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# CASSIOPEIA

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### ADDRESS CHANGES

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 CASCA Secretary  
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**Weaving the Astronomy Web (WAW)**

6 - 7 April, 1995, Strasbourg, France  
*waw@astro.u-starsbg.fr* (D. Egret/A. Heck)  
<http://cdsweb.u-starsbg.fr/waw.html>

**CFHT Users' Meeting - The Future of CFHT**

May 15 - 17, 1995, Lyons  
 This will be preceded by a workshop in Paris  
*Georges Paturel/Francois Sibille*

**CASCA 1995 - The Phenomena and Physics of the Interstellar Medium**

May 27-31, 1995, Penticton  
*rsr@drao.nrc.ca* (Rob Roger)

**?????? The Science to be Done With Large Telescopes**

???????

June 1-3, 1995, UBC  
*usergahw@mtsg.ubc.ca* (Gordon Walker)

**186th Meeting of the AAS**

11 - 16 June 1995, Pittsburgh, Pa  
*rms@vms.cis.pitt.edu* (Regina Schulte-Ladbeck)

**The Origins, Evolution and Destinies of Binaries in Clusters**

19 - 23 June 1995, University of Calgary  
*milone@acs.ucalgary.ca* (Gene Milone)

**Radio Emission from the Stars and the Sun**

3 - 7 July 1995, University of Barcelona, Spain  
*radio@mizar.am.ub.es* (Dr. J. M. Paredes)

**The Long-Term Future of CFHT.**

The long-term future of CFHT will be discussed at the CFHT Users meeting this May in France. Since this is a very important issue and not everyone will be at the Users meeting OIRAC (Optical and Infrared Astronomy Committee), with the help of the CADC, has established an e-mail discussion group to allow the community to discuss this very important issue.

If you wish to participate in the discussion, please send e-mail to: *cfht-future-request@dao.nrc.ca* with the single word 'subscribe' in the body of the message. Do not include the quotes in your message. You may unsubscribe from this list at anytime by sending a message to the above address with the word 'unsubscribe' in the body of the message.

**Dennis Crabtree (for OIRAC)** (*crabtree@dao.nrc.ca*).  
(See also pages 7 - 10)

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## Weaving the Astronomy Web (WAW)

Strasbourg Astronomical Observatory (France) is organizing the conference 'Weaving the Astronomy Web (WAW)' on 6-7 April 1995, i.e. just before the 'Third International World-Wide Web Conference'.

This Conference will be a forum for astronomical data providers, webmasters, astronomers and space scientists interested in the current and future developments of the World-Wide Web, and more generally of electronic on-line information handling in an astronomy and space sciences context.

Here are some of the topics to be addressed during this two-day conference:

- Basic astronomy servers,
- Distributed information services,
- On-line yellow-page services,
- Meta-indices of astronomy resources,
- Searching tools,
- Library services,
- Publishing on the Web,
- Data policies.

Abstracts of proposed contributions should have been sent by electronic mail to *waw@astro.u-strasbg.fr* before January 15, 1995. An HTML version of the contributions will have to reach the same address before March 1st, 1995.

D. Egret & A. Heck

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e-mail: *waw@astro.u-strasbg.fr*

URL: *http://cdsweb.u-strasbg.fr/waw.html*



Those who did send in announcements, "Thank you!"  
The Editor apologizes for not getting CASSIOPEIA out in time to meet your deadlines.

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## Radio Emission from the Stars and the Sun

July 3 - 7, 1995  
Barcelona, Spain

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### Background

It has been 10 years since the last meeting devoted to stellar radio emission (Radio Stars: Boulder, Colorado, 1984). Since that time there have been major observational advances in this field. The number of stars and classes of stars that are known to be sources of radio emission have increased dramatically. We are now able to image radio emission from stellar sources at resolution and sensitivity that was impossible 10 years ago. Moreover, there have been new and exciting results in both continuum and spectral line, arising from new telescopes operating at millimeter and submillimeter wavelengths. These data have revealed new phenomena associated with stars and have yielded new observational data on previously known phenomena. It is time to synthesize this rich and powerful set of new radio observations; to bring together workers in this field and to help turn this data into new theories and insights into the processes giving rise to stellar radio emission.

At the same time that major advances have been made in observations of radio stars, the study of solar radio emission has been making tremendous strides, particularly in the area

of active phenomena. Observational highlights include i) results from the new Japanese radioheliograph; ii) joint microwave soft X-ray, and hard X-ray imaging of solar flares by the VLA, the Japanese radioheliograph, and YOHKOH; iii) high-time resolution imaging of dynamical phenomena; iv) joint continuum imaging and spectroscopy of decimetric phenomena; v) broadband microwave imaging spectroscopy; vi) mapping at millimeter and submillimeter wavelengths.

Solar and stellar radio astronomers have traditionally worked as two separate communities. Given the significant advances in each area, we have an excellent opportunity to foster cross-fertilization between the two disciplines. One of the goals of this meeting is to bring these two communities together to explore those areas of astrophysics in common and to study the solar-stellar connection.

The meeting will take place from 3 to 7 July at the University of Barcelona.

## Topics

Radio Emission from Circumstellar Envelopes  
 Novae and Cataclysmic Variables  
 X-ray Binaries  
 Supernovae  
 Radio Activity from Stars  
 The Active Sun  
 The Quiet Sun  
 The Solar-Stellar Connection

## Meeting structure

The present meeting will consist mainly of invited talks and poster contributions. A limited number of oral contributions will be scheduled. Particular time slots for poster discussion will also be allocated.

## Financial Assistance

A limited number of travel assistance grants will be allocated by decision of the Scientific Organizing Committee. Priority will be given to students and young scientists, specially from developing countries.

\*\*\*\*\*

## Scientific Organizing Committee:

T. Bastian (USA)  
 S. Enome (Japan)  
 R. Hjellming (USA)  
 J.F. Lestrade (France)  
 M. Massi (Italy)  
 J.M. Paredes (Spain)  
 B. Phillips (USA)  
 L.F. Rodriguez (Mexico)  
 E. Seaquist (Canada)  
 R. Spencer (UK)  
 R. Strom (The Netherlands)  
 A.R. Taylor (Canada, Chair)  
 R. Vermeulen (USA)

## Local Organizing Committee:

G. Anglada (Universitat de Barcelona)  
 R. Estalella (Universitat de Barcelona)  
 J. Marti (Universitat de Barcelona)

J.M. Paredes (Universitat de Barcelona, Chair)  
 M. Peracaula (Universitat de Barcelona)  
 A. Rius (CSIC - INTA)

## Conference Proceedings:

Invited talks and contributions (oral and poster) will be published as a Proceedings book.

**Editors:** A.R. Taylor, J.M. Paredes

## Sponsorship:

Comissio Interdepartamental de Recerca i Innovacio Tecnologica (CIRIT)  
 Community of European Solar Radio Astronomers (CESRA)  
 Universitat de Barcelona (UB)

\*\*\*\*\*

## Practical Information

**Dates:** July 3 - 7, 1995

**Location:** Facultat de Fisica,  
 Universitat de Barcelona,  
 Av. Diagonal 647,  
 E-08028 Barcelona, Spain

**Registration fee:** 23000 Pesetas (about US\$175) for early registration  
 26000 Pesetas (about US\$200) for late registration (upon arrival).  
 Includes a copy of the Proceedings book.

**Accomodations:** There are several hotels within walking distance of the conference center with prices in the range of US\$45 (Single), US\$54 (Double) for a \*\* hotel. Relatively inexpensive accomodation will be available in students rooms.

**Calendar:** March 1st 1995 : second announcement  
 June 1st 1995 : deadline for early registration and submission of abstracts

**Contact e-mail address:**  
*radio@mizar.am.ub.es*

## Pierre Bergeron - Université de Montréal Chrétien Grant Winning Proposal

In collaboration with M.-T. Ruiz (U.of Chile) and S.K. Leggett (JACH), we are obtaining optical and infrared photometry, as well as optical spectroscopy, of cool ( $T_{\text{eff}} < 7000\text{K}$ ) white dwarf stars. Effective temperatures, surface gravities, and chemical abundances of helium and hydrogen are determined for individual objects by fitting the optical/infrared energy distributions with the predictions of new model atmospheres appropriate for these cool degenerate stars. Our results indicate that the atmospheric composition of the coolest stars can be inferred from the observed energy distributions, and that objects with mixed compositions ( $N(\text{He})/N(\text{H})$ ) are easily recognizable from their predicted strong infrared flux deficiency. Our study reveals that the dichotomy observed in hotter white dwarf atmospheres, namely that the photosphere is composed either of nearly pure hydrogen or of nearly pure helium, persists at low effective temperatures. In particular, no white dwarf star with a helium-to-hydrogen ratio near unity has been found, with the exception of the peculiar white dwarf LHS 1126. High signal-to-noise spectroscopy has revealed the presence of  $H\alpha$  in many previously classified featureless stars, and it has been detected in objects as cool as  $T_{\text{eff}} \approx 4600\text{K}$ . When completed, our analysis should shed some light on the physical mechanisms at play, such as convective mixing and accretion from the interstellar medium, which can alter the photospheric chemical composition.

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To: CASCA members

From: W. E. Harris, President

Those of you who rely on NSERC funding in particular will be interested in the results that have just come down from NSERC Council about the global funding re-allocation exercise. You can find full details through the NSERC gopher (*gopher gopher.nserc.ca*) or probably through your Research Services office. However, some important items are the following:

► First and foremost, for the Research and Infrastructure Grants budget, all grant selection committees were ranked by:-

- (1) Quality of research
- (2) Discipline dynamics
- (3) Highly qualified personnel (= perceived need for same)

In category (1) Space and Astronomy was ranked SECOND out of 20 disciplines, behind only Psychology. In categories (2-3), it was ranked 13 and 14 respectively.

The net result of this is predicted to be a net gain of 2.4% in the total budget for Research and Infrastructure grants, or a bit more than \$100,000.

► Numerous smaller programs deemed to be 'non-central' to the mandate of NSERC are going to be phased out over the next 4 years; including 1967 Science Scholarships, WFA's, International Fellowships, Conference and Publication Grants, and several other things.

Our community can clearly take pride in the level of our work both nationally among other disciplines, and internationally among other astronomers, and it is gratifying to see this recognized by our most important funding agencies once again. I urge you to consult the NSERC news bulletins for the full information.

## REPORT ON NOVEMBER 1994 SAC MEETING

The Scientific Advisory Council of CFHT held its 46th meeting on November 3rd to 5th 1994 at the CFHT headquarters in Waimea, Hawaii. The SAC members present were Jerome BOUVIER, Claude CATALA, Ken CHAMBERS, Michael DeROBERTIS, David HANES, Esther HU, Gilles JONCAS, Nicolas MAURON, Yannick MELLIER (vice-chairperson) and Harvey RICHER (chairperson). The Corporation was represented by its Executive Directors Pierre COUTURIER and John GLASPEY. A number of recommendations to CFHT or to the Board of CFHT were developed by the SAC during the meeting, and these are summarized below.

### 1. Fibre Feed to Coude

The SAC recommends that the CFHT proceed with the development of a Cassegrain fibre feed to coude; but recognizing that the CFHT has no cross-dispersed spectrograph capability, the SAC suggests that the polarimetry module not be included in the present development, as the limited wavelength coverage available at coude will make such a facility uncompetitive.

### 2. Seeing Monitor for Mauna Kea

Gemini North has expressed interest in a seeing monitor facility for purposes of flexible scheduling. As a shared facility, this might be used for better site characterization and for the optimization in real time of observing programs on the various Mauna Kea telescopes -- particularly when adaptive optics instrumentation, such as the CFHT AO bonnette, may be in use. One possible implementation is to use two existing radio antennae employed in recent atmospheric tests by SAO (the Smithsonian Astrophysical Observatory), in preparation for the submillimeter array, as the basis for a communal seeing monitor facility for optical and IR observations on the summit. The SAC raised questions about whether radio phase monitors could provide useful information on optical and IR seeing, and also about the degree to which measurements from the SMM site (by the JCMT and CSO) might be representative of seeing conditions on the summit. (It was noted that in tests done by ESO there was difficulty in using

data from a seeing monitor to estimate telescope seeing conditions, when the two sites were widely separated). However, the SAC felt that in view of the potential benefits of a shared facility, and preliminary interest expressed by Gemini and Keck, that a more detailed investigation of ways of implementing such a facility should be made. The time scale set by the Gemini requirements would require this be ready by mid-1997.

The SAC thus encourages the CFHT to explore the possibility of a common user seeing monitor facility, and to present a more detailed report at the next SAC meeting.

### 3. Status of New Guest and Visitor Instruments for CFHT

While an increasingly large number of time request proposals involve use of CFHT instruments operated in standard configurations, a small fraction of them are based on either additional modifications of these configurations, or even full development of new observing modes in these instruments. In many cases, no full assessment of technical issues and needed manpower are presented by applicants.

In view of the importance of coherently planned work, efficiency and reliability of CFHT instruments, SAC fully endorses the point of view of the Director, that, in case of insufficient preparation and prior contact with CFHT, and irrespective of the scientific value possibly recognized by Time Allocation Committees, the proposal will not be accepted by the Executive.

### 4. New Policy for the Purchase of Filters and Grisms.

Since CFHT is frequently asked to purchase filters or grisms by observers, the executive felt it was time to establish rules regarding such purchases. They proposed the following policy:

- a. The Principal Investigator of a program who wants CFHT to buy a new filter or a new grism, must contact in writing the CFHT Director, justifying the request, before the deadline for submission of observing time requests. CFHT's Director will inform the appropriate TAC if CFHT will buy the required filter or grism, or not.



b. The forms for proposals will have to be completed correctly: the PI is responsible for making a clear statement on the filters and grisms which are required. In cases where the Director was not contacted in advance of the deadline, CFHT will not be committed to buy any filter or grism just because a proposal is selected by the Canadian Telescope Assignment Committee.

c. The decision by CFHT on grisms or filters selected for purchase, will be communicated to CTAC together with the technical appraisals of the time requests:

- if the filter or grism is considered for common use for the future, CFHT will purchase it
- if the filter or grism is strictly related to the special observations requested by the observer, CFHT will help, if requested, in the specifications and the selection of vendors but the the observer will have to purchase them.
- in some less clear-cut cases, if the observer agrees to leave the filter or grism at the disposal of other observers, CFHT and the observer will share equally the cost.
- if the number of filters and grisms requested in one year exceeds the budget allocated for this purpose, CFHT will ask TAC and/or SAC to prioritize the requests to be satisfied.

d. For filters, a three month delay between the order and the delivery is common. As soon as the schedule of observations for the semester is known, the procedure to order the filters has to start. CFHT will not be responsible for slow response from the observers or for unforeseen delays from the vendor.

For grisms, it takes between five and seven months to get a delivery, so clearly the order needs to be prepared well in advance of the telescope time request.

e. Requests not documented in the time request form and coming after selection process could be ignored and CFHT is in no way obligated to satisfy them.

SAC endorses this policy which will be explicitly stated in the next CFHT Bulletin.

## 5. CFHT on Mosaic.

The CFHT staff has devoted a substantial effort to develop and improve the CFHT Homepage on the World Wide Web (WWW) which is accessible via Mosaic. This new tool provides a direct access to the most recent information regarding CFHT's activities, especially the latest news on instrumentation, and is therefore extremely useful to the CFHT

applicant. In particular, it avoids the publication delays of the CFHT Information Bulletin where this information used to be found. Thus, as long as the content of the CFHT Homepage is regularly updated so that it does indeed provide the latest information, it will provide the most important link between the users and the telescope facilities. The CFHT Homepage will become very popular as the WWW spreads within the community, and its continual development must therefore be actively pursued. The SAC congratulates the CFHT for producing such an excellent World Wide Web document which is both clear and concise. SAC suggests that the MOS-SIS manual be brought on-line within the document as soon as possible as well as any manuals for visitor instruments which are or become available in this format. The SAC also suggests that relevant information be updated frequently -- especially before proposal deadlines -- and that the date of the last update be recorded. Finally, SAC recommends an option be made available to the community which includes CFHT contact information for instrumentation responsibilities.

## 6. Infrared Detectors at CFHT.

The presently available Redeye cameras will not provide a correct sampling of the PSF of the Adaptive Optics Bonnette and of OSIS, nor will they cover adequately the field of these instruments. If no strong and immediate effort is made to remedy this situation, the CFHT will not be competitive in the area of near-IR imaging and spectroscopy when OSIS and the AOB become operational.

Several possible solutions were discussed. The first group of solutions consists in using parts of the existing Redeye camera, and imply a rebuild of its optics. There are three possible options along this line:

- Keep the NICMOS 256 x 256 array unchanged in the camera; a rebuild of the camera optics will lead to a correct sampling of the PSF, in order to take advantage of the superb image quality behind the AOB, or with OSIS. A serious drawback of this solution is the resulting reduced field of view, in particular in the case of OSIS.
- Replace the NICMOS 256 x 256 array in Redeye with an inexpensive 1k x 1k x 18 micron array, perhaps with only one quadrant operational. Such an array could be acquired at a reasonably low cost. This solution would still require a rebuild of the Redeye optics to

properly sample the PSF, but the field of view, although still not optimal, would be twice that of the previous solution, for a moderate extra-cost. However, the implantation of a new chip in Redeye would require significant additional manpower. CFHT will probably not be able to provide it within the next year, a time frame that is dictated by the need to have a proper IR detector when OSIS and AOB become operational.

· Purchase a Grade "A" 1k x 1k IR array with 18 micron pixels, and install it in Redeye, after a rebuild of its optics. With this solution, both the requirements on the PSF sampling and the field coverage are met, but the difficulties mentioned above concerning the necessary manpower to install such a chip in Redeye are still present. Finally, the last solution involves the acquisition of a new IR camera, independent of the Redeye design. Under this plan the CFHT would acquire a complete IR camera, with a 1000 x 1000 array with 18 micron pixels. The recognition that this was the only practical way to ensure the availability of a proper IR camera when AOB and OSIS become operational led to the following recommendation to the Board of CFHT.

***The SAC emphasizes the strong and urgent need for a near-IR camera with an adequate sampling of the PSF and an optimal coverage of the field of the AOB and OSIS. This detector should be available at CFHT as early as 1996, when both OSIS and the AOB become operational, so that CFHT can be fully competitive in due time in the area of non thermal infrared imaging and spectroscopy.***

Considering that the manpower necessary to develop such a camera in this time frame does not exist at CFHT, the SAC recommends the acquisition of a complete IR camera housing a 1000 x 1000 array, after CFHT has defined exactly what device is needed. The SAC recognizes that there is no solution for funding such an acquisition within the present CFHT budget in the required time frame. Consequently, the SAC recommends that an exceptional capital expense be provided by the agencies for this absolutely necessary acquisition.

## 7. Network of Instrumentation Groups.

The complex set of instruments available at the CFHT, coupled with the necessarily measured pace at which the CFHT Information Bulletin is produced, means that any helpful insights or "tricks of the trade" developed by one observer are slow to reach a broad audience. Understandably, news of problems is generally more quickly propagated through the user community, but often in distorted form, with the result that needless worries are generated.

For this reason, the suggestion has been made that the community consider the establishment of instrument-specific Networks of Working Groups. In the model discussed, one user would serve as an informal chair to whom could be transmitted, by electronic mail, anecdotal end-of-run remarks about insights gained and problems encountered with the instrument in question, especially when it is used in non-standard ways. (These reports would not supplant the usual end-of-run reports.) In the ideal model, the remarks would not simply accumulate in a scrapbook of unrelated ideas, but would be annotated, cross-referenced and summarized to provide guidance for future, and especially first-time, users. A collection of FAQs (Frequently Asked Questions) with answers would provide a friendly and helpful introduction to the instrument.

Clearly, to avoid the propagation of misleading or incorrect information, the Working Group information would have to be referred to the appropriate CFHT personnel as well, and a close link will need to be established. It would seem most advantageous, therefore, to use the Mosaic facility to this end, with the accumulated wisdom accessible through the CFHT home page.

SAC proposes that a trial of this concept would be in order, with MOS as the instrument in question. DAVID HANES, of Queen's University, will serve as the chair. When the procedures involved have been established through consultation with the CFHT, announcements will be provided to the community through the electronic mail network, as well as in the next CFHT Information Bulletin. We expect the trial to begin early in the first semester of 1995.

## 8. Preparations for the Users Meeting.

With the agreement of the astronomers from the Observatoire de Lyon, it has been decided that the next CFHT Users meeting will be held in Lyon, at the Ecole Normale Supérieure (ENS) from May 15 to May 17, 1995 inclusive. The ENS is located in downtown Lyon, about 1 km from the TGV Perrache station. The address is:

ENS Lyon  
46 Allée d'Italie  
69364 Lyon Cedex 07.

The ENS is fully equipped for such meetings, with large amphitheatres and rooms. At least 2 inexpensive hotels are located nearby which should be capable of accommodating the 80-120 expected attendees.

The Local Organising Committee is not yet fully constituted and operational, but Georges Patrel and Francois Sibille have taken care of the initial facets of the organisation. The CFHT person responsible for the meeting is Marc Azzopardi who was involved in the organisation of the first Users Meeting.

This users meeting is the last one before 10-meter class telescopes become fully operational. In 1998 the second Keck, the Subaru the first VLT and Gemini North should be almost finished and in this context we must address now the crucial problem of the future of CFHT for the beginning of the year 2000. Hence, the SAC decided to entitle this meeting "The Future of CFHT". A large fraction of the meeting will be dedicated to talks and open discussion concerning the possible scientific role of CFHT in the era of the 10-meter class telescopes.

Harvey Richer ([richer@geop.ubc.ca](mailto:richer@geop.ubc.ca))

**MORE ↓↓↓↓ MORE ↓↓↓↓ MORE**

## The Future of the CFHT

The next CFHT Users Meeting in Lyon, France (15-17 May 1995) is devoted to the near and long-term future of the CFHT. In order to facilitate discussion at this meeting, the CFHT SAC would like to solicit opinions at this time from members of the Canadian and French communities along these lines. Comments will be compiled and presented by a SAC member from each nation at the meeting.

To this end, the CFHT and SAC have produced a document which is accessible via the CFHT Home Page on the World Wide Web (WWW). In this document, users are provided with SAC's specific concerns (see below) and are instructed in how to leave comments or how to browse through the comments which have already been left. Information about the upcoming Users Meeting is also contained in this document, and will also be promulgated separately via the CASCA e-mail exploder early in 1995.

OIRAC has established a listserver service in conjunction with the CADC in order to discuss the CFHT's future in a somewhat broader context. The SAC *strongly*

encourages the Canadian user community to participate in this opinion survey, either through the CFHT (via the WWW) or the CADC. Comments from both services will be presented at the Users Meeting.

For those who wish to use the CFHT service, recall that the URL (Uniform Resource Locator) for the CFHT's Home Page on the WWW is: <http://www.cfht.hawaii.edu>.

A portion of the CFHT (html) document containing SAC's specific concerns follows: "[SAC is] interested in determining *scientific programs* as well as corresponding *modes of operation* and *instrumentation* in which the CFHT could be competitive with the next generation of 8-m class telescopes that will be in operation by the end of this decade."

Canadian users who would like to express their opinions on these matters may send e-mail to [cfht-future-ca@cfht.hawaii.edu](mailto:cfht-future-ca@cfht.hawaii.edu). Private comments to the SAC may be directed to [mmdr@sol.yorku.ca](mailto:mmdr@sol.yorku.ca).

M. De Robertis, CFHT SAC

## Small Scientific Satellite Program of the Canadian Space Agency

The newly approved Long Term Space Program (1994/95 - 2003/04) of the Canadian Space Agency includes an initiative which might be of interest to members of CASCA. For further details, please contact Dr. Denis Leahy ([leahy@iras.ucalgary.ca](mailto:leahy@iras.ucalgary.ca)), the Chair of the Joint Subcommittee for Space Astronomy.

Over a 10 year period, the Canadian Space Agency has two launches with the Pegasus XL rocket (approx. 1000 lb in low Earth orbit). The budget per payload is intended to be \$10M (excluding launch). A payload could include more than one satellite. The small budget means that such satellites must be very simple (i.e. either one-axis stabilized (spinning) or low accuracy 3-axis stabilized). Estimates of costs of such satellites vary considerably depending on exact specification; for example, Orbital Science Corporation (in the US)

claims to provide a 3-axis stabilized satellite, pointing to  $\pm 2$  degrees, for about \$2-4M while requirement of sub-arcminute pointing may involve costs at the level \$15-35M.

The Announcement of Opportunity will be put out by CSA in early 1995 and relatively short proposals (about 20 pages long) will be solicited at this stage. Some 4-5 proposals will be then selected for in-depth studies later. Astronomy will compete with 3 other disciplines within the space-science division (solar-terrestrial, life sciences, and microgravity), so that proposals would have to demonstrate a very high scientific return. Note that currently active astronomical missions in which CSA is involved include participation in FUSE, ODIN, Radio-Astron and/or VSOP, Spectrum-X/Gamma, and the HST archive.

W. E. Harris and S. Rucinski  
for the CASCA Board

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## HIGHLIGHTS FROM THE JCMT GROUP ANNUAL REPORT 1993 Nov./1994 Oct.

The James Clerk Maxwell Telescope Group of the National Research Council of Canada operates as part of the Herzberg Institute of Astrophysics. Canada has a 25% share in the telescope.

**Receiver B3:** The JCMT Group in Ottawa is building Rx B3, a 345 GHz common-user SIS receiver for the JCMT in Hawaii. This facility instrument will provide an order of magnitude improvement over the Rx B3i single-channel lead-alloy SIS receiver delivered to the JCMT in Hawaii in November 1991. The new dual-polarization receiver will use Nb-based SIS mixers with an instantaneous bandwidth of 1.5 GHz. It will provide fully automated tuning and single sideband operation. The project is a collaborative effort with the Rutherford Appleton Laboratory (England) and the Space Research Organization Netherlands (Groningen).

**MIDAS project:** Hayward is the project leader for the Multi-Input Digital Autocorrelation Spectrometer (MIDAS). It is being developed to accommodate the 345 GHz dual-polarization 4 x 4 focal-plane array receiver currently being designed in the UK for the JCMT. This spectrometer, built in two phases, will be able to process 32 individual IF outputs, each with instantaneous bandwidth of up to 2 GHz.

**Upgrades program:** Cunningham and Wade are developing an extensive upgrades program for JCMT receivers. This project will ensure that the telescope remains competitive, primarily by upgrading the mixers with SIS devices that are more sensitive and will not require mechanical tuning elements.

**Jupiter encounter:** Griffin (QMW), Marten (Meudon), Naylor and Tompkins (both at Lethbridge), Davis (Saskatchewan), Matthews, Holland (JAC, Hilo), Han (UH, Manoa) and others used the JCMT to observe the encounter of Comet Shoemaker-Levy 9 with the planet Jupiter in July 1994. Despite the presence of Hurricane Emilia, the JCMT obtained submm spectral observations with both a broad-band FTS (from the Univ. of Saskatchewan) in front of the bolometer, and with the usual spectral line receivers. The HCN  $J = 3-2$  and  $J = 4-3$  lines were detected in about half of the impact sites, and were still observable at the end of 1994 July, and later.

**M-type asteroids:** Redman, Feldman, and Matthews observed the two largest M-type asteroids, 16 Psyche and 216 Kleopatra, using the JCMT. They confirmed that the emissivities of these largely metallic objects are significantly lower than the emissivities of other asteroids.

**Maser line:** Thum (IRAM), Tacconi, Harris and Schuster (all MPE) and Matthews made the first successful observations of the H<sub>2</sub>1 $\alpha$  recombination line from MWC349 with the new MPE high-frequency SIS receiver on the JCMT. This object is the only source in which recombination lines are known to maser. Maser emission had been observed before at lower frequencies; the latest observations at 662 GHz at the JCMT show that the maser emission is present at still higher frequencies. Two main peaks, which appear to arise from the ionized inner boundary of a massive stellar disk, display saturated maser behavior.

**Outflows:** MacLeod, Avery, Harris and Tacconi (the last two at MPI, Garching) and Schuster (IRAM) have detected at the JCMT strong CO  $J = 6-5$  emission associated with IRAS04368+2557. This CO emission is extended, arising not only in the region of the dense core but also at some of the hot spots out in the outflow lobes. This emission is evidence of shocks generated at the interface between a fast wind and the ambient material.

**Dust clouds:** Using the JCMT with the UKT14 bolometer and the Aberdeen/QMW polarimeter, Vallee and Bastien (U. de Montreal) observed the extreme-infrared (800 microns) emission from two molecular clouds W75N-IRS and M17-SW, as well as many others. In M17-SW, the magnetic field is perpendicular to the elongation of the cloud. In W75N-IRS, the magnetic field is parallel to the cloud elongation (thus perpendicular to the CO outflow). The last object is thus in contradiction with some predictions in the Pudritz-type models of disks and outflows.

**Gas clouds:** Bell and Matthews detected C<sub>3</sub>N in the spiral arm gas clouds in the direction of Cas A. This emission is from dense gas clouds, not from diffuse gas clouds.

Contributed by J.P. Vallee.

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## Semi-annual Meeting of CTAG for JCMT

The Canadian Time Allocation Group (CTAG) for the James Clerk Maxwell Telescope (JCMT) held its semi-annual meeting in Ottawa on 26/27 November, 1994.

Its members are:

Dr. T. Hasegawa (St.Marys)  
 Dr. P. Feldman (HIA)  
 Dr. W. McCutcheon (UBC)  
 Dr. C. Wilson (McMaster)  
 Dr. G. Moriarty-Scheiven (HIA)

Le Groupe Canadien d'Allocation de Temps (GCAT) du Télescope James Clerk Maxwell (TJCM) a tenu sa rencontre semi-annuelle à Ottawa les 26/27 novembre, 1994.

Ses membres sont:

JCMT Results of the meetings of CTAG (27 Nov.'94) and of ITAC (6 Dec.'94).

Rapport des résultats des rencontres GTAC (27 nov' 94) et ITAC (6 dec' 94).

Successful Canadian JCMT Proposals  
Semester 95A (Feb.'95 to Jul. '95)

Demandes de temps au TJCM couronnées  
de succès  
Semestre 95A (Fév.'95 à Juillet '95)

Ref.	Principal Investigator	Allocation in 8hr shifts	No. M95A- Principal	Investigateur	Allocations de périodes de 8h
=====					
C01	Welch G A	2			+ < =3 addit. if Rx B3 not there in July
C02	Mitchell G F	5			
C03	Naylor D A	4			FTS (backup not approved)
C04	Matthews H E	4			RxG
C05	Thornley M D	2			
C06	Vallee J P	2			
C07	Papadopoulos P	4			thesis status/thèse
C09	Vallee J P	4			
C10	Lee S -W	2			thesis status/thèse
C13	Bastien P	1			
C14	Matthews H E	3.5			RxG
C15	McCutcheon W H	3			
C16	Matthews H E	1			serviced/en service
C17	Avery L W	5			
C21	Scott D	2.5			
C23	Moriarty-Sch G	3			
C25	Clark T A	1			in 4 x 1/4 shifts
C26	Wilson C D	2			
C27	Pudritz R E	1			
C28	Wilson C D	1			
C29	Howe J E				approved backup for 5 shifts in RxG
Canserv	CN Service Obs	8			Observations in absentia
Interf.	CSO payback	2			SBI repayment
=====					
		Total:	63		

I thank all those who submitted proposals to the JCMT, and all the members of the Canadian Time Allocation Group, for their efforts.

Je remercie tous ceux qui ont soumis des demandes de temps au TJCM, et tous les membres du Groupe Canadien d'Allocation de Temps, pour leurs efforts.

J.M. MacLeod,  
(johnm@hiaras.hia.nrc.ca)  
Leader, JCMT Group, HIA, NRCC-Ottawa  
Chef, Groupe TJCM, IHA, CNRC-Ottawa

## JSSA Report

The Joint Sub-committee for Space Astronomy (JSSA) met for its regular autumn meeting at the Dominion Astronomical Observatory (DAO) on October 23/24 1994. Members attending were:

Denis Leahy (UCal, Chairman), George Mitchell (St-Mary'sU), Slavek Rucinski (ISTS), Henry Mathews (JCMT), Simon Lilly (UTor) and Nicole St-Louis (UMon). Gerry Atkinson (CSA) attended in an ex-officio capacity and Bob Hum (CSA), John Hutchings(DAO), Jim Hesser (DAO) and Denis Crabtree (DAO) attended as guests.

### SciSat

As part of its newly approved Long Term Space Plan (LTSP, 1994-2004) the Canadian Space Agency (CSA) announced the future launch of two small scientific Satellites (SciSat) with the Pegasus XL rocket (1000 lb in low earth orbit). The announcement of opportunity will be made by CSA in early 1995 to solicit proposals from Canadian astronomers. For more information, see the electronic notice sent to all CASCA members by W.E. Harris and S. Rucinski or contact the chairman of JSSA.

### FUSE

After the decision by NASA to cut the Delta class Explorer missions, the Far-Ultraviolet Space Explorer (FUSE) team decided to restructure it as a MIDEX mission, with a budget cap of 100 million dollars. JSSA fully endorses the current Canadian participation in this redesign process. In this restructured FUSE, Canada would most likely still provide the FES and baffle system and therefore most of the phase B work would still be useful. The majority of the scientific goals are expected to be retained but the nominal lifetime and the efficiency of the satellite will be slightly reduced. Furthermore, the spectral coverage is also expected to be reduced to ~930-1170 Å with R~30000. Once the new design is approved by NASA, it will be submitted to JSSA for final approval.

### ODIN

Canada's involvement in the Swedish astronomy/aeronomy satellite ODIN is progressing well. The planning of the observing program will be made by a team of ODIN scientists of which Canada will provide 6 astronomers and 6 aeronomers. An open competition has recently been held through

CASCA to select the 6 Canadian ODIN astronomers. The CSA contribution to the project consists in the building of an optical spectrometer, the testing of the attitude control system and the sharing of common costs such as the launch, etc.

### RadioAstron/VSOP

Because of the recent political and economic events in Russia, the launch of Radioastron has been delayed to 1997 or even 1998. On the other hand, the Japanese VSOP mission is progressing well and will very likely be launched in September 1996. With the support of CASCA's radio astronomy committee, JSSA recommended to the CSA that resources of Radioastron be reallocated to VSOP. The technical development of high speed recording and correlation devices which was carried out with the support of CSA for Radioastron will serve as the Canadian contribution to the VSOP mission. The recorders and correlators could be redirected back to Radioastron after VSOP, pending schedules for both missions.

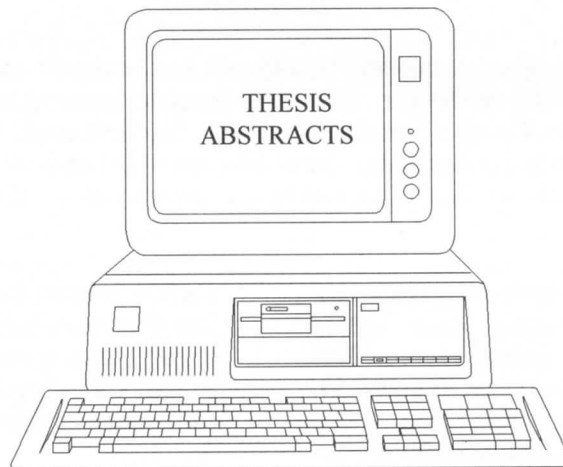
### Euvita/Spektrum-X

The Canadian commitment to this mission is essentially completed. The 40 MB Solid-State memory and some ICs (chips) have been delivered. Canada also continues to support Euvita calibration.

### Possible future missions

The following missions were presented to JSSA and discussed for possible future involvement: participation in the HST Advanced Camera, Lunar Ultraviolet Telescope, JUNO ultraviolet sky survey, GSFC Hitchhiker and STARS.

Denis Leahy, Chairman  
([leahy@iras.ucalgary.ca](mailto:leahy@iras.ucalgary.ca))  
George Mitchell  
Slavek Rucinski  
Henry Mathews  
Simon Lilly  
Nicole St-Louis



(None this Issue)



**CANADIAN ASTRONOMY PUBLICATIONS**  
**September 19 to December 16, 1994**

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**A. PREPRINTS OF RESEARCH PAPERS**

The following is a list of preprints written by Canadian astronomers and received at the Astronomy library within the dates given above. The preprints are arranged in alphabetical order according to the surname of the first listed author. Originating institution and date of receipt at the library are given.

- Dominion Radio Astrophysical Observatory National Research Council of Canada Annual Report October 1994.* DRAO. 15-Dec-1994
- Allard, F.; Hauschildt, P.H. *Model atmospheres for M (sub)dwarf stars I. The base model grid.* UBC. 25-Nov-1994
- Allard, F.; Hauschildt, P.H. *M (sub)dwarf model atmospheres: the next generation (abstract only)* UBC. 28-Sep-1994
- Baribault, R.; Pineault, S. *Effects of realistic AGB mass loss on degenerate binary star systems.* Obs. Mont Megantic. 8-Nov-1994
- Borra, E.F.; Moretto, G.; Wang, M. *An optical corrector design that allows a fixed telescope to access a large region of the sky.* U Laval. 13-Oct-1994
- Borra, E.F. *Liquid mirrors : a review.* U Laval. 14-Nov-1994
- Coziol, R.; Demers, S. *MBG survey: the mode of star formation of SBNGs.* Obs. Mont Megantic. 8-Nov-1994
- Doyon, R.; et al. *Stellar velocity dispersion in Arp 220 and NGC 6240 - elliptical galaxies in formation.* Obs. Mont Megantic. 14-Oct-1994



- Evans, N.R. *Classical cepheids with TAMS companions: constraints on evolution*. ISTS York U. 24-Oct-1994
- Evans, N.R. *The mass ratios of cepheid binaries*. ISTS York U. 24-Oct-1994
- Evans, N.R.; Massa, D.; Teays, T.J. *S Mus B revisited*. ISTS York U. 24-Oct-1994
- Fernandez-Castro, T.; Seaquist, E.R.; et al. *The active phase of the hot component of Z Andromedae*. VILSPA. 15-Nov-1994
- Freedman, W.L.; et al. *Distance to the Virgo cluster galaxy M100 from Hubble Space Telescope observations of cepheids*. Obs. Carnegie Inst. 27-Oct-1994
- Gray, D.F.; Baliunas, S.L. *Magnetic activity variations of epsilon Eridani*. UWO. 17-Nov-1994
- Gray, D.F. *Spectral line-depth ratios as temperature indicators for cool stars*. UWO. 7-Dec-1994
- Hickson, P.; et al. *UBC/Laval 2.7-meter liquid mirror telescope*. UBC. 19-Oct-1994
- Hutchings, J.B.; Crampton, D.; Johnson, A. *Companions of QSOs at redshift 1.1*. DAO. 12-Oct-1994
- Iverson, R.J.; Seaquist, E.R. *Multi-frequency observations of K3-9 - a new radio luminous symbiotic Mira*. ROE. 14-Dec-1994
- Jaffe, A.H.; Kaiser, N. *Likelihood analysis of large-scale flows*. CITA. 21-Sep-1994
- Kaiser, N.; Squires, G.; Broadhurst, T. *A method for weak lensing observations*. CITA. 10-Nov-1994
- Kaiser, N.; et al. *Recent developments in weak lensing*. CITA. 10-Nov-1994
- Kary, D.M.; Lissauer, J.J. *Nebular gas drag and planetary accretion II: Planet on an eccentric orbit*. U Cal/Santa Barbara. 30-Nov-1994
- Kurtz, D.W.; Garrison, R.F.; et al. *Metallicism and pulsation: the discovery of large amplitude delta Scuti pulsation in a high-metallicity rho Puppis star HD 40765*. DDO/U of T. 9-Nov-1994
- Leahy, D.A. *Five eclipses of Hercules X-1 observed by GINGA (abstract only)* U Calgary. 21-Nov-1994
- Leahy, D.A.; Volk, K. *ROSAT PSPC observations of the symbiotic CH Cygni*. U Calgary. 21-Nov-1994
- Leahy, D.A.; Yoshida, A.; Matsuka, M. *Spectral evolution during pre-eclipse dips in Her X-1 (title page only)* U Calgary. 21-Nov-1994
- Levin, J.J. *Inflation from extra dimensions*. CITA. 10-Nov-1994
- Lilly, S.J.; et al. *The Canada-France Redshift Survey and the evolution of the galaxy luminosity function to high redshift*. DDO/U of T. 24-Oct-1994
- McLaughlin, D.E.; et al. *Washington photometry of the globular cluster system around NGC 3311. II. Spatial structure and mass spectrum*. McMaster U. 2-Dec-1994
- Merryfield, W.J. *Hydrodynamics of semiconvection*. U Victoria. 6-Dec-1994
- Morris, S.L. *Lyman alpha absorption and tidal debris*. DAO. 12-Oct-1994
- Nelson, R.W.; et al. *A potential cyclotron line signature in low luminosity X-ray sources*. CITA. 20-Oct-1994
- Perelmuter, J.-M.; Racine, R. *The globular cluster system of M81*. Obs. Mont Megantic. 8-Nov-1994
- Pogosyan, D.; Starobinsky, A. *Mixed cold-hot dark matter model with falling and quasi-flat initial perturbation spectra*. CITA. 10-Nov-1994
- Reed, B.C.; Garrison, R.F. *Spectral type - Q calibration for OB stars*. DDO/U of T. 9-Nov-1994
- Rogers, C.; Heyer, M.H.; Dewdney, P.E. *HI, CO, and IRAS observations of NGC 7023*. DRAO. 15-Dec-1994
- Secker, J.; et al. *Washington photometry of the globular system around NGC 3311. I. Analysis of the metallicities*. McMaster U. 2-Dec-1994
- Secker, J.; Lepock, J.; Wesson, P. *Damage due to ultraviolet and ionizing radiation during the ejection of shielded micro-organisms from the vicinity of 1 mo main sequence and red giant stars*. McMaster U. 2-Dec-1994
- Short, C.I.; Lester, J.B. *Missing opacity in atmospheric models of red giants*. DDO/U of T. 26-Sep-1994
- Starkman, G.D.; Spergel, D.N. *A new technique for detecting supersymmetric dark matter*. CITA. 20-Oct-1994
- Syer, D.; Tremaine, S. *Lattice stellar dynamics*. CITA. 21-Sep-1994
- Touma, J.; Wisdom, J. *Evolution of the earth-moon system*. CITA. 8-Nov-1994
- Walker, G.A.H.; et al. *The absence of Jupiter-mass companions to near-by stars (abstract only)* UBC. 11-Oct-1994

## B. Publication

*Early astronomy / Hugh Thurston. -- New York : Springer-Verlag, 1994*



## CANADIAN ELECTRONIC ADDRESSES

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