of being on the sky in approximately 2 years from now. This instrument is the key element of the WFIP and is expected to ensure an uniquely competitive role for CFHT, as a wide field survey facility, up to approximately the year 2006.
- Finding the means whereby CFHT can offer wide-field IR imaging to our observing communities. Although a potential source for partial funding of the WIRCAM project has been identified (through the sale of telescope time), further effort, and possibly sacrifice, will be needed if we are to provide this instrument for CFHT users.

In addition to the above, over the next few years CFHT will continue to respond to community needs, as prioritized by SAC, for upgrades to existing instruments and for new guest/visitor instruments. Such developments, however, need to occur in the context of the demands placed upon the CFHT staff by their increased level of involvement in our major instruments, as well as the possibility of a finite horizon for the present configuration of CFHT.

MEGAPRIME was developed to be a survey tool. In recognition of this, the Agencies have set aside a block of time, a minimum of 6 weeks per year, exclusively for surveys. The allocation of this time will be in the hands of a survey working group as detailed in the May 99 SAC report. This new method of allocating time can be viewed as a harbinger of block-scheduling, an operational mode in which the instrumental configuration of the telescope is fixed in advance of the call for proposals. The predictability inherent to this mode is an attractive feature for streamlining operations and will be examined further.

However, our principal operational goal in the short term is to implement queue scheduling and service observing (QS/SO). When available, no later than semester 2000II for CFH12K, this will signal a watershed in the development of CFHT. The arrival of QS/SO will lead to an inevitable shift away from technically oriented operational priorities toward more emphasis on scientific values and more involvement of the Observatory personnel in the research carried out at CFHT. Clearly, QS/SO is expected to be extended to other instruments as required.

In spite of a fairly lengthy history, QS/SO has been slow to arrive. Why? Well, QS/SO presents a number of profound challenges to the CFHT. It must be thought of as an end-to-end process, starting with the submission of proposals, followed by evaluation and scheduling, to the key element of obtaining high quality data, and finishing with the distribution of data products to the interested parties; the PI's of course, but also the data processing and data archive centers. Each stage in the process contains some novel features compared to our traditional "do-it-yourself" mode of operation.

In addition to the technical issues, most of which have been dealt with in other contexts at other observatories, there are structural problems arising from the fact that this new mode is being retro-fitted to a 20 year old observatory with well tested operational procedures that ensure the health and safety of the equipment and personnel. Hence, all parts of this process need to be thoroughly examined to ensure the safe and reliable operation of QS/SO on a routine basis. Not the least issue is that QS/SO will require some new funding sources for implementation.

There is then a long list of issues to be dealt with but, fortunately, there is much in place to build upon. Our approach will regard the QS/SO as another observer, albeit one with some special needs, so that the overall process can be focussed onto smaller projects that will, for the most part, also enhance the efficiency of traditional observers. The cooperation of the observing community, via paperless proposal submission is a key ingredient. New formal arrangements between the CFHT staff, the agency TACs and the CADC are needed.

*Long Term Plan:*

The most prescient commentary in Pierre's introductory essay was a section also called, Long Term Plan. There is little that I can add to his remarks as he had correctly anticipated the problems posed by the then incipient arrival of the 8m-class era. Unfortunately, it is the one area where the least amount progress is evident.

In the meantime, the French community has held a prospective meeting at Arcachon (1998), the Canadian Long Term Planning Panel (LRPP) has delivered a draft report (1999) and the CFHT Board has received a report from an ad hoc New Generation CFHT (NGC) committee. For different reasons, none of these documents provide a clear vision for the future of CFHT beyond the 2006 horizon. In each case, however, there is a strategic long term vision involving participation in a very large optical telescope (VLOT). Perhaps the most difficult aspect about addressing the future of CFHT is the different status among the partner communities with respect to access and resource commitment to 8m-class telescopes. This divergence is clearly apparent in the Arcachon and LRPP reports and is an obvious reality for the UH community. Moreover, although there is a consensus view in the CFHT community (expressed in the NGC Report) that the next major step in ground-based Optical-IR astronomy is a 25m-class instrument (or larger), to date, the development is being led by the major 8m-consortia: in particular ESO in Europe and Gemini elsewhere (primarily North America). The role, if any, to be played by CFHT as an Observatory in these developmental efforts needs to be assessed, internally and externally. On the positive side, all partners recognize that CFHT sits on the best location on the best site in the world for ground-based Optical-IR Astronomy. The partner communities have a rich scientific heritage and developed strong, creative technical infrastructure that has produced world-leading instrumentation. CFHT is a vital part of our community resources today and can continue to be so for quite some time to come.

The challenge is to build upon the common ground in a way that sustains the vitality of the CFHT as an Observatory, and as a partnership, while the vision of a VLOT (in whatever guise) takes shape.

The deployment of a VLOT now sits on a distant horizon, beyond 2015. International interest in this project appears to be growing within both the scientific and industrial sectors. However, a more rapid development may bring the VLOT project into competition with other large scale international astronomy projects, as well as affecting the exploitation of the current 8m-class facilities. This distant horizon presents CFHT with a lengthy gap between the end of the initial MEGAPRIME survey era and the VLOT era.

The task ahead then is to develop realistic scenarios for the continued operation of CFHT as a 4m-class facility potentially for another decade or more. In this scenario, Pierre Couturier's vision of a operating CFHT as a component within a community of specialized 4m-class facilities retains considerable appeal. Some effort will be directed toward realizing this goal. We will also be examining carefully the prospects for upgrading the telescope to a larger aperture, either with a standard design or perhaps something more specialized that fits into the bigger picture around the VLOT. An upgrade along these lines is certain to require a new, expanded partnership. Again, the identification of potential partners will become a part of the ongoing strategy for defining the future of CFHT.

## MegaPrime: T – 2 years

***Christian Veillet*** - CFHT

Now that CFH12K is operational, MegaPrime is CFHT first priority project and resources have been allocated to the various tasks which are CFHT responsibility. Meanwhile, the other institutes collaborating to the project continued their work. Two important meetings took place at CFHT this semester. One has been devoted to the definition of the mechanical interfaces (with CEA, NRC and CFHT), and the second one allowed to define the software interfaces between the camera and the CFHT acquisition system. Here are the last news on MegaPrime as on mid-July 1999:

- The new upper end of the telescope is being designed at CFHT with some help from INSU/DT in Paris. The whole design should be completed by the end of this year. Contacts have been made with a company on the mainland for the fabrication of the upper end. Delivery is planned for the second semester of 2000. In parallel, the routing of the cables and hoses will be prepared at CFHT together with the cooling system of the new upper end (based on glycol lines).
- The last three blanks for the wide field corrector are fabricated. The first lens blank (80 cm diameter in BSL7Y) seems to be a challenge for the company which is making it. We hope to have that blank by the end of November. Four companies made an offer for fabricating the lenses. They received a call for bids for the fabrication of the wide field corrector structure. Bids are due by the end of August.
- The Image Stabilizing Unit went through its Final Design Review in July, and will go to fabrication soon. Acceptance tests are planned for April 2000 at Observatoire de Paris (P. Gigan).
- The Focus Stage Assembly and the Guider and Focus Sensor Unit are developed by NRC in Victoria (known to oldies as DAO...). Their control is now handled by CFHT (reducing the MegaPrime related work load at NRC). Final design reviews should take place in November. Acceptance tests in Victoria are planned for July 2000.
- MegaCam, the camera with its shutter and filter jukebox, is in development at CEA. The Final Design Review is scheduled for November. The acceptance tests at CEA should take place in January 2001.
- The CCDs are arriving regularly for tests at CEA. 6 have been accepted and 3 are being tested after the first six months of the contract with EEV which is late by 3 devices.
- Large interference filters of the size required for MegaPrime (35 cm x 30 cm) are very difficult to make. None of the companies usually providing filters for astronomical use is ready to build them. The filters could be made of a single piece, or could be a mosaic of smaller filters. The various ways are being explored, and a consortium could be organized soon, gathering the various projects which are in need of big filters...

Integration of the new upper end (but the camera) is scheduled for the end of 2000 and the beginning of 2001. First light of the camera is scheduled for May 2001.

## CFHT-IR: A new infrared camera for CFHT

***Jean-Luc Beuzit*** - CFHT

CFHT-IR is a new general purpose 1024 x 1024 near-infrared camera designed to replace Redeye for both direct imaging at the F/8 Cassegrain focus and multi-object spectroscopy with OSIS. CFHT-IR is currently being developed as a collaborative effort between Université de Montréal and CFHT and is expected to be available to observers starting with semester 2000II. The new camera is based on the 1K x 1K Rockwell Science Center HAWAII (HgCdTe Astronomical Wide Area Infrared Imaging) focal plane array and includes a cryostat with 7 cold lenses, 2 7-position filter wheels and a pupil mask. The excellent optical and throughput performances of the instrument promise to greatly enhance the near-infrared imaging and spectroscopic capabilities of CFHT. The main characteristics of the CFHT-IR camera are summarized in Table 1.

**Table 1:** CFHT-IR main characteristics

| | |
|---|---|
| Detector format | 1024 x 1024 |
| Detector material | HgCdTe |
| Spectral range | 0.75- 2.40 µm for imaging mode |
| | 1.10 - 1.80 µm for spectro mode |
| Operating temperature | 77 K |
| Readout noise | < 15 e- (goal) |
| Dark current | < 0.15 e-/sec |
| Full well capacity | 110000 e- |

**Table 1:** CFHT-IR main characteristics

| | |
|---|---|
| Mean QE (detector) | 65 % |
| Minimum integr. time | 0.1s |
| Maximum integr. time | 1 hour |
| Readout time (full fr.) | 3s (goal) |
| Plate scale | 0.211”/pixel |
| Total field-of-view | 3.6’ x 3.6’ |

## Opto-mechanical design

Two different observing configurations will be available:

- direct imaging at the F/8 Cassegrain focus between 0.75 and 2.40 mm
- multi-object spectroscopy with OSIS between 1.10 and 1.80 mm

The same pixel scale of 0.211”/pixel is used for both configurations, leading to a total field-of-view of 3.6’ x 3.6’ on the sky. The second configuration requires a modification of the OSIS optics in order to deliver a telecentric F/8 beam. This is achieved by replacing the last meniscus lens in OSIS by a CaF2 doublet.

Two filter wheels are included in the cryostat, each of them harboring 7 filters. Filters identical to the KIR ones are available for imaging (Tables 2 and 3). For the spectroscopic mode, the 3 filters previously available for Redeye on OSIS will still be used (Table 4).

**Table 2:** CFHT-IR broad-band filters

| *Filter* | *$l_0$ (mm)* | *Dl (mm)* | *Peak T (%)* |
|---|---|---|---|
| I | 0.834 | 0.194 | > 80 |
| J | 1.245 | 0.163 | 90 |
| H | 1.635 | 0.296 | 88 |
| K | 2.200 | 0.336 | 96 |
| K’ | 2.120 | 0.340 | 97 |

**Table 3:** CFHT-IR narrow-band filters

| *Filter* | *$l_0$ (mm)* | *Dl (mm)* | *Peak T (%)* |
|---|---|---|---|
| HeI_1 | 1.083 | 0.010 | > 60 |
| Paγ | 1.094 | 0.011 | 90 |
| J continuum | 1.207 | 0.015 | 70 |
| O II | 1.237 | 0.012 | 86 |
| Paβ | 1.282 | 0.012 | > 60 |
| H continuum | 1.570 | 0.020 | 67 |
| FeII | 1.644 | 0.015 | 70 |
| FeII continuum | 1.690 | 0.018 | 70 |
| H2 (1-0) | 2.122 | 0.020 | 65 |
| Brγ | 2.166 | 0.020 | 72 |
| H2 (2-1) | 2.248 | 0.020 | 68 |
| K continuum | 2.260 | 0.060 | 85 |
| CO (2-0) | 2.296 | 0.020 | 73 |

**Table 4:** CFHT-IR spectroscopic filters

| *Filter* | *l0 (mm)* | *Dl (mm)* | *Peak T (%)* |
|---|---|---|---|
| J + H | 1.440 | 0.945 | 94 |
| C1.6 | 1.357 | 0.476 | 96 |
| C1.7 | 1.412 | 0.590 | 88 |

## Acquisition system and user interface

CFHT-IR will be driven by a second generation San Diego State University (SDSU) CCD controller, which has been selected as the new controller for visible and infrared detectors at CFHT (CFH12K, EEV, etc.), and a 4-channel pre-amplifier mounted on the dewar. The total detector readout and delivery time is expected to be of the order of 3 seconds with the second generation SDSU controller.

The observing sessions will provide the observer with an user interface identical to the KIR one, called DetI, incorporated into the CFHT/Pegasus observing environment, through which they will configure the camera, control the data acquisition, monitor the data storage and do some pre-processing. Commands can be issued either from a GUI form or at the command line level, the latter feature allowing relatively complex sequences of observations, such as dithering and mosaics, to be prepared in advance using C-shell scripts.

For more information and recent updades on KIR (project status, availability, expected performances, etc.), please take a look at our web site (http://www.cfht.hawaii.edu/Instruments/Detectors/IR/CFHT-IR/) or contact Jean-Luc Beuzit (beuzit@cfht.hawaii.edu).

# A new detector for Gecko

***Jamey Eriksen** - CFHT*

The CCD camera EEV2, a EEV 42-90 type device was successfully installed onto the Gecko spectrograph for the run starting May 24, 1999. The device is a 2048 x 4608 pixel array and was purchased in 1998. It was known to have poor serial charge transfer efficiency before it was purchased. It was believed it would work fine in the Gecko environment even with poor CTE (Which it does). EEV2 was characterized in the Waimea CCD Lab in the weeks before the installation at the observatory.

The performance numbers for the right amplifier (the left amplifiers wasn't fully characterized) are:

gain: 1.339 electrons/ADU
noise: 3.99 electrons
fullwell: 83,000 electrons

Linearity: < 0.5% over fullwell

CTE:

Parallel >0.99999

Serial 0.99995

Since the Gecko region of interest is only 250 columns wide the poor serial CTE isn't a major problem. From x-ray tests of the CCD it was determined that you will lose 20 electrons due to the poor CTE over the small Gecko region. It should be noted that the poor CTE will keep this device from being used in a full frame imaging mode. Over the full frame you lose fully 110 electrons over the entire array.

EEV2 has very good quantum efficiency, as illustrated in this table:

**Table 1:** Quantum efficiency of the EEV device

| Wavelength (nm) | 350 | 400 | 500 | 650 | 900 | 1000 |
|---|---|---|---|---|---|---|
| QE (%) | 49.6 | 86.2 | 96.9 | 88.5 | 40.2 | 5.4 |

These values are better than the other EEV device we have in hand which is due for installation in a dewar later this year.

The cosmetics of the array are also very good. There is only one set of four columns that are bad. The dark current rate of the array is also very good, it is estimated to be < 2 electrons/hr/pixel.

EEV2 was installed in the Gecko spectrograph with a minimal of fuss due to the excellent work of those involved. Many thanks to those who were enlisted to help: Wiley Knight, Jeff Ward, Grant Matsushige, Todd Szarland, Les Mizuba, Bobby Song and Sidik Isani.

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## The Gumball Database: A new tool for CFHT users

***Pierre Martin** - CFHT*

With the development of the upgraded calibration system for the Cassegrain environment ("Gumball") last year, it became clear that a database of reference spectra should also be made available to the CFHT users. The upgraded Gumball is now fully operational and offers more options than the older system so there are now many more possibilities to obtain good calibration frames for the science observations. The Gumball system is also operated from a new Tcl/Tk interface fully integrated in the Pegasus session for all instruments using the Cassegrain focus (Figure 1).

The Gumball database, available on-line, represents a first step to help the observers in planning and carrying out the relevant calibrations. It is also very useful during the subsequent data reduction steps. The database has been extensively used already by many CFHT observers and even by several people not related to CFHT at all!


**Figure 1:** The new Gumball interface in Pegasus allows more possibilities for the observers to obtain calibration frames. The "timing off" option corresponds to the old system where the exposure time for the calibration frame is fixed by the time selected for the CCD shutter (from the "expose" form). The "timing on" option offers the possibility to give individual exposure times for the different spectral sources. This allows much more flexibility in avoiding saturation of the bright lines while keeping the exposure time long enough to detect the fainter lines.

At this moment, the database includes spectra for many configurations in MOS and OSIS-V (see Figure 2). Other instruments and configurations will be added in a near future. For each spectrum, the integration times, the average dispersion measured and some other details are given so the observers can use these data as a reference during their observations. The database includes also the complete list of spectral lines of the Gumball sources which is also very useful for planning calibrations well in advance of an observing run.

The Gumball Web page presents a manual describing the new system and how to use it. As described in this manual, the Fabry-Perot etalons included in Gumball are working. However, the wavelength calibration can be tricky and we do not have much details on the behavior of these sources yet. The channelled spectra resulting for the FP etalons have been examined at high-resolution with Gecko and will be used for some OASIS configurations. For MOS/OSIS, the etalons can also be used but other spectral calibrations obtained with the other lamps must also be carried out to obtain an absolute reference frame. Due to some mechanical constraints, the Helium lamp is not a standard spectral source in Gumball anymore and has been replaced by a Mercury-Argon lamp. If the Helium lamp is absolutely necessary for your observing run, you must indicate so in the pre-run preparation form available on the CFHT web site..

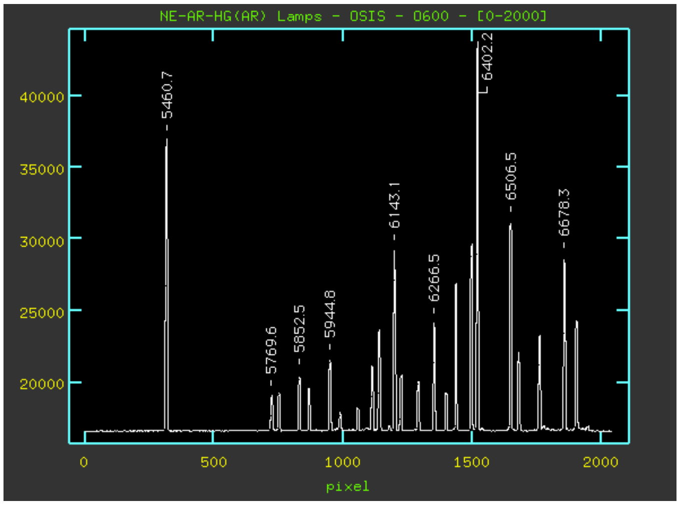


Figure 2: Example of a reference spectrum that can be found in the Gumball database. The main spectral lines are identified and other details related to this calibration frame and specific cuts are given in the main page.

The Gumball page and the links to the manual and the database can be found at http://www.cfht.hawaii.edu/Instruments/Gumball/. Comments and suggestions are mostly welcome!

## TCSIV - Status Report

***Bill Cruise*** *- CFHT*

TCS IV has been running in an early release state since the first week in February. Since its release many minor and a few significant fixes and improvements have been made. The system functionality has been greatly improved. In this time the system has been down only one night, and this occurred in May. The problem was due to a change in the control bus hardware, and was corrected the next day by adjusting the timing in the software buss driver.

Presently the system is being used for all observations. It is still missing a few key features, which can cause some loss of observational efficiency:

- no planetary, lunar, or solar ephemerids
- no PPM or cross referenced star catalog

We still have problems in some areas, but these are being investigated and slowly corrected:

- difficult to return exactly for repeat observations
- system position display is not always accurate
- system not logging enough information
- there is a known Y2K bug which must be exorcized

There are still a few major tasks to be undertaken:

- move cassegrain and prime focus bonnette control from HP 1000 computers into TCS IV real time box
- move dome control to TCS IV
- provide balance control
- implement TPOINT pointing modelling
- improve guider performance and control

Altogether I would say the system has been a success. It has been well accepted by the operators and observers alike. When working outside of the above, known constraints, it is a very efficient and easy to operate system. Hopefully it will soon become a complete system which achieves its goals.

*TCS IV Object lists*

While we have not yet implemented automatic object list input from observers, it is very easy to get your coordinate lists into the new system. Just send the lists, in the format below, to your support astronomer, and we will have them on line for the observing assistant. Lists may be maintained for later use, or removed by asking the observing assistant at the end of the run.

In addition to advance entry, the observers now have on line access to their coordinate lists while at the observatory. We plan to come up with a Web based system for handling object lists in the near future.

Object list format:

n hh:mm:ss.ss dd:mm:ss.s eq “name” [pmra pmdec]

A list should be one object per line. Items may be separated by spaces or tabs. The name field should be delimited by double quotes. The first item, ‘n’, is an arbitrary object number, and is required. Proper motion entries are optional.

## CFHT’s “NEO” Software

The software effort sometimes referred to as the ‘‘lost generation’’ at CFHT has found itself a new definition, a new name, and new life. The NEO team [*] (**N**ew **E**nvironment for **O**bserving) is charged with redesigning the data acquisition environment “Pegasus”, which has served CFHT over the last decade. They will create a system that supports CFHT’s future instruments and cameras with modern modes of observing. The new requirements of wide-field imaging are a driving force. Emphasis will be placed on promoting efficient science.

It will be CFHT's goal to provide a streamlined software environment that begins with proposals and ends with delivered, pre-reduced data. This, however, is not the scope of the NEO project. Software components directly involved in the data acquisition phase (taking pictures with the telescope) are the focus of this project. Reliability is critical in this phase, so simple solutions that meet scientific requirements and maximize output will be favored. Simple modular solutions are also adaptable to changing or developing requirements that are common with new instruments.

Software for run preparation, queue scheduling, and post-run data preprocessing pipeline will use hooks and protocols defined by NEO, but will themselves be separate projects. NEO will not include these components, but will describe the interfaces needed to link them to the data acquisition phase. For an external pre-reduction component, this interface may be as simple as specifying that NEO generates FITS files and that the reducer program reads FITS. But in the case of a component like the queue scheduler, the interface could be more complex, involving a set of standard, high level commands to cause actions, and a database to retrieve statistics.

Presently, functional and scientific requirements are being formed by the group. Design reviews are expected to be completed by the new year. All aspects will be looked at, in a top down fashion. Realistically speaking, many of the constraints of the system are already known, and some possible solutions are already in use, with the CFH12K as a testbed.

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* The NEO project will involve the entire software group and all of the resident scientists, but the following staff will have a significant portion of their time devoted to the project: Jean-Charles Cuillandre (project scientist), Sidik Isani (project manager and engineer), Rosemary Alles, and Renaud Savalle.

## Comings and Goings

**Tim Abbott** departed CFHT in November to take an astronomer position with the Nordic Optical Telescope at La Palma, Canary Islands. Tim spent 3.5 years as the University of Hawaii resident astronomer and was responsible for all CCDs at CFHT. He also initiated the implementation of the queued scheduling/service observing mode with CFH12K, created the prototype for the new CFHT Web page, and was the editor for the Bulletin for several years. Thank you Tim and all the best!

**Timur Atilgan** has joined the MegaPrime Project in April to oversee the design and the construction of the new prime focus upper end structure. Timur will be at CFHT for two and half years. Aloha Timur!

**Christophe Berthod** spent two months working for the MegaPrime project, thanks to an agreement with Division Technique at INSU-Paris. He modeled the tube of our telescope, from the primary mirror to the present prime focus cage. Christophe will be back in the Fall for two more months, adding that time to the tube the new megaprime upper end.

**Robert Calder** arrived in September 1998 to become the head of the electronics group. Bob is coming from USNO and has also worked in three other different observatories prior to this position. His vast experience, energy and enthusiasm are already very much appreciated at CFHT. Only after a few weeks here, his knowledge of our systems and instruments was already quite impressive. Welcome to CFHT Bob!

**Stephane Charpinet** arrived in October as a French cooperant. Stephane has recently obtained his Ph.D on the pulsations of sdB stars from the University of Montreal (and earned the prestigious CASCA Plaskett Medal award for it!). He is presently supporting Gecko and La Poune. Happy surfing Steph!

**Pierre Couturier**, our valiant Executive Director for the last six years, has left CFHT this July to become the President of the Observatoire de Paris. The entire Bulletin is way too short to mention all his contributions to CFHT so we'll just say this: MERCI ENORMEMENT PIERRE POUR TES EFFORTS INFATIGUABLES LORS DE CES SIX FRUCTUEUSES ANNEES AU TCFH!

**Jamey Eriksen** joined the electronics group in early February. Jamey had been working for five years with Bob Leach's group at San Diego State University where he assembled and tested detector systems. At CFHT, Jamey will be testing all our detectors, including the new EEV devices for Gecko, MOS and OASIS. Welcome to Hawaii!

**Greg Fahlman** has joined CFHT at the end of June as the new Executive Director. Greg is a Professor at the University of British Columbia in Canada and has been a very active observer at CFHT for almost twenty years. He has also been involved in diverse committees related to CFHT, among them the Board of Directors. The staff is looking forward to work with you Greg and welcome to the Big Island!

**William Luciani** has recently joined joined the CFHT staff at the summit facility manager. William was the electrical maintenance supervisor for the tunnel boring for the Los Angeles Metro Rail Project. Welcome to Hawaii to you and your family!

**Nadine Manset** has recently arrived at CFHT at a Canadian resident astronomer. Nadine just finished her Ph. D project at the University of Montreal under the supervision of P. Bastien. She was deeply involved in the implementation of the polarimeter “La Belle et la Bête” used at the Mt Megantic. Among other things, she will be the instrument scientist for Gecko. Bienvenue au TCFH!!

**John McDonald** has arrived at CFHT in January to take a position of observing assistant. John has a lot of experience in telescope operations, data acquisition and reduction, and CCD detectors. His has also a deep knowledge of astronomy. Welcome to Hawaii!

**Dan McKenna** has left CFHT in December to take a position as an engineer for the Large Binocular Telescope project in Tucson, Arizona. Dan was a member of the electronics groups for 7 years and was in charge of the detector electronics and their characterization. Mahalo and good luck in Tucson Dan!

**Francois Ménard** has joined the scientific staff as a visiting astronomer. Francois obtained his Ph.D at the University of Montreal and has a permanent position at Grenoble Observatory. His main area of research is related to the physics of young stellar objects. Francois will help to support a few instruments at CFHT and is responsible for the seminars. Bienvenue au TCFH!!

**Nick Meheula** left CFHT in May to pursue a career as a partner with an industrial automations contractor. Nick was the Summit Operations

Manager for one year and was very successful in coordinating the efforts of the summit crew, notably during the failure of the RA gearbox last September, and also in improving the preventive maintenance and safety compliance of the whole facility. You'll be missed Nick and... the best of luck!

**Les Mizuba** has arrived as a summit electronics and detector technician last September. Les previously worked at Lam Research in California while he was testing fixtures for semiconductor wafer processing equipment. Les is originally from Hawaii so... Welcome back!

**William Rambold** has recently joined the elctronic group. William has been working at CFHT for several years, where among other things he actively participated in the implementation of OASIS, before taking a position at Gemini in Canada. Welcome back William!

**Slavek Rucinski** departed in December to take an astronomer position at the David Dunlap Observatory in Toronto. Slavek was a Canadian resident astronomer for 16 months and was the instrument scientist for Gecko. He was also responsible for the up going project of fiber-fed Gecko, co-editor of the last CFHT User's Meeting Proceedings, and a member of the Mauna Kea Site Monitoring Working Group. Slavek was also in charge of finding speakers to give seminars at CFHT. Have a good time in Toronto and many thanks!

**Renaud Savalle** has recently joined the software group as a programmer. Renaud is coming from INRIA in France and has a lot of experience in designing software for observational astronomy and database systems. He will be involved in the development of NEO and the queue scheduling program. Bienvenue au TCFH!

**John Seerveld** left CFHT in October to start a new position as an instrumentation engineer for Keck Observatories. John was a very appreciated member of the optics group for numerous years. He implemented LAMA, the mask-cutting machine for MOS/OSIS, and he was responsible for all the Fabry-Perot interferometric systems at CFH. Good luck John!

**Todd Szarlan** joined the optics group in March as an instrumentation specialist. Todd previously worked with Zygo as a field technician on their line of interferometers. And, he has already joined the “Big Motorcycles Club” of CFHT! Welcome Todd!

**Roger Uchima** has joined us last year as a mechanical technician with the summit daycrew. Roger (better known as "Yasu") is from the Big Island with prior experience as a mechanic servicing and operating heavy machinery. See you up there Yasu!

**Dan Wilcox** left the electronics group in May after nine years at CFHT. Over these years, Dan was heavily involved in a large number of projects, in particular the Cassegrain Bonnette, MOS/OSIS, "Gumball" calibration system and the CFH12K mosaic camera. Dan and his family are now pursuing a long time dream of sailing around the world. We'll see you there Dan and a big Mahalo!

## In the News...

- Starting on August 1st 1999, **Christian Veillet** will assume the role of Senior Resident Astronomer at CFHT.
- **Dennis Crabtree** will stay at CFHT for three months as a visiting astronomer until the end of October. Dennis will then assume the role of the Canadian coordinator for the Gemini telescopes, based at DAO in Victoria.
- **Eugene Magnier** from the University of Washington in Seattle will join the science staff at the UH resident astronomer in mid-September.
- **Olivier Lai** from Keck Observatory will be joining the CFHT as a French resident astronomer in October, in replacement of **Jean-Luc Beuzit** who will undertake a position at Grenoble Observatory later this year.
- An announcement of the new occupant in **Pierre Couturier**’s position as a French astronomer is expected shortly.
- As an effort from CFHT to increase its visibility around the world, a contract with **Alexandra Brett** from Dragonfly Communications in Canada has been signed. Alex is an expert in public relations and will help writing the annual report as well as preparing press releases and diverse articles aimed to the general public.

## Queue Scheduling And Service Observing With CFH12K

***Pierre Martin*** *- CFHT*

With the arrival of the new CFH12K mosaic camera, the CFHT users have now access to one of the most powerful instrument dedicated to wide-field imaging. It is imperative, however, that this instrument is used to maximize science productivity. In a classical observing mode, the highly-ranked programs are not always conducted during the weather conditions required to achieve the scientific goals whereas lower-ranked proposals might be completed in excellent weather. To address this problem, most of the large upcoming telescopes have developed the queue scheduling/service observing (QS/SO) concept. In QS/SO mode, the programs are executed according to the actual weather conditions and following a set of rules by the observatory staff. Last year, the CFHT Science Advisory Committee (SAC) has recommended to develop this concept for the CFH12K camera. Hopefully, QS/SO will become the “standard” mode of operation for CFHT in the mid-term future especially in the era of the Megaprime camera. Implementing QS/SO with CFH12K represents then the first step toward this operational model and a good opportunity to develop the expertise necessary to increase science productivity within the telescope time available.

### Queue Scheduling / Service Observing Principles

The concept of QS/SO mode with CFH12K has been presented in several documents available on the CFHT Web site. In summary, the QS/SO mode can be described as follows:

*1) Proposal Submission:*

The submission of proposals is done in two phases. Phase I is based on the current submission procedure employing “Poopsy” at CADC. Phase I is then used by the TAC to evaluate the science merit of the proposals and recommend the integration time (I-time) that should be allowed for a given program and for the QS/SO run. CFHT will provide an estimated efficiency for QS/SO, which allows for both weather and observing efficiency, to convert hours of telescope time into hours of I-time. All information related to the proposals is kept in a database and used as a further reference for the next submission step. Phase II addresses directly the information required for the queue execution (observing blocks). For Phase II, the investigators enter the details of their program through a set of Web forms and/or observing tools and this information is sent to a database at CFHT. Phase II forms are currently being developed by the CFHT staff.

*2) Queue Execution:*

Prior and during each observing night, a list of observing blocks is assembled to optimize science productivity according to the weather conditions and requested specifications. This list is extracted from the database using the scheduling software and the priority of each observing block is evaluated according to specific criteria. Dedicated and trained observers perform the observations, as well as any required calibrations. These observers use specific tools to access the image quality and other properties of the images (e.g. sky background). All these measurements are automatically included in the database for each observation block. The management of the queue (e.g. block completed, second execution) and all decisions related to the QS/SO run are made by one of the resident astronomers assigned as the queue coordinator.

*3) Data Reduction, Evaluation, Distribution and Archiving:*

The astronomical observations are automatically pre-reduced to remove instrumental signatures using a database of relevant calibration frames. A thorough data control quality evaluation is carried out on the data and the pre-reduced data by the queue coordinator. This step might be the more challenging aspect of the QS/SO mode with CFH12K since the amount data generated by the camera is well, ... astronomical! It is the main reason why the QS/SO mode was postponed to later next year (see below). The data reduction pipeline will be developed in parallel with the other components of the queue scheduling.

The astronomical data and relevant calibration frames are distributed to the investigators. At the moment, this data distribution and archiving process has not been fully defined.

**Time Schedule**

In the previous planning, all observations with CFH12K for 1999II would have been performed in a queued mode. However, following a review meeting at CFHT in April, the Executive of CFHT has decided to postpone the CFH12K QS/SO program. The main reason for this delay is the absence of available resources at CFHT at the moment to perform the observations and ensure an efficient data distribution. Other logistical issues (e.g. the “Two Person Rule” at the summit) and financial issues are being examined. The implementation of the QS/SO mode requires also considerable efforts of the software side (proposal submission, scheduler, database management S/W, etc.). We have already developed a set of prototype tools, taken actions concerning the observing room in Waimea (see below), the audio/video link, database machines etc. The QS/SO software will be developed in parallel with the NEO software which include the control of the intruments at CFHT in a broader scope. In this context, it has been decided that the QS/SO program with CFH12K will start at the semester 2000II.

More details on the progress of the QS/SO mode project is available at the CFHT Web site (http://www.cfht/hawaii/edu/Instruments/Queue).

## The Waimea observing facility: A CFHT project

***Pierre Martin*** *- CFHT*

As most CFHT observers have often experienced, observing at the summit of Mauna kea can be physically very difficult due to the altitude acclimatization. It is particularly true for the first night of an observing run when a slow adaptation often results in more frequent mistakes and a decrease in the observing efficiency. However, with the arrival of the fast network link between Waimea and the summit, it is now possible to conduct observations efficiently from the CFHT headquaters. It is particularly true for instruments not requiring frequent direct interventions like CFH12K, AOB or OASIS. The concept of remote observing from a Waimea facility has been developed at Keck Observatories in the last two years. This facility was so successful that about 90% of all the observations are now conducted from their remote control room. In general, observers find that it is much more comfortable and efficient to observe from Waimea.

In the last few months, CFHT has created a Working Group to evaluate the diverse issues related to the development of a similar facility in our headquarters. It was decided that a Waimea control room would be a major asset for CFHT observers and especially for the upcoming queue scheduling/service observing (QS/SO) mode with CFH12K and other instruments. The Working Group has identified an actual room at the headquarters that will be modified soon to create a suitable observing environment. This room will be furnished to include a console with the diverse terminals required for performing the observations, a remote video/audio link system, other equipments (e.g. PC, printer, copying machine) and some appliances. The full report of this Working group should be available very shortly on the CFHT Web site.

The Waimea observing room should be fully completed by the middle of the semester 1999II. It will be first used by the observers performing queued scheduled observations starting at the semester 2000II. This room could also be offered as an option for some observers in 2000I, if some logistical issues under studied at the moment can be solved (see below). We are expecting that this facility will become rapidly available to all observers in the middle of next year.

Some logistical issues related to such a facility must be solved before it can be offered to the general community. The most important ones are the ‘‘Two Person Rule’’ at the summit and the sleeping facilities for the observers. For obvious safety reasons, it is required that at least two persons are in the CFHT dome at all time. Taking out the observers from the summit to a Waimea control room will violate this rule. The CFHT Executive is exploring diverse alternatives to this rule with other observatories on Mauna Kea and a definitive solution should be found soon. At the moment, CFHT do not have satisfying sleeping facilities for the observers using a remote control room and the local hotels do not offer a good alternative. The Working group is working in finding solutions to this problem and as soon as one is identified, the remote control room will be offered to all observers.

The Waimea control room will be a very extensively used facility by the CFHT observers in the future and should result in an increase in efficiency, comfort and science productivity. More information will appear on the CFH Web site. Stay tuned!

## CFHT hosting ADASS '99 !

***Pierre Martin*** *- CFHT*

CFHT is delighted to announce that it will be hosting the Astronomical Data Analysis and Software Systems (ADASS) IX Conference to be held at the Hilton Waikoloa Village Hotel, October 3-6, 1999.

The ADASS Conference Series provides a forum for scientists and computer specialists concerned with algorithms, software and operating systems in the acquisition, reduction and analysis of astronomical data. The program includes invited talks, contributed papers, poster sessions, tutorials, and special interest meetings (''BOFs''). The proceedings of the conference will be published in the ASP Conference Series.

The following seven key topics have been identified by the Program Organizing Committee (POC) for the upcoming conference :

- Enabling Technologies for Astronomical research
- Scripting Languages
- Sky Surveys
- Software Developmental Methodologies
- Queue Scheduling
- Distributed Data Systems & Services
- General Analysis

Seventeen invited speakers have been confirmed and will be covering these different topics:

- Jerry Fishman (MSFC) - "Gamma-ray Bursts"
- Jean-Pierre Veran (HIA/DAO) - "Adaptive Optics"
- William Lupton (Keck) - "The Keck Telescope Control System"
- Don Wells (NRAO) - "The Green Bank Telescope (GBT) Active Optics"
- Eric Smith - "IR astronomy with NGST"
- Adair Lane (CfA) - "The Antartic Submillimeter Telescope/ Remote Observatory (AST/RO)"
- Dave Beazley (Univ. Chicago) - "Python"
- Michael McLennan (Cadence) - "Tcl/Tk - Welcome to the Integration Age"
- Darrel Schiebel (NRAO) - "Glish"
- Alex Szalay (JHU) - "Sloan Digital Sky Survey"
- Luiz da Costa (ESO) - "ESO Imaging Survey"
- Harry Ferguson (STScI) - "Hubble Deep Field"
- Jeff Lubelczyk (GSFC) - "Managing the Software Development Process"
- Remo Tilanus (JCMT) - "Queue/Flexible Scheduling"
- Bob Hanisch (STScI) - "Distributed Data Systems and Services"
- Rick White (STScI) - "Object Classification as a Data Analysis Tool"
- Andrew Fruchter (STScI) - "Straight Talk on Dithering, Sampling and Image Reconstruction"

Two tutorials prepared by the Software Engineering Laboratory (SEL) will be held on Sunday, October 3:

- "Software Process Improvement for Practitioners"
- "The Software Engineering Laboratory's Recommended Approach for Developing Software"

The conference also offers the "Bird of Feathers" (BOFs) sessions which consist in discussions on special topics related to astronomical software.

Further details on this exciting ADASS conference can be found online at http://www.cfht.hawaii.edu/ADASS/ or by contacting the Local Organizing Committee at CFHT (chairman: Mercedes Stevens) at adass@cfht.hawaii.edu.

## Lies, damn lies and citations

***Liz Bryson*** *and* ***Dennis Crabtree*** *- CFHT*

The library has been tracking CFHT's refereed publications and their citation numbers since 1996. Papers between 1990 and 1998 are now in our database. Citation numbers were compiled using the Science Citation Index (produced by the Institute for Scientific Information) which is available through DIALOG's web page. (The database will be referred to as 'SciSearch'). In addition, the Astrophysical Data Service has recently begun providing the astronomical community with citation information and relevant links to their refereed works.

Thus armed with a slew of numbers, we set about to analyze, synthesize and correlate our findings for data for CFHT's publications. We wanted to compare similarities and differences between ISI and ADS as they related to CFHT and, formulate any conclusions which would hopefully enlighten our use of citations, not only as they relate to CFHT, but to possible implications for the community. We present a brief compilation of presentions given to CFHT staff in May.

CFHT's approach to identifying papers to include in the database is as follows:

i) The librarian's perusal of all the major journals. ii) The librarian's perusal twice a year of all the Observer's Request for Time Allocation forms iii) The librarian's E-mailing the PI six months after the run and reminding him or her to send info regarding pertinent publications to the library

The astronomers at CFHT congregate once a year to evaluate all papers and approve their acceptability using the following guidelines:

i) The paper reports new observational data from CFHT. ii) If data from multiple telescopes are included, the CFHT data should represent a significant fraction of the total data. iii) The paper uses previously reported CFHT data and these data are the basis for a significant fraction of the paper

Thus, having the footnote "*based on observations at CFHT" does not ensure that it will be included in our database.

You can find the PowerPoint presentation containing Liz's figures on CFHT's web site: http://www.cfht.hawaii.edu/Reference/Library/Lies/index.htm ).

As expected most papers based on CFHT data appear in the three major journals Ap.J., A&A and AJ. The second figure shows the average number of citations per paper, distributed by journal, as measured in late 1998. One can clearly see that papers in A& A are less cited than papers in Ap.J.

One can look at the publication rate of individual authors for this period as well. The third figure shows the number of papers, total number of citations and average number of citations per paper for the top twenty authors as measured by number of publications. The authors who publish the most papers do not have the most citations and in are fairly low in terms of citations/paper compared to the other authors in the top twenty. The next figure shows the same three numbers for the top twenty authors as measured by citations/paper. Authors who appear in the top twenty by number of papers have the same identification number.

During our investigative process, we began to note some serious disparities between ADS and ISI's citation tally. In fact, we discovered the ADS database listed approximately 70% of CFHT's citations in comparison to the number cited in ISI. Furthermore, at a glance, it appeared as though CFHT papers with citations higher than a count of twenty, were considerably under represented by ADS. (Note: to ADS's credit, they admit to the fact that this portion of their database is incomplete and are working on getting it updated).

Liz's comparative study of one highly cited CFHT paper by observer Michael Pierce (D.L. Welch, R.D. McClure, S. van den Bergh, R. Racine, and P.B. Stetson), Nature, 1994,Vol. 371, p.385, bolstered our suspicions. And while admittedly, one paper does not constitute a scientific study, it does reveal some startling and curious data that has far-reaching implications for authors and the institutions they serve.

The first figure indicates the number of citations found in ISI (158) as opposed to ADS's (88) count. The remaining slides are a statistical comparison of the citations as found in the paper. You may preview this at the following PowerPoint site: http://www.cfht.hawaii.edu/Reference/Library/Citations/

## Observing statistics for 1998

***Dennis Crabtree*** *- CFHT*

The year 1998 was an El Nino year and this was clearly seen in the amount of time lost to weather at CFHT. The breakdown of time lost due to weather, technical problems and planned shutdown time, after removing the time lost to the gearbox problem, is shown in Figure 1. The normal amount of time lost to weather is closer to 20% rather than 14% and the effect is even more dramatic if one looks at the numbers by month (Figure 2).

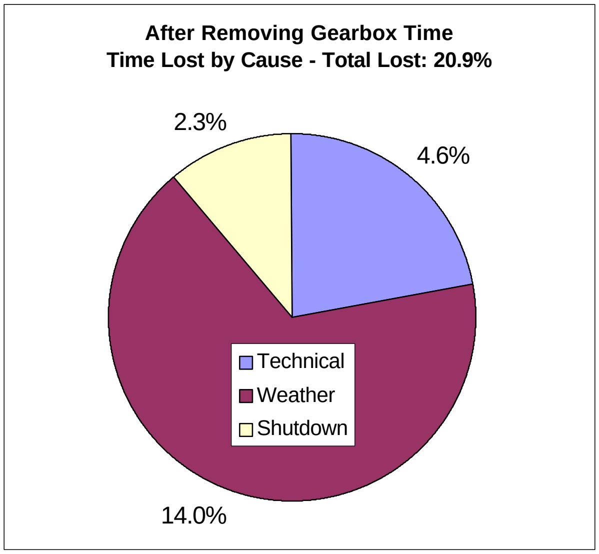



**Figure 1:** Time lost by cause

The percentage of time lost to weather in 1996, 1997 and 1998 was 31.65, 21.80 and 14.0 respectively. The breakdown by month for these three years is shown in Figure 3.

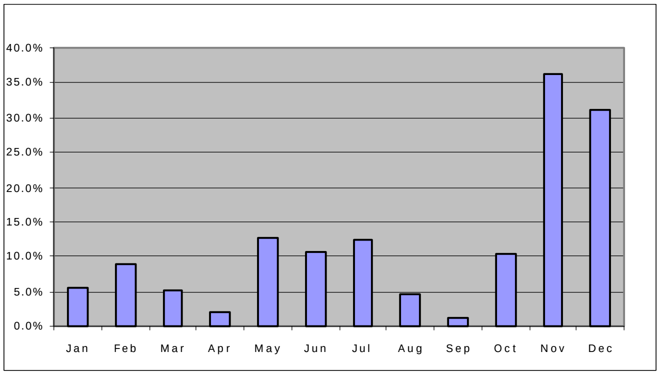



**Figure 2**: Time lost to weather by month

## Semester 99II proposals

***Dennis Crabtree*** *- CFHT*

There were a total of 156 proposals requesting a total of 451.5 nights for Semester 99II. The number of nights available after subtracting Engineering and Discretionary time was 162.5. This leads to an over-subscription rate of 2.78. CFH12K was the most requested instrument followed by AOB IR. CFH12K was also the most scheduled instrument again followed by AOB IR. The distribution of the nights requested and scheduled by instrument is shown in Figure 1. The schedule is given in Table 1.

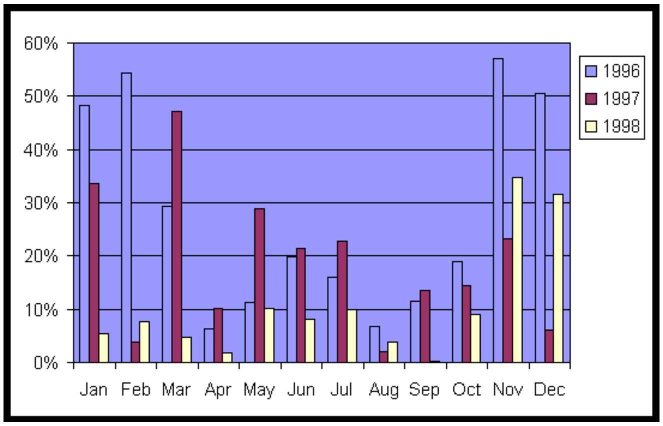
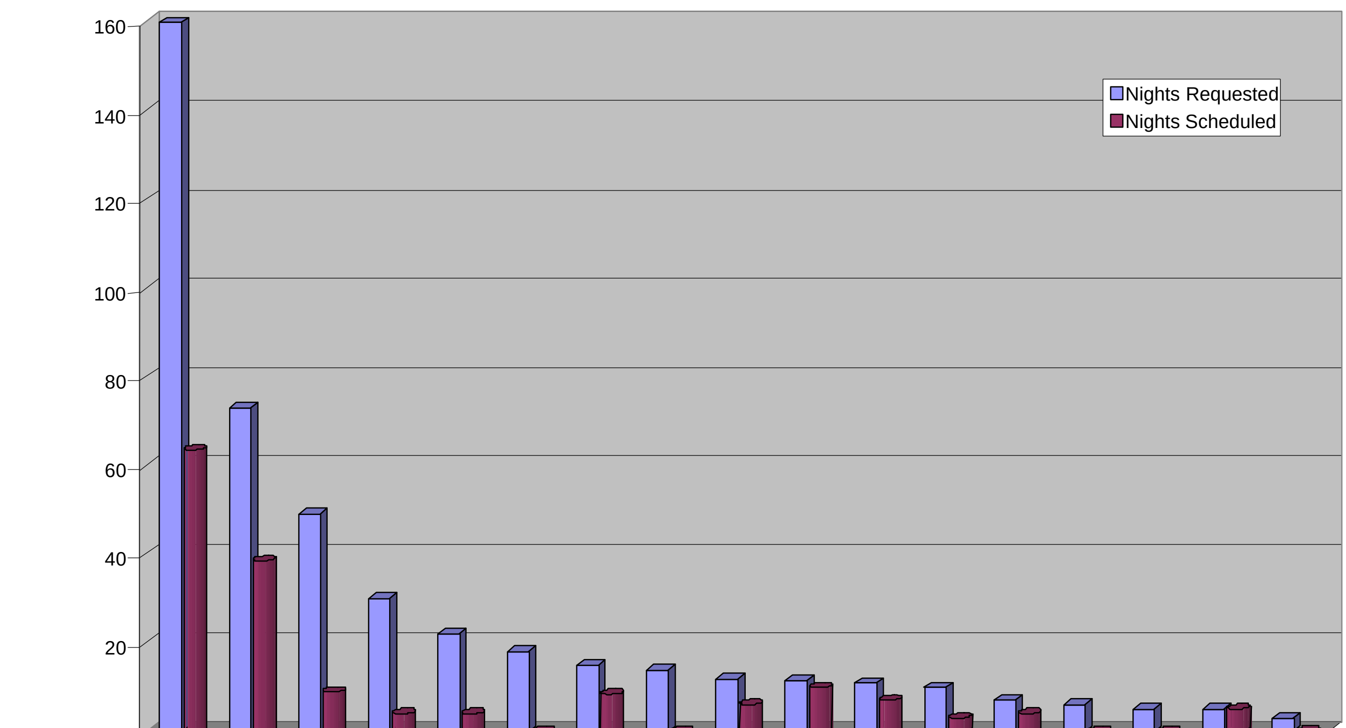



**Figure 3:** Time lost to weather by month for 1996, 1997 and 1998

**Figure 1: Nights Requested/Scheduled by Instrument**




| | CFH12K | AOB IR | OASIS | MOS | OSIS V | AOB V Wide | Gecko Red | Gecko UV | MOS/FP | FTS BEAR | FTS InGaAs | CAMIRAS | FTS InSb | SPID | C10 micron | LAPOUN E | MOS/AR GUS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nights Requested | 160 | 73 | 49 | 30 | 22 | 18 | 15 | 14 | 12 | 11.5 | 11 | 10 | 7 | 6 | 5 | 5 | 3 |
| Nights Scheduled | 63.5 | 38.5 | 9 | 4 | 4 | 0 | 8.5 | 0 | 6 | 10 | 7 | 3 | 4 | 0 | 0 | 5 | 0 |

**Table 1:** Schedule for semester 1999II

| Date | PI | Instrument | N | Program |
|---|---|---|---|---|
| 7/31/99 | Pantin | CAMIRAS | 3 | Observations a 20 microns de disques de poussieres autour d'etoiles pre-sequence principale de type HAEBE avec CAMIRAS |
| 8/3/99 | Engineering | OSIS V | 1 | |
| 8/4/99 | van Zee | OSIS V | 4 | Rotation Curves of BCD/Es: A Definitive Test of Evolutionary Scenarios |
| 8/8/99 | Carlberg | MOS | 4 | Dust Extinction at Intermediate Redshift |
| 8/12/99 | Fontaine | LAPOUNE | 5 | Mode Identification and Asteroseismology of the Pulsating Hot B Subdwarf PG0014+067 |
| 8/17/99 | Soucail | AOB IR | 3 | Etude morphologique a haute resolution de sources lumineuses dans l'infra-rouge moyen amplifiees par les amas-lentilles |
| 8/20/99 | Chapman | AOB IR | 2 | The counterparts to sub-mm detected galaxies: AOB near-IR imaging |
| 8/22/99 | Stockton | AOB IR | 0.5 | An Old Stellar Population in a Companion to the z = 1.442 Quasar TXS 0145+386 |
| 8/22/99 | Engineering | AOB IR | 0.5 | |
| 8/23/99 | Stockton | AOB IR | 0.5 | An Old Stellar Population in a Companion to the z = 1.442 Quasar TXS 0145+386 |
| 8/23/99 | Engineering | AOB IR | 0.5 | |
| 8/24/99 | Discretionary | AOB IR | 1 | |
| 8/25/99 | Walker | Gecko Red | 3.5 | Carbon chain anions as the source of certain diffuse interstellar bands |
| 8/25/99 | Engineering | Gecko Red | 0.5 | |
| 8/29/99 | Matthews | Gecko Red | 1 | Tangled magnetic fields in Mercury-Manganese stars?: High-resolution spectroscopy of magnetically sensitive Fe II lines |
| 8/30/99 | Sigut | Gecko Red | 2 | Intrinsic Line Profiles of Early B stars: Validity of the Microturbulent Model |
| 9/1/99 | Hebrard | Gecko Red | 2 | Emission des raies Balmer du deuterium dans la Nebuleuse dOrion |
| 9/3/99 | Engineering | CFH12K | 1 | |
| 9/4/99 | Jewitt | CFH12K | 4 | The Kuiper Belt |
| 9/8/99 | Pain | CFH12K | 1.5 | Detection of Type Ia Supernovae Beyond z=1. |
| 9/9/99 | Wilson | CFH12K | 0.5 | The Structure and Metallicity of the Halo of M33 |
| 9/10/99 | Pritchet/ Hudson | CFH12K | 1 | The Star Formation Rate out to z=1 from Type II Supernovae/ Weighing Dark Matter Haloes with Galaxy-Galaxy Lensing |
| 9/11/99 | Stetson /Crampton | CFH12K | 6 | Search for Halo White Dwarfs/ Probing the high redshift Universe via quasars with z $>$ 5 |
| 9/17/99 | Zorec | FTS InGaAs | 2.5 | Modelisation des profils de raies d'hydrogene des etoiles Be dans l'infrarouge |
| 9/19/99 | Bohlender | FTS InGaAs | 3.5 | The Convection and Activity Boundary in A and F stars |
| 9/23/99 | Owen | FTS InGaAs | 1 | High-Resolution Spectroscopy of Mars: Measurement of Oxygen and Carbon Isotope Ratios |
| 9/24/99 | Lellouch | FTS InSb | 2 | Mapping of Jupiter's auroral winds from the H$_3^+$ emissions with FTS-InSb and FTS-BEAR observations |
| 9/26/99 | Fouchet | FTS InSb | 2 | Determination of Jupiter's N/H ratio from FTS observations at 5 $\mu$m. |
| 9/28/99 | Discretionary | CFH12K | 1 | |
| 9/29/99 | Bouvier | CFH12K | 3 | Brown dwarfs in the Blanco 1 and Pleiades clusters |
| 10/2/99 | Luppino | CFH12K | 2 | Probing dark matter on large scales with weak gravitational lensing |
| 10/4/99 | Pain | CFH12K | 1.5 | Detection of Type Ia Supernovae Beyond z=1. |
| 10/5/99 | Discretionary | CFH12K | 0.5 | |
| 10/6/99 | Tonry | CFH12K | 2 | Cosmology from High Redshift Supernovae |
| 10/8/99 | Discretionary | CFH12K | 1 | |
| 10/9/99 | Martin | CFH12K | 1 | Deep H$\alpha$ imaging of two nearby galaxies with CFH12k |
| 10/10/99 | Pritchet/ Hudson | CFH12K | 1 | The Star Formation Rate out to z=1 from Type II Supernovae/ Weighing Dark Matter Haloes with Galaxy-Galaxy Lensing |
| 10/11/99 | Mellier | CFH12K | 1 | Weak Lensing Observations of Multiple Cluster Systems |
| 10/12/99 | Hartwick | CFH12K | 3 | A Search for the Stellar Component of High-Velocity Clouds |
| 10/15/99 | Fahlman | CFH12K | 3 | White Dwarfs in Open Clusters: The Upper Mass Limit to White Dwarfs and the Initial--Final MAss Relation |
| 10/18/99 | Engineering | FTS BEAR | 1 | |
| 10/19/99 | Lellouch | FTS BEAR | 2 | Mapping of Jupiter's auroral winds from the H$_3^+$ emissions with FTS-InSb and FTS-BEAR observations |
| 10/21/99 | Mekarnia | FTS BEAR | 4 | Spectro-Imagerie dEtoiles Symbiotiques |
| 10/25/99 | Cox | FTS BEAR | 2 | Kinematics of H$_2$ in AFGL~2688 and NGC~7027 |
| 10/27/99 | Joblin | FTS BEAR | 2 | Physico-chimie de H2 et des PAHs liee a la dynamique des regions de photodissociation. I- Spectro-imagerie a 2micron des raies du gaz: H2 et H |
| 10/29/99 | Brewer | CFH12K | 2 | AGB population in M33 |
| 10/31/99 | Pritchet/ Hudson | CFH12K | 1 | The Star Formation Rate out to z=1 from Type II Supernovae/ Weighing Dark Matter Haloes with Galaxy-Galaxy Lensing |
| 11/1/99 | 12kComm | CFH12K | 1 | |
| 11/2/99 | Luppino | CFH12K | 1 | Probing dark matter on large scales with weak gravitational lensing |
| 11/3/99 | Tonry | CFH12K | 2 | Cosmology from High Redshift Supernovae |
| 11/5/99 | Le Fevre | CFH12K | 9 | A deep wide field imaging survey |

**Table 1:** - continued

| | | | | |
|---|---|---|---|---|
| 11/14/99 | Kneib | CFH12K | 3 | Testing Cluster Mass Profiles with a Joint CFHT/HST Survey of X-ray Selected Clusters of Galaxies |
| 11/17/99 | Field | AOB IR | 3 | Small Scale Structure of fluorescent H$_2$ IR emission in the reflection nebulae NGC 7023 and NGC 2023 |
| 11/20/99 | Merline | AOB IR | 2 | Search for Asteroidal Satellites |
| 11/22/99 | Roddier | AOB IR | 1 | Adaptive Optics survey of M stars closer than 5 parsec |
| 11/23/99 | Roddier | AOB IR | 1.5 | Adaptive optics survey of nearby stars with IR excess |
| 11/24/99 | Roddier | AOB IR | 1.5 | Astrometry and photometry of close T Tauri binaries |
| 11/26/99 | Forveille | AOB IR | 3 | Binaries among very low-mass stars and brown dwarfs |
| 11/29/99 | Engineering | OASIS | 2 | |
| 12/1/99 | Discretionary | OASIS | 1 | |
| 12/2/99 | Martin | OASIS | 3 | Star formation mechanisms in galactic bars |
| 12/5/99 | Emsellem | OASIS | 3 | Dynamique des galaxies doublement barrees: couplage gaz/etoiles et activite du noyau. |
| 12/8/99 | Pecontal | OASIS | 3 | The core structure of Seyfert galaxy nuclei |
| 12/11/99 | Johnstone | MOS/FP | 5 | Revealing Supersonic Flows and their Sources in the Orion Nebula Using Fabry-Perot Imaging Spectroscopy |
| 12/16/99 | Joncas | MOS/FP | 1 | Determination de la structure interne des regions HII |
| 12/17/99 | Simon | AOB IR | 2 | Pre-Main Sequence Binaries in the Lynds 1641 Dark Cloud |
| 12/19/99 | Engineering | AOB IR | 1 | |
| 12/20/99 | Engineering | AOB IR | 0.5 | |
| 12/20/99 | Discretionary | AOB IR | 0.5 | |
| 12/21/99 | Rouan | AOB IR | 3 | Tore moleculaire dans les Noyaux Actifs : imagerie et spectro-imagerie infrarouge a haute resolution angulaire |
| 12/24/99 | Labrie | AOB IR | 2 | The Near-IR [FeII] Line Emission from Star-Forming Regions in NGC 1569 and NGC 4449 |
| 12/26/99 | Tokunaga | AOB IR | 2 | Search for Substellar Companions in the Ursa Major Group |
| 12/28/99 | Engineering | CFH12K | 3 | |
| 12/31/99 | Morbidelli | CFH12K | 2 | Mapping the Structure and Dynamics of the Kuiper Belt: recovery observationsof Kuiper Belt Objects. |
| 1/2/00 | Chambers | CFH12K | 3 | The Wide Field Optical and Infrared Imaging Polarimetry Survey |
| 1/5/00 | Kavelaars | CFH12K | 1.5 | Mapping the Structure and Dynamics of the Kuiper Belt: recovery observations of Kuiper Belt Objects. |
| 1/6/00 | Hall | CFH12K | 0.5 | Photometric Redshifts in the Field of a Candidate z=1.5 Quasar Host Cluster |
| 1/7/00 | Gladders | CFH12K | 4 | A Wide-Field High-Redshift Galaxy Cluster Survey |
| 1/11/00 | Yee | CFH12K | 3 | Evolution of Faint Galaxies Using Multicolour Photometry |
| 1/14/00 | Discretionary | CFH12K | 1 | |
| 1/15/00 | Maurogordato | CFH12K | 1 | Deep multicolor wide-field imaging of Abell 521 |
| 1/16/00 | Fischer | CFH12K | 2 | Weak Lensing Observations of CNOC Clusters |
| 1/18/00 | Discretionary | AOB IR | 0.5 | |
| 1/18/00 | Dumas | AOB IR | 0.5 | Adaptive Optics Observations of Io Volcanism |
| 1/19/00 | Plante | AOB IR | 4 | Dust and very young star-forming regions |
| 1/23/00 | Hutchings | AOB IR | 2 | EMISSION LINE IMAGING OF qsos AT HIGH REDSHIFT |
| 1/25/00 | Engineering | AOB IR | 1 | |
| 1/26/00 | Discretionary | AOB IR | 1 | |
| 1/27/00 | Perrier-Bellet | AOB IR | 2 | Determination de la relation masse--luminosit\'e de la tr\`es basse sequence principale |
| 1/29/00 | Combes | AOB IR | 3 | Nested Bars and the Fueling of AGN (continuation + end) |
| TOO | Boer | Other | | Detection rapide de la contrepartie optique des sursauts gamma cosmiques |