

# Cassiopeia

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CASSIOPEIA

Canadian Astronomical Society/  
Société Canadienne d'Astronomie



# Cassiopeia

No. 39 Summer Solstice 1983

## CANADIAN ASTRONOMICAL SOCIETY SOCIÉTÉ CANADIENNE D'ASTRONOMIE

Editor: Colin Scarfe, University of Victoria

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### EDITORIAL

It is with some relief that I put aside my role as local chairman for last week's joint annual meeting with CAP, and resume the more familiar one of editor of Cassiopeia. The deadline for this issue, as you will recall, was delayed so as to follow the meeting, which accounts for the late mailing date. As you will see below the tradition of issuing Cassiopeia close to the equinox and solstices will resume in September.

A few comments on the meeting, before it fades (some of it mercifully!) from my memory.

1. The poster paper session attracted lots of interest, and much favourable comment both from authors and visitors. I have in a previous editorial argued the merits of posters, and suspect that there are now a few more who would agree with me. Although there were, and probably always will be, a few papers that are quite unsuitable for poster presentation, I would urge future hosts of CAS annual meetings to set aside time for poster sessions, avoiding conflicting activities. It may well be that many authors will opt for posters!

2. Alas I didn't get to many of the sessions, but did manage to take in a brilliant, and humorous, R.M. Petrie lecture by Mirek Plavec. This was preceded by shorter talks of similar excellence by the two CAP medallists. This opportunity to hear three such superb talks in a single morning is a good argument for future joint meetings with CAP despite the work such meetings entail.

3. I think it was instructive for the physicists to see how much is going on in Canadian astronomy. The meetings of the CFHT users, and on CLBA, CITA and STARLAB served to bring home the fact that the CAS meeting was perhaps even harder to cram into three days than was the CAP's.

With this meeting, the terms of office of secretary Richard Bochonko and treasurer Bill McCutcheon have come to an end. They have both served the Society well and deserve our heartfelt thanks. As editor I have had frequent contact with both throughout their terms, Richard as perhaps the largest contributor to these pages, and as the supplier of an up-to-date set of addresses for each issue, and Bill of course as the one who paid the costs of producing Cassiopeia, a major part of the annual expenditure of the Society. I have had extremely good relations with both Richard and Bill, and want to record here my personal gratitude.

Finally I should like to thank Doug Hube, who has recently resigned as associate editor, for his cooperation and assistance in the task of producing this quarterly newsletter. In particular I should like to recall that during my sabbatical in 1978-79 he took over as editor and produced five issues in my absence. His help will be much missed, and I hope to find a suitable replacement as soon as possible. I look forward to receiving suggestions from members of names of possible associate editors--or even offers to take on the task!

DEADLINE FOR THE AUTUMNAL EQUINOX ISSUE IS SEPTEMBER 15.

COLIN SCARFE

**REPORT  
of the  
FOURTEENTH MEETING  
of the  
CANADIAN ASTRONOMICAL SOCIETY**

In May, 1971, the founding meeting of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE was held at the University of Victoria. Twelve years later, June 26-30, 1983, again at the University of Victoria, another founding meeting was held. This time it was the first meeting of the newly incorporated Society. This gave rise to two Annual General Meetings: the last one for the unincorporated Society which was dissolved and the first for the incorporated Society.

If you weren't in Victoria for this special occasion you missed a really good time. The meeting was a very successful joint meeting with the Canadian Association of Physicists, the first since the summer of 1974. The seventy members of CASCA were outnumbered by a factor of four by the physicists but we felt no ill effects. In fact, the joint aspect of the meetings produced some very happy exchanges, especially at the excellent barbequed salmon banquet held at Royal Roads Military College.

The highlight of the invited presentations was a Plenary Session held on Wednesday, June 29. Dr. W. G. Unruh, winner of the CAP Herzberg Medal presented a very lucid talk on the possibilities of detecting gravity waves. Dr. P. A. Egelstaff, winner of the CAP Medal for Achievement in Physics reviewed Neutron Scattering Studies of Liquids and Dense Gases. The CASCA Petrie Lecturer, Dr. M. J. Playec recounted the trials and tribulations of a stellar eclipse hunter while telling us about Strongly Interacting Binary Stars. There were also many invited speakers speaking on topics ranging from Optics in Space to Manpower for R&D in the 80s.

A very important aspect for CASCA was the series of open meetings dealing with the Canadian Long Baseline Array proposal, the Canadian Institute for Theoretical Astrophysics proposal, the STARLAB proposal and the Canada-France-Hawaii Telescope. Reports of these open meetings will be published in Cassiopeia.

Another first for a meeting of CASCA was the presentation of over half of the contributed papers by poster sessions. There were 14 papers presented orally. The quality of the presentations, both orally and by poster was excellent.

The Minutes of the two Annual General Meetings are to be found elsewhere in this issue.

The Society owes many thanks to Colin Scarfe and the members of the Local Organizing Committee for planning such a successful joint meeting.

Richard Bochonko  
Secretary

**ANNUAL GENERAL MEETING - 1983**

Final Annual General Meeting of the unincorporated Society  
held during the  
Fourteenth Meeting of the Canadian Astronomical Society  
at

The University of Victoria, Victoria, B.C.  
Room 167, Elliott Building  
Wednesday, June 29, 1983

1. CALL TO ORDER - Vic Gaizauskas, President of the Society, called the meeting to order at 1105 PDT with about 70 members present.
2. APPOINTMENT OF SCRUTINEERS FOR COUNTING OF THE BALLOT - Gaizauskas appointed Pim Fitzgerald and Tom Kuiper as scrutineers for the counting of the ballot.
3. CONSIDERATION OF THE MINUTES OF THE ANNUAL GENERAL MEETING HELD IN TORONTO ON JUNE 4, 1982 - Bochonko moved, seconded by Bob McLaren

MOTION 1

that the minutes of the Annual General Meeting held in Toronto on June 4, 1982 be accepted as published in Cassiopeia.

The motion carried.

4. BUSINESS ARISING OUT OF THE MINUTES

a) INCORPORATION OF THE SOCIETY - Gaizauskas reported that the application for incorporation of the Society had been approved by the Department of Consumer and Corporate Affairs of the Government of Canada. The provisional Board of Directors had their first meeting on Sunday, June 26, 1983, at which time a number of formal motions were passed including a motion electing to membership of the incorporated Society all members of the unincorporated Society. Gaizauskas also pointed out that at the end of this meeting a formal motion will be presented to transfer all assets of the unincorporated Society to the incorporated Society and to dissolve the unincorporated Society. All other questions on the incorporation were set aside until the First Annual General Meeting of the incorporated Society held immediately after this meeting.

b) CANADIAN INSTITUTE FOR THEORETICAL ASTROPHYSICS PROPOSAL - Gaizauskas reported on actions taken by the Council with regard to the proposal to establish the Canadian Institute for Theoretical Astrophysics. He reported that Council had unanimously approved two motions: one, reaffirming general support of the proposal; and, the other, outlining procedures and structures for the formation of the CITA Council.

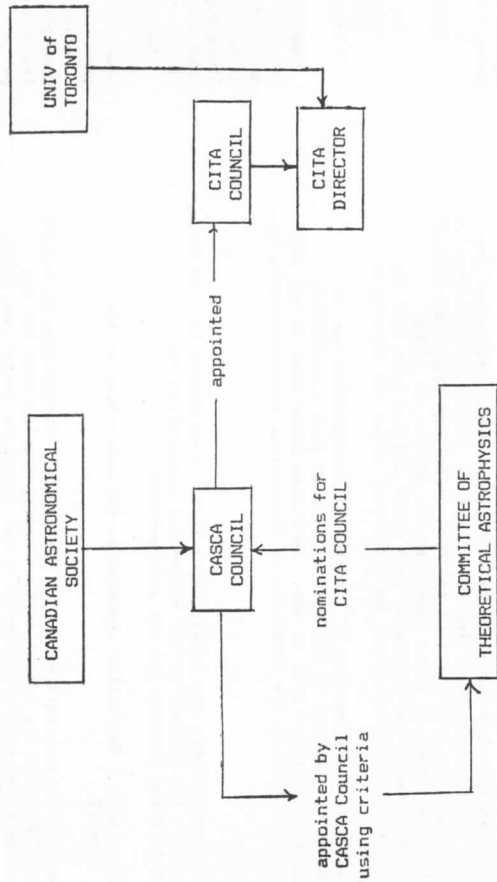
In order to obtain the approval of the entire membership, Dick Henriksen moved, seconded by Mike Marlborough, the same motion that had been approved by Council.

MOTION 2

that the Canadian Astronomical Society is pleased by the approval awarded, by NSERC and NRC, to the scientific stature, scientific objectives and the national image of the Canadian Institute for Theoretical Astrophysics concept. CASCA wishes, at this time, to reaffirm its earlier support for this pioneering project, which will be a continuing stimulus for Canadian astronomy.

Andy Woodsworth speaking in support of the motion indicated that it was important for the astronomical community to show continued support of the CITA proposal until NSERC funding is finally approved.

The motion carried.  
 Gaizauskas reported that Peter Martin and Dick Henriksen had met with Council during its December meeting and Henriksen alone had met with Council last Sunday. They expressed the need to create an environment for the founding of CITA which would involve as many of the theoretical astronomers in Canada as possible. An organizational flowchart was suggested which looks like the following:



The Committee of Theoretical Astrophysics would be like a committee of the entire community of theoretical astrophysicists, which would involve perhaps 40 members. Council asked that criteria be set up by the theoretical astrophysicists so that the community could be identified. The Committee of

Theoretical Astrophysics will by some means produce a list of nominations for membership of the CITA Council, the governing body of CITA, which will be forwarded to the Council of CASCA. The Council of CASCA would then appoint the members of CITA Council from the list of nominations and add one other member of its choice. Council of CASCA exercises some control by selecting members of CITA Council from a list of names greater than the number of positions and by appointing one additional member who need not have been nominated by the Committee of Theoretical Astrophysics. One of the functions of the CITA Council will be to choose the Director of CITA. The Director will be responsible to the CITA Council and to the School of Graduate Studies of the University of Toronto presuming that that is where the institute will be located.

Gaizauskas then reported on the motion passed by Council which defines the initial procedures and structures for the formation of the CITA Council. Henriksen moved, seconded by Mike Marlborough, the same motion that was approved by Council

MOTION 3

that the following procedures and structures for the formation of the CITA Council be approved:

1. A Committee of Theoretical Astrophysics will be formed. Nominees for membership on the committee shall meet the following criteria:
  - a) Nominee shall be a member of the Canadian Astronomical Society.
  - b) Nominee shall have a Ph.D. or equivalent experience.
  - c) Nominee shall be working at a Canadian university or research laboratory.
  - d) Nominee shall be devoting at least 50% of research time to theoretical astrophysics as demonstrated by recent publications.
- Nominees for the committee will nominate themselves and be approved by the Council of CASCA.
2. The term of membership on the Committee of Theoretical Astrophysics shall be five years.
3. The Committee shall elect its own officers.
4. The Committee shall forward to Council of CASCA, no fewer than six names in nomination for CITA Council.
5. The Council of CASCA shall appoint five members of the CITA Council, four from the nominations submitted by the Committee.

The Council of CASCA will distribute to the members of the Society forms for nomination to the Committee of Theoretical Astrophysics. Members will be asked to nominate themselves.

Bob Garrison asked whether the lengths of term of membership on the Committee of Theoretical Astrophysics would initially be made for 1, 2, 3, 4 and 5 years in order that there be a turnover each year. Henriksen responded that details of that nature had not yet been worked out but some such process would be considered.

Paul Feldman questioned the arbitrariness of the figure of 50% in reference to the amount of research time. He pointed out that there are people who for significant parts of their career could not have met the criteria but who are

nonetheless clearly theoretical astrophysicists. Gaizauskas responded the test for the criteria will be the nature of recent publications which should take care of that problem.

Lloyd Higgs asked whether the Committee of Theoretical Astrophysics had any function other than making nominations for CITA Council. He wondered whether it might eventually become like a Division of the AAS. Henriksen responded that it could evolve that way although it would depend on the desires of CASCA. Gaizauskas noted that Council had discussed this point and had felt that the formation of Divisions in CASCA would not be beneficial while the Society is still as small as it is.

Bryan Andrew asked if the Committee of Theoretical Astrophysics was an advisory committee to the Council of CASCA and if it was just a nominating committee. Gaizauskas responded that it was. Henriksen added that it had the further function of identifying the community of theoretical astrophysicists in Canada.

The motion carried.

5. CORRESPONDENCE - Bochonko noted the receipt of a letter from Andrew Leir of Allan and Louheed informing the Society of the successful application for incorporation and that the Society was now incorporated.

6. REPORT FROM THE PRESIDENT - Gaizauskas reported on the activities of the President and of Council.

- a) Doug Hube has resigned as associate editor of Cassiopeia. Gaizauskas, on behalf of the Society and Colin Scarfe, editor of Cassiopeia, thanked Hube for his services. Gaizauskas noted that a search for a new associate editor has begun.
- b) The membership of the Education, Manpower and Employment Committee, the Radio Astronomy Committee and the Heritage Committee have been reconstituted. The new memberships have been published in Cassiopeia. Gaizauskas announced that Arthur Covington has been appointed as a new member to the Heritage Committee.
- c) In regards to the Heritage Committee, Gaizauskas announced that Vic Hughes has been successful in having the province of Ontario recognize the first astronomical observatory in Ontario, i.e. the Kingston Observatory. It will be commemorated with a plaque in 1985.
- d) The Associate Committee on Astronomy of NRC has completed their Priorities Report but it has not yet been distributed. It was completed before the end of 1982 but there have been delays in publication and in translation.

e) Gaizauskas announced that the Associate Committee on Astronomy has been reconstituted and the new Committee will be holding its meeting in Victoria on June 30, 1983. Most of the nominations made by the Council of CASCA were accepted. Georges Michaud is the new chairman of the Committee.

f) Ian McDiarmid of the Canada Centre for Space Science (at the December meeting) and Jim Hesser (at the June meeting) reported to Council about the progress on the STARLAB proposal.

- g) Gaizauskas reported that much time has been devoted by the President and by the Council on the CLBA proposal. The current outlook for the proposal is very good. Council unanimously approved the following motion:

MOTION APPROVED BY COUNCIL

The Council of the Canadian Astronomical Society supports the submission to the Natural Sciences and Engineering Research Council by the CLBA Planning Committee of a proposal for a Collaborative Special Projects Grant.

Gaizauskas reported on the background behind the motion. The National Research Council unanimously approved the CLBA proposal on May 31, 1983. This means that the President of NRC was given the authority to take to the Minister of Science the recommendation that the CLBA proposal, as outlined in the Cost Study Report, be funded. A cabinet document will be prepared by NRC for submission to the Minister and nothing much is expected to happen before the fall at the earliest.

Because of this approval, the CLBA Planning Committee has decided to begin some more detailed design of the CLBA. In order for the Committee to function, there is a need for funding for travel, for teleconferences and telephone expenses.

Gaizauskas also reported that Ernie Seaquist, chairman of the CLBA Planning Committee, has been devoting a great deal of his time to CLBA activities and with the new developments the chairman will have to devote even more time to the project. Seaquist felt that, because of his teaching and administrative commitments, he would not be able to devote the time necessary for the chairmanship and offered his resignation. This was considered by the Radio Astronomy Committee and was in effect turned down. Everyone appreciates the job that Seaquist has been doing. He has won the confidence of the astronomical community and various authorities in Ottawa. He has established contacts in Provincial offices throughout Canada and with industry which are invaluable.

There is a proposal that money be obtained which would help relieve Seaquist of his teaching and administrative duties. The need for funding for the CLBA Planning Committee operation and for the relief of Seaquist have been discussed with NSERC and a letter of intent to apply for a Collaborative Special Projects Grant and for special funding to support Seaquist in his role as Chairman of the CLBA Planning Committee has been forwarded to NSERC.

John Galt moved, seconded by Chris Purton

MOTION 4

that the Canadian Astronomical Society supports the submission to NSERC of a proposal for a Collaborative Special Projects Grant for the CLBA Planning Committee and the submission to NSERC of a request for funds in support of the chairmanship of Dr. E. Seaquist of the CLBA Planning Committee.

The motion carried.

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h) Gaizauskas reported some of the comments made by Bob Garrison, former chairman of the CFHT Subcommittee of the ACA, in a letter to Council (letter is attached as Appendix B to the Minutes of the 27th Council Meeting), with regards to the membership of the CFHT Subcommittee. Garrison indicated that, while the duality of ACA and CASCA exists, it is suggested that the Subcommittee report to both. He also suggested that the membership of the Subcommittee can easily be chosen and adequately rotated if it consists of the four members of the CFHT Scientific Advisory Committee, the two astronomer members of the Board of Directors of the CFHT and the two Canadian Astronomers on the staff of CFHT. He suggests that the chairman of the Subcommittee be chosen by and from among the members.

7. REPORT FROM THE SECRETARY - Bochonko announced the new members approved for membership in the Society since the last AGM. A list of the new members is attached as Appendix A to these Minutes.  
Bochonko also reported that a new edition of the membership list would be published early this fall.

8. REPORT FROM THE TREASURER

a) FINANCIAL STATEMENT - McCutcheon presented the Financial Statement as of March 31, 1983. (A copy of the statement is attached as Appendix B of these Minutes.) McCutcheon moved, seconded by Tom Landecker

MOTION 5

that Financial Statement be accepted.

The motion carried.

McCutcheon expressed, on behalf of the Society, thanks to Phil Gregory, auditor for the last two years.

b) PROPOSAL FOR A SMALL GRANTS PROGRAM - McCutcheon noted that the bank balance held by CASCA was increasing at a slow but steady rate and that Council has been considering whether there are some programs that could be funded with the money. McCutcheon reminded the membership that if the Society were not subsidized by the voluntary efforts of members of Council and others; and, the free use of space and services of various institutions; then the Society would very quickly use up the money that was currently in the bank.

McCutcheon reported that he, Chris Pritchett and John MacLeod were appointed to a Committee to investigate the possibility of instituting some sort of Small Grants Program. The Committee will be asking through Cassiopeia for suggestions and information on the need for such a program.

John Percy commented that the AAS has a Small Grants Program that is operating and wondered whether the introduction of such a program in CASCA would make Canadian astronomers ineligible for the AAS grants. McCutcheon indicated that he did not know but saw no reason for any change in eligibility.

Sun Kwok pointed out that Canadians qualify for the research component of the AAS Small Grant Program but not the travel component.

Sidney van den Bergh asked whether Council has considered the possibility of

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reducing the dues. Gaizauskas responded that Council has indeed considered reducing the dues. The dues were raised just recently due to increased costs. It does not seem appropriate to change the dues again and run the risk of having financial difficulties. He pointed out that the increase in the money held by the Society may not continue, but if it should, then the attitude is that the money should be used to help individuals in need.

Bob Garrison expressed his support for the idea of a Small Grants Program. He felt that most members can afford the \$30 dues and he liked the idea that the Society support the research or travel of the young astronomers who can't afford it.

Colin Scarfe commented that the apparently large increase in the bank balance this year may just be a statistical effect and may not signify a continuing trend.

9. REPORT FROM THE HERITAGE COMMITTEE - Ed Kennedy presented the report of the Heritage Committee. (The text of the report is attached as Appendix C of these Minutes.) Kennedy moved, seconded by Mary Grey

MOTION 6

that that the report of the Heritage Committee be accepted.

The motion carried.

10. REPORT FROM THE RADIO ASTRONOMY COMMITTEE - Purton presented the report of the Radio Astronomy Committee. (The report is attached as Appendix H to the Minutes of the 28th Council Meeting.) Purton presented the recommendations of the Radio Astronomy Committee.

The first recommendation reads:

RECOMMENDATION 1

We recommend that the Canadian Astronomical Society forward a communication to all agencies which might be involved in a consortium type of management for the proposed CLBA, in particular, the National Research Council, the Department of Energy, Mines and Resources, and the appropriate Canadian universities (specifically the University of Alberta, the University of British Columbia, L'Université de Montréal, Queen's University at Kingston, the University of Toronto, and York University, who have approached the President of NRC, as well as Lakehead University, Memorial University, the University of Lethbridge, the University of Calgary and the University of Manitoba, who have also expressed an interest in the project), pointing out that the time scale for setting up such a consortium might be long and that planning for other aspects of the project, including the request to the Minister for funding, is proceeding at a reasonable pace. The agencies that may be interested in forming a consortium should be urged to begin preliminary discussions. Such discussions need not prejudice the final decision on the type of management for the CLBA, but would in fact keep open both

options that were recommended by the CLBA Planning Committee.

Council will act on Recommendation 1 by writing to the appropriate agencies and reminding them of the need for quick action on their part if they are interested in a consortium type of management for the CLBA. It will be suggested that University presidents and / or Deans of Science place the consideration of this question on the agenda of their next national meeting. The CLBA Planning Committee and the Radio Astronomy Committee have expressed a willingness to send representatives to any meeting to provide information and help. The second recommendation from the Committee reads as follows:

#### RECOMMENDATION 2

The Radio Astronomy Committee unanimously and enthusiastically recommends that Dr. E. R. Seaquist be asked to continue as chairman of the CLBA Planning Committee. The confidence that Dr. Seaquist has generated at NRC, NSERC, ENMR, the Canadian universities, a variety of industrial organizations, and NRAO, is invaluable to the project. We further recommend that the Canadian Astronomical Society forward a letter to NSERC in support of any application made to them by Dr. Seaquist for additional funds which could be used to relieve him of teaching and administrative duties at the University of Toronto and thus allow him to devote a greater fraction of his time to the CLBA project.

Council acted upon Recommendation 2 by passing the following motion

#### MOTION APPROVED BY COUNCIL

The Council of the Canadian Astronomical Society supports the application to NSERC made by Dr. E. Seaquist for additional funds which could be used to relieve him of teaching and administrative duties at the University of Toronto and thus allow him to devote a greater fraction of his time to the CLBA project.

This meeting passed Motion 4 earlier with the same intent.

Dr. Jack Locke requested that the Council of CASCA provide a list of names from which members of a committee representing the users of the 46 metre telescope at the Algonquin Radio Observatory could be drawn. This request was referred to the Radio Astronomy Committee. The Radio Astronomy Committee has given a list of names to the Council of CASCA which will be forwarded to Dr. Locke.

The third recommendation reads (with one modification from Council):

#### RECOMMENDATION 3

The Radio Astronomy Committee suggests that, in addition to the Users Committee, NRC consider the formation of a committee involved with the operation of ARO and DRAD modelled after the NRAO 'Visiting Committee'. It would be charged with assisting in the planning of, and evaluating

the performance of, ARO and DRAD, particularly with regard to their role as national facilities. It would make recommendations to the President of NRC, or to the appropriate Vice-President. The recommended structure for such a committee would include:

- a) at least one member from outside Canada,
- b) both technical and operational expertise represented,
- c) members not necessarily users of the facility, and
- d) committee budget provided by NRC.

Council accepted Recommendation 3 by a unanimous vote.

The final recommendation from the Committee reads:

#### RECOMMENDATION 4

We urge that NRC make vigorous attempts to increase the manpower available at ARO in order to make good use of a resurfaced 46 metre dish. Possible ways of increasing the effective number of personnel include the following:

- a) making a strong case for the importance of additional person-years for the project,
- b) working cooperatively with Canadian universities on the project, and
- c) working cooperatively with NRAO, Bell Labs, the University of Massachusetts or other American institutions on the project.

Council accepted Recommendation 4 unanimously.

Purton moved, seconded by Lloyd Higgs

#### MOTION 7

that the Report of the Radio Astronomy Committee be accepted.

The motion carried.

11. ANNOUNCEMENT OF THE RESULT OF THE ELECTION - Bochonko reported that, in the mail ballot, Mike Marlborough was elected to the Council of CASCA and that Chris Aikman and John Climenhaga were elected, by acclamation, to the positions of Secretary and Treasurer, respectively. The incoming council along with the year when each member's term expires is listed below:

President	- Victor Gaizauskas, H.I.A.	1984
1st Vice President	- John M. MacLeod, H.I.A.	1984
2nd Vice President	- Ernie Seaquist, U. of Toronto	1984
Secretary	- Chris Aikman, D.A.O.	1986
Treasurer	- John Climenhaga, U. of Victoria	1986
Councillors	- Alan Bridle, N.R.A.O.	1984
	- Mike Marlborough, U. of Western Ontario	1986
	- Christopher Pritchett, U. of Victoria	1984
Past President	- Gordon. A. H. Walker, U.B.C.	1984

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12. MOTION TO DISSOLVE THE UNINCORPORATED CANADIAN ASTRONOMICAL SOCIETY - Bochanko moved, seconded by McCutcheon

MOTION 8

Be it resolved that the CANADIAN ASTRONOMICAL SOCIETY / SOCIETE CANADIENNE D'ASTRONOMIE (unincorporated) transfer its assets to the CANADIAN ASTRONOMICAL SOCIETY / SOCIETE CANADIENNE D'ASTRONOMIE (incorporated) and that the unincorporated society be dissolved at the adjournment of this meeting.

The motion carried unanimously.

13. MOTION TO ADJOURN - The meeting adjourned at 1223 PDT.

Appendix A 1983 AGM Unincorp.

New Members Announced 29 June 1983

DUNCAN, Martin James (M). 416 - 284 3318  
Scarborough Campus, University of Toronto, 1265 Military Trail,  
Scarborough, ON M1C 1A4

HOLMGREN, David Eric (S) 403 - 436 2398  
150 Laurier Drive, Edmonton, AB T5R 5P9

MCALARY, Christopher W. (M) 602 - 626 2832  
Steward Observatory, University of Arizona  
Tucson, AZ 85721 U.S.A.

WINKOV, Zoran (S) 604 - 228 6722  
Department of Geophysics & Astronomy, University of British Columbia  
Vancouver, B.C. V6T 1W5

PALMER, Leigh Hunt (M) 604 - 291 4844  
Physics Department, Simon Fraser University, Burnaby, B.C.  
V5A 1S6

PUDRITZ, Ralph Egon (M) 415 - 642 5016  
Astronomy Department, University of California, Berkeley, CA  
94720 U.S.A.

REDMAN, Russell Ormond (M) 213 - 354 6806  
Jet Propulsion Laboratory, 4800 Oak Grove Drive, TR-1166, Pasadena, CA  
91106 U.S.A.

ROBB, Russell M. (M) 604 - 721 7750  
Department of Physics, P.O. Box 1700, University of Victoria  
Victoria, B.C. V8W 2Y2

ROGERS, Christopher (M) 617 - 495 7231  
Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138  
U.S.A.

SCHIEVEN, Gerald Henry (S) none given  
Department of Physics, Queen's University  
Kingston, ONT

TAYLOR, Andrew Russell (M) none given  
Department of Astronomy, University of Toronto  
Toronto, ONT M5S 1A7

VANDENBERG, Don Allan (M) 704 - 721 7739  
Department of Physics, University of Victoria  
Victoria, B.C. V8W 2Y2

Appendix B 1983 AGM Unincorp.

Auditor's Report

*This financial statement appears with the records submitted by the Treasurer and is considered to be a true statement of the financial transactions of the Canadian Astronomical Society from 1982 March 31 to 1983 March 31.*

*F.C. Sneyd*

*Auditor 1983 June 21.*



CANADIAN ASTRONOMICAL SOCIETY  
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Financial Statement as of March 31, 1983

This statement details the business transacted since the last audited Financial Statement, March 31, 1982. Figures for the previous year are in italics in left hand column.

Balance as of March 31, 1982	\$ 24,924.72
<u>INCOME</u>	
Membership dues (includes \$26.29 exchange)	\$ 5,468.29
Interest - Savings Account	1,172.27
- Term Deposit	1,351.23
- Guaranteed Investment Certificate	855.86
- C.S. Beals Fund	278.57
C.S. Beals Fund Contributions	-----
C.A.S. grant plus interest returned from CNC/IAU	-----
N.R.C. contribution to Cassiopeia	-----
Profit from Toronto C.A.S. meeting	156.84
<u>18,478.05</u>	<u>\$ 9,283.06</u>
<u>31,657.65</u>	<u>\$ 34,207.78</u>
=====	=====

EXPENDITURES

Petrie lecturer honorarium	\$ -----
Petrie lecturer Expenses	400.05
Travel grants	-----
R.A.S.C. Reprints	-----
Scitec	-----
Treasurer's expenses (postage, copying, extra mailing)	388.26
Secretary's expenses	1,200.00
Cassiopeia expenses	-----
Secretarial service for Cassiopeia index	-----
C.A.P. expenses for advertising CLBA	-----
Beals Award	14.00
Bank service charges	513.07
Lawyer's fees - Incorporation	-----
<u>6,732.93</u>	<u>\$ 2,515.38</u>
<u>24,924.72</u>	<u>\$ 31,692.40</u>
=====	=====

Balance held as follows at U.B.C.

Bank of Montreal True Savings Account 5060-336	\$ 15,198.61
Bank of Montreal Chequing Account 1025-082	450.64
Bank of Montreal True Savings Account 5060-360 (C.S. Beals Fund)	2,856.15
Bank of Montreal Term Deposit at 10.0% (Matures May 30/83)	8,000.00
Bank of Montreal Guaranteed Investment Certificate Invested March 29/82 for 2 years at 16.5% (Petrie Fund)	5,187.00
<u>\$ 31,692.40</u>	<u>=====</u>

APPENDIX C  
1983 AGM  
UNINCORP

Third Report of the Heritage Committee  
of CASCA  
presented at the Annual General Meeting  
Victoria, British Columbia,  
29th June, 1983

A heritage Property may be defined as: "....."a work of nature or of man, that is of interest for its architectural, historical, cultural, environmental, aesthetic or scientific value ....."

During 1982-83, the Heritage Committee of the Canadian Astronomical Society has become involved in matters of historical, cultural and scientific interest.

On behalf of all members of CASCA, the President of the Canadian Astronomical Society expressed warm appreciation to the Chairman of the Ontario Heritage Foundation for the decision to erect a plaque to commemorate the Kingstons Observatory.

Congratulations are extended to Dr. Alan Batten for arranging the purchase of the copy of Description de l'Observatoire central de Poulkova by F.G.W. Struve, an excellent addition to the Library holdings of the Dominion Astrophysical Observatory.

Discussions have been held with Mary Grey at the Astronomy Department, National Museum of Science and Technology, about starting an inventory there of old instruments used in astronomy and surveying. The form and the detail of information to be placed on file at the Museum have not been finalized.

Several years ago, a survey of old astronomical instruments was initiated by the Canadian Society for the History and Philosophy of Science. While the survey was not completed, the Secretary-Treasurer of CSHPs has recently made available to the Heritage Committee of CAS the limited information obtained in this earlier work.

Among the historical instruments located this year was a mariner's astrolabe, now housed in the museum operated by the South West Coast Historical Society at Port aux Basques, Newfoundland. A second and quite different astrolabe has turned up among the artifacts held in the collection of Victoria College, University of Toronto. Slides have become available on the circumferentor which was occupying space on a shelf in a basement workshop in Victoria, B.C., and on the small circumferentor privately owned by a resident of Winnipeg.

On the cultural side of the activities of the Heritage Committee, an effort has been made to call attention to the misuse on separate occasions of one of our two official languages by the creation of the terms "archived data and data archiving". While the reference to "archived data" in the International Halley Watch Newsletter originated outside our geographical

boundaries, the reference to "other forms of data archiving" was taken directly from a brochure dealing with the Canadian Long Baseline Array. When this situation was brought to the attention of Dr. Jack Locke, he responded with the encouraging statement: "More of us should join you in a crusade to stop pollution of our language by scientists and engineers."

Among the archival holdings in Canada, the papers of Canadian astronomers of the past and present centuries do not form an extensive section. This limited number of documents has not received a great deal of attention by the archivists in the detailed work of classification and the preparation of an adequate index. This present situation is not helpful to the historians of science.

The members of the Heritage Committee would like to impress upon the members of CASCA the importance of preserving all scientific papers of relevance to the history of Canadian astronomy. It is likewise desirable for members to ensure, as far as possible, that astronomical and surveying instruments find a permanent abode in either a museum or in archives.

Mr. President, you may rest assured that the members of the Heritage Committee would raise no objection whatsoever if the cooperation and support of CASCA members in these activities developed into a crusade.

Submitted by: Chris Aikman  
Mary Grey  
J.E. Kennedy (Chairman)

#### ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE IN CANADA (AASC)

The need for a national science organization has long been recognized. Canada has one now.

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Association for the Advancement of Science in Canada (AASC)  
151 Slater St., Suite 805  
Ottawa, Ontario K1P 5H3

Or Phone (613) 232-0240

### ANNUAL GENERAL MEETING - 1983

First Annual General Meeting of the incorporated Society held during the Fourteenth Meeting of the Canadian Astronomical Society

at  
The University of Victoria, Victoria, B.C.  
Room 167, Elliott Building  
Wednesday, June 29, 1983

1. CALL TO ORDER - Vic Gaizauskas called the meeting to order at 12:23 PDT with about 70 members present.
2. REPORT FROM THE PROVISIONAL BOARD OF DIRECTORS - Gaizauskas reported on the actions taken at the first meeting of the provisional Board of Directors on Sunday, June 26, 1983.

- a) A number of formal motions were passed to initiate the incorporated Society. The first motion passed dealt with membership:

#### MOTION REGARDING MEMBERSHIP

All Ordinary, Student and Corporate Members of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (unincorporated), in good standing, as of the current time and date, are elected to membership in the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (incorporated).

The provisional Board of Directors passed a motion regarding interpretation of the By-Laws of the Society:

#### MOTION REGARDING INTERPRETATION OF BY-LAWS

The By-Laws of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (incorporated) will be interpreted, wherever possible, in the same manner as the By-Laws of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (unincorporated).

The dues for the incorporated Society were set by the following motion approved by the provisional Board of Directors:

#### MOTION REGARDING DUES

The dues for Ordinary, Student and Corporate Membership in the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (incorporated) are the same as currently defined in the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (unincorporated). That is, yearly dues are \$30 for Ordinary Members, \$12 for Student Members and \$75 for

Corporate Members.

A motion was approved by the Directors which established the committees of the incorporated Society.

#### MOTION REGARDING COMMITTEES

The CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (incorporated) appoints committees identical to and with the same composition as those active at this time in the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (unincorporated).

Gaizauskas reported that the Board of Directors discussed the ways and means of running the committees. With the reconstitution of committees recently, it became evident that the Society has to be more specific in instructing committees as to their terms of reference, the length of the terms of office, the manner of reporting to the Board, etc. The Board, by approving the following motion, decided to establish a precedent that the composition of the committees will be reviewed and reappointed if necessary every three years.

#### MOTION REGARDING LENGTH OF TERM OF MEMBERSHIP ON COMMITTEES

The term of membership on committees of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE will be limited to three years beginning with the time of incorporation of the Society.

A member asked whether the motion implied that the committees would be dissolved in their entirety every three years or would there be some sort of revolving scheme. Gaizauskas replied that both ways will be considered and that he felt there should be a regular very thorough review.

Bob Garrison wondered how the motion would affect the suggestions that he made about the composition and rotation of membership for the CPHT Committee. Gaizauskas noted that committees which are joint with the ACA would present problems.

Colin Scarfe wondered whether the Board had considered asking the newly constituted committees to consider their own terms of reference and to bring suggestions to the Board. Gaizauskas replied that such an approach in fact has been taken by the Board.

Sidney van den Bergh asked whether there was any problem with having two classes of committees: ad hoc committees and standing committees. Gaizauskas indicated that there could indeed be a problem.

Garrison commented that in some ways it makes sense to review the committees every year and change them as the Board sees fit. That provides the ultimate flexibility.

b) Gaizauskas reported that Jacques Vallee has undertaken the translation of the By-Laws into french. A first draft is already prepared. This draft will be proofread by a number of the francophone members of the Society. It is hoped that the By-Laws will be published in the next edition of the membership list which should be available in the early fall.

Gaizauskas noted that, in case of the need for a legal interpretation, the english version of the By-Laws will have precedence.

c) Gaizauskas reported on the need for an official seal for the Society. Peter Millman has produced a summary of action on the development of a seal and crest for CASCA. (A copy of this summary is attached as Appendix A to these Minutes.) The logo design incorporates the acronym "CASCA" into the shape of a spiral galaxy. A final design is being developed which has the galaxy form coloured white on an oval dark blue field surrounded by a very fine line, with the words "CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE" between the ring and the oval field. It is hoped that this design will be finished by the end of the summer.

d) Gaizauskas reported that the Board had approved the following motion dealing with membership in the Association for the Advancement of Science in Canada and in the Committee of Parliamentarians, Scientists and Engineers.

#### MOTION REGARDING MEMBERSHIP IN AASC AND COPSE

It is moved that the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE become a member of the Association for the Advancement of Science in Canada and a member of the Committee of Parliamentarians, Scientists and Engineers.

e) Gaizauskas reported that the Board of Directors has instructed the treasurer to apply for Charitable Status for CASCA.

3. ELECTION OF DIRECTORS AND OFFICERS - Bochonko noted that By-Law 5.1 of the Society regarding the first election of the Board of Directors states the following:

At the first meeting of the Corporation, the provisional Directors and officers shall cease to hold office and Directors including officers shall be elected to hold office for terms to be fixed by resolution at the said meeting. Thereafter Directors including officers will be elected by the members of the Corporation pursuant to these by-laws.

In order to establish the new Board of Directors of the Society, Bochonko moved, seconded by McOutcheon

#### MOTION 1

that the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (incorporated) elect as Directors and Officers of the Society, the Councilors and Officers of the CANADIAN ASTRONOMICAL SOCIETY / SOCIÉTÉ CANADIENNE D'ASTRONOMIE (unincorporated) at its dissolution.

The motion carried.

The first Board of Directors for the incorporated Society along with the year

MINUTES AGM (incorp.), June 29, 1983

of the end of their term is:

President	- Victor Gaizauskas, H.I.A.	1984
1st Vice President	- John M. MacLeod, H.I.A.	1984
2nd Vice President	- Ernie Sequist, U. of Toronto	1984
Treasurer	- Chris Aikman, D.A.O.	1986
Councillors	- John Climenhaga, U. of Victoria	1986
	- Alan Bridle, N.R.A.O.	1984
	- Mike Marlborough, U. of Western Ontario	1986
Past President	- Christopher Pritchett, U. of Victoria	1984
	- Gordon. A. H. Walker, U.B.C.	1984

4. CORRESPONDENCE - Bochonko noted the receipt of a letter from Andrew Leir of the law firm Allan & Loughheed informing the Society of its successful application for incorporation. (A copy of this letter is attached as Appendix B of these Minutes.)

5. ELECTION OF AUDITOR FOR 1983-84 - Lloyd Higgs moved, seconded by Andy Woodsworth

**MOTION**

that Jeremy Tatum be elected Auditor for the Society for the year 1983-4

The motion carried.

6. CALL FOR NOMINATIONS TO THE NOMINATING COMMITTEE FOR 1983-84 - Bochonko read By-Law 5.8 regarding Nominating Committee and called for nominations to the Nominating Committee. Nominations are to reach the Secretary by July 29, 1983. It was also announced that the Chairman of the Nominating Committee would be John MacLeod.

7. FUTURE MEETINGS OF THE SOCIETY - Gaizauskas announced that the 1984 AGM will be held in Ottawa at the invitation of the Herzberg Institute of Astrophysics. The 1985 meeting will be held at the University of Toronto at the invitation of the Department of Astronomy as part of the celebration of the 50th birthday of the David Dunlap Observatory.

**8. OTHER BUSINESS**

- Jim Hesser informed the Society that the Astronomical Society of the Pacific awarded the Dorothea Klumpke-Roberts Award to Dr. Helen Sawyer Hogg "for outstanding contributions to the public's understanding and appreciation of astronomy".
  - Gaizauskas thanked the Local Organizing Committee, especially Colin Scarfe, for the excellent arrangements for the joint meeting of CAP and CASCA.
  - Gaizauskas thanked the outgoing members of the Board of Directors, Richard Bochonko as Secretary, Bill McCutcheon as Treasurer and Tony Moffat as Councillor.
9. MOTION TO ADJOURN - The meeting adjourned at 1245 PDT.

National Research Council  
Canada

Conseil national de recherches  
Canada

Herzberg Institute  
of Astrophysics

Institut Herzberg  
d'astrophysique

Ottawa, Canada  
K1A 0R6

10 June, 1983

For Minutes

SEAL AND CREST for the Canadian Astronomical Society - summary of action.

6th Council Meeting - 12 May, 1973. Society Seal Committee appointed, Hogg, Broten, Millman.

8th Council Meeting - 10 June, 1974. 3 designs submitted, deadline for additional designs set at 13 June, 74.

10th Council Meeting - 7 Nov., 1974. 4 designs received, to be submitted to membership for mail vote.

11th Council Meeting - 18 June, 1975. Final report of Seal Committee, (Appendix B to minutes).

5th Business Meeting - 20 June, 1975. Report to membership, quote:-

- "(a) that the acronym CASCA in the form of a spiral galaxy be adopted as the Seal of the Society,  
(b) that the names of the successful proposers, Drs. C.S.Beals, J.F. Heard and P.M.Millman be made known to the Society and that these artists receive the congratulations and thanks of Council,  
(c) that Council should empower any one of them, at their discretion, to seek the services of a professional artist if required to develop the colour scheme and final design to be approved by Council."

11th Council Meeting - 18 June, 1975. Item 10, quote:-

"Millman reported for the seal committee and displayed a slightly modified design for the acronym CASCA. Council were unanimous in preferring the original design as reproduced in Cassiopeia, No. 3, Vernal Equinox, 1974, as this original adheres more closely to the actual outline of M 81."

13th Council Meeting - 16 June, 1976. Item 11, quote:-

"Millman agreed to have notepaper for the Society printed with the CASCA crest at the left of the Society names. -----"

\*\*\*\*\*

Note added by Millman on 10 June, 1983:-

Following the letter from McCutcheon to Gaizauskas, dated May 13, 1983, and recognising that a design for a Society Seal as well as a Crest for notepaper may be required in the near future, immediate action is being taken to produce preliminary drawings for the consideration of the Council. In this action there will be frequent consultations with the President of CASCA, and the Guidelines summarised above will be followed.

P.M.M.

Telex 053-3715  
Télex 053-3715

Cana

Reprinted from Cassiopeia No. 3, Vernal Equinox, 1974.

APPENDIX A  
1983 A4M  
MCOAP

7

A. Proposed New Acronym and a Logo for the Society.

The accompanying design has been submitted by an *ad hoc* committee appointed by the President and includes suggestions made by several members of the Society. The following points were taken into consideration in arriving at this symbol.

1. The acronym C A S C A combines the two official names of the Society. It is also probably unique (which CAS is not - Children's Aid Society for example).
2. The spiral nebula seems to be a good outline for an astronomical symbol. It is more basic and general than one of the much over-worked star shapes or the still more over-worked form of Saturn. It has not generally been used, and the particular spiral chosen here for the outline, M81 at 69° N declination, is certainly suitable for a national society in a country with territory extending far to the north.
3. The close connection of the two abbreviations, CAS and SCA, through the arms of the central letter S symbolizes the complementary and cooperative roles of the two cultures in the development of our nation.
4. The design is simple and, although developed primarily for letter-head and similar uses, lends itself to modification as a lapel pin or brooch should these be desired in the future. It would be easy to incorporate a slightly curved horizontal bar extending across the symbol.



This Committee now asks the membership for comments on

- 1) the letters C A S C A as the official abbreviation or acronym for our Society and
- 2) the submitted design for the seal or logo.

Please send your comments or alternative suggestions to Professor Helen S. Hogg, Chairman of the Society Seal Committee, David Dunlap Observatory, Richmond Hill, Ontario.

\*Logo: Short form of *logotype*, a single piece of type or a single plate faced with a term (as ... an advertiser's trade mark, a company name ...): Webster's Third New International Dictionary.

For your information Richard,  
Bill M:

APPENDIX B  
1983 A4M  
INCOAP

ALLAN & LOUGHEED

BARRISTERS & SOLICITORS  
NOTARIES PUBLIC

SUITE 1500  
777 HORNBY STREET  
VANCOUVER, B.C.  
V6Z 1S9

D. VICTOR ALLAN, B.COMM., LL.B.  
WILLIAM E. LOUGHEED, B.A., LL.B.  
ANDREW A. LEIR, M.A.C., LL.B.  
GORDON J. FRETWELL, B.COMM., LL.B.

TELEPHONE 681-8341

YOUR FILE: 8488  
OUR FILE: 8488

REPLY ATTENTION: Andrew A. Leir

April 25, 1983

Canadian Astronomical Society  
c/o Dr. William H. McCutcheon  
The Department of Physics  
University of British Columbia  
Vancouver, B.C.  
V6T 2A6

Dear Sirs:

Re: Canadian Astronomical Society -  
Societe Canadienne D'Astronomie -  
Incorporation

We are pleased to advise that the Canadian Astronomical Society - Societe Canadienne D'Astronomie has been incorporated under the Canada Corporations Act with Letters Patent dated February 4, 1983. Enclosed herewith are the original Letters Patent with associated Application and By-Laws. We suggest that the documents be preserved with other important documents of the Society and that they be located at the Head Office or with the Society President.

Share  
all this

We understand that the Department of Consumer and Corporate Affairs requires an Annual Report to be filed and a fee of \$30.00 submitted each year to maintain the Society's status. Apparently, the documentation necessary to be filed with the Annual Report will be forwarded to the Head Office at the David Dunlap Observatory in Richmond Hill. We also point out that any by-law amendments must be forwarded to the Department of Consumer and Corporate Affairs for ministerial approval.

The seven signatories to the Application constitute the first members and provisional directors of the Society. We assume that these individuals will enroll the present membership of the unincorporated Society as members in the Corporation pursuant to the provisions of By-Law No. 3. At

APPENDIX B  
1983 AGM  
INCORP

Canadian Astronomical Society  
April 25, 1983  
Page 2

Open Discussion - Formation of a Canadian Institute for  
Theoretical Astrophysics (CITA)

CASCAP '83 Congress, Victoria, B.C.  
Monday, June 27, 19:30-20:30

Present (alphabetical order):

- R. Bochonko, M. Clement, P. Dewdney, M. Duncan, V. Gaizauskas,
- R. Garrison, J. Halliwell (NSERC), G. Hanna (NSERC), D. Hartwick,
- R.N. Henriksen (chair), V. Hughes, S. Kwok, J. Locke (NRC),
- M. Marlborough, W. McCutcheon, G. Michaud, J. Percy,
- S. Pineault (recorder), C. Pritchett, C. Purton, R. Racine,
- H. Schloessin, D. Vandenberg, A. Woodsworth.

R.N. Henriksen started by giving a status report and reviewed briefly the history of the idea of CITA. The latest developments were the selection of the University of Toronto as host institution, following a detailed consideration of the proposal from three Canadian universities which had offered practical support towards the establishment of the Institute, and an application to NSERC for financial support. On the latter point, R.N. Henriksen read a letter from the President of NSERC (G.M. MacNabb) to P.G. Martin, informing him that the proposal had been discussed by NSERC Council on June 9, 1983 but was formally "tabled" before it came to a vote. It will be considered again at the next council meeting in October 1983. The general tone of the letter indicates optimism about the initiative.

J. Halliwell was asked for comments. She mentioned that CITA is part of a number of new initiatives to be launched which are currently under study and that CITA "is in no way a dead issue for Council". On a question from R. Garrison as to whether CITA was seen by NSERC as a pilot project, J. Halliwell answered that this was certainly an aspect to consider and that the current status of CITA as regards NSERC reflects the uncertainty of a number of members of Council.

R.N. Henriksen informed the meeting that a protocol document has been drafted with the University of Toronto concerning the governing body of CITA. It provides for 5 members to be appointed by the Canadian Astronomical Society (CAS), one by the University of Toronto, the director being ex officio the seventh member. The Institute will be under the jurisdiction of the School of Graduate Studies.

G. Michaud expressed his concern that such a small Institute should be very careful that its administration does not become a burden.

R.N. Henriksen briefly described how the five members nominated by CAS would be chosen. A committee of the CAS, consisting of those members of CAS actively engaged in theoretical astrophysics, would submit to the CAS Council a list of six members from which CAS Council would choose four, the fifth one being chosen as Council saw fit. This fifth member could, although not necessarily, be an observational astronomer or an astrophysicist from abroad. To assure continuity, the membership would be staggered.

the first annual meeting of the Corporation, these individuals, as provisional directors, and pursuant to By-Law No. 5.1, will cease to hold office or, alternatively, will continue to hold office for a period dictated by the balance of the term of office formerly held under the unincorporated Society.

As the Society has become a distinct legal entity, it is necessary that it keep precise financial records and file income tax returns, etc. In this regard, you may continue to prepare your own financial reports and returns, etc., however, in view of the possibility that the Corporation may be dealing with large amounts of money, it may be expedient to have the same handled by a professional accountant. In any event, we enclose correspondence from Revenue Canada which may be of assistance in dealing with this Department in the future and which relates to certain exemptions within which the incorporated Society falls (excuse the bureaucrat's use of the word "astrological" in the letter of September 8, 1982).

We note that the By-Laws allow for a corporate seal for the Society. If you would like us to obtain for you such a seal inscribed with the appropriate wording, could you please advise the writer accordingly. The cost of such a seal is usually on the order of \$30.00.

As this matter appears for the moment to have been concluded, we take the liberty of submitting our statement of account for services rendered to date. The writer would like to mention his appreciation in being allowed to act on the Society's behalf in this matter and to express his willingness to act in this capacity in any future matters.

Yours very truly,

ALLAN & LOUHGEED

Andrew A. Leir

AAL:my  
Encls.

#### OPEN DISCUSSION ON THE CLBA

Approximately 100 people attended this open meeting which occurred close on the heels of the decision by NRC to approve the Canadian Long Baseline Array. The meeting started with two excellent reviews of the impressive astronomical and geophysical capabilities of the array given by Ernie Seaquist and Wayne Cannon.

Wayne provided an interesting insight into the parallel revolutions that took place in astronomy and geophysics following the discovery, in the same year, of quasars and magnetic field reversals in the ocean floor. In both revolutions Canadians played a major role with the development of long baseline interferometry techniques for measuring the angular size of quasars and in the development of the plate tectonic model. In the CLBA we will see a merger of the two fields with the reference frame provided by quasars and the techniques of very long baseline interferometry combining to produce a powerful new technique for studying motions of earth plates and poles.

Ernie Seaquist anticipated that the next step, approval by the Federal Cabinet and Treasury Board, may take up to a year. During this period the planning committee and sub-committees plan to press forward with consideration of improvements in the array and sub systems operating under the principle "Thou shall not increase the capital cost of the array." New developments continue to occur ranging from the development of a global fringe fitting algorithm which promises greater sensitivity, to the discovery of previously untapped expertise in feed design at the University of Manitoba. The possibility of developing a VLSI chip for the correlators is another interesting prospect to be pursued. A request for further financial support for the committee's continuing activities is being submitted to NSERC and NRC.

NSERC is currently funding two CLBA related projects: (a) the development of cooled GaAs F.E.T. amplifiers at the University of Alberta and (b) wider bandwidth recording systems at the University of Toronto.

Both Ernie and Wayne stressed that many countries around the world are developing plans for a very long baseline array for astronomical and geophysical purposes. It was therefore very important that the Canadian project be funded soon to take advantage of some of the best manpower that would migrate to the first major project of this kind. At present many Canadians with relevant experience are working and studying at radio observatories in other countries. They also stressed the importance of future international collaborations that would see the CLBA linked with antennas in other countries and in space.

R.N. Henriksen pointed out that, apart from NSERC contributions, the possibility of obtaining private donations is a real one. He also mentioned that CAS Council had passed a motion expressing satisfaction concerning the apparent general approval from NSERC and reaffirming its commitment towards CITA.

On a question from A. Woodsworth concerning the level of support to be expected from the University of Toronto, R.N. Henriksen elaborated on the status of the first director who would be made a tenured Professor. R.F. Garrison stated that the provost of the University of Toronto had made it clear that the salary paid the Director was not restricted in any way and that it would be whatever would be deemed necessary to attract the right person.

On the matter of budget for CITA, R.N. Henriksen elaborated on the fact that provisions would be made for a substantial amount of funding to be available to theoreticians for travels within the country, either to the Institute site in Toronto or to other Canadian institutions holding events sponsored or supported by CITA.

On a point raised by G. Michaud concerning University Research Fellows (URFs), J. Halliwell pointed out that nothing could prevent a Fellow from selecting the Institute. Furthermore NSERC is currently reviewing its policy towards URFs with regards to renewal of fellowships for another five years. This would likely involve a commitment from the University to take the Fellow in a tenure-stream position upon expiration of the second five-year term.

Asked by G. Michaud as to whether the existence of the Institute could signify a modification to NSERC funding of theoretical astronomy being carried out in institutions other than the Institute, J. Halliwell replied that she did not expect a decrease and that, although one can certainly not say with any certainty, it could on the contrary possibly have a positive effect.

Serge Pineault

The efforts of the planning committee and individual astronomers have generated a lot of interest in the project at the provincial and municipal levels as well as in industry. Ernie showed a glossy proposal from the City and University of Lethbridge for provision of headquarters in their city. Other proposals are expected from Winnipeg, Brandon, Calgary and Montreal. Proposals such as these and lobbying efforts directed at the Federal Government by industry and municipal and provincial governments are very important at this time.

In the question period following the formal presentation many important issues were raised. Rene Racine wanted to know how the U.S. plans were fairing. It appears that the U.S. project is likely to receive some initial funding at the level of \$2.5 million this fall. Paul Feldman wanted to know if the relatively small use of the existing ad hoc VLBI network by Canadians was any reflection of the demand for a dedicated array. Dave Routledge pointed out that the CLBA would be more like the VLA in operation. This instrument is in high demand by Canadians and not only by the radio astronomy community. Many more questions were fielded by members of the planning committee before the meeting was finally drawn to a close by John MacLeod.

P.C. Gregory

June 30, 1983

ASSOCIATE SCIENTIST - STARLAB

Under a collaborative special project grant awarded by NSERO to support the activities of non-government scientists associated with the Starlab project, I received funds which would cover the salary of an "Astronomical Associate" for two years (the second year's support being conditional on the status of the project after one year). The Starlab proposal is extensively discussed in the Phase A document which was circulated earlier this year to all CAS members. There is considerable activity in the project at the moment even although it has not been formally approved in either Canada or Australia. The Phase B studies of the Scientific Instrument Package are under way in Australia and it is expected that similar studies of the telescope and over all facility will begin in Canada in the Spring of 1984. The responsibility of the Project Scientist is to monitor and anticipate the impact of the engineering designs and other constrain on the quality of the science. This is a particularly important activity in the early stages when most of the important decisions are made. In consequence, I am looking for someone to work with me either full or part-time, who has a strong interest and background in observational techniques.

If you are interested please write, or call me.

Gordon Walker  
Starlab Project Scientist  
Geophysics and Astronomy Dept.  
University of British Columbia  
VANCOUVER W6T 1W5  
B.C.

Tel (604) 228-4133  
Tlx 0454245

STARLAB Meeting - June 29, 1983

This is a summary of the STARLAB open discussion held at the CASCA Annual General Meeting in Victoria on June 29. The discussion consisted of a general report by Jim Hesser, with more technical contributions by Dave Crampton, Bill Harris and Harvey Richardson, and with lively and provocative questions and comments from the audience. (A detailed description of the STARLAB project can be found in the STARLAB Phase A report, distributed to all CASCA members. A paper describing the STARLAB project will also appear in J.R.A.S.C. in late 1983 or early 1984.)

Jim Hesser started the discussion with a brief description of STARLAB. STARLAB will occupy three pallets on Space Platform; the fact that STARLAB will not fit on two pallets is expected to be a major cost-driver for the U.S. The telescope will be pressurized during launch to prevent the leakage of contaminants into the telescope. Once in full operation, STARLAB will not be operated in "joystick" (interactive) mode (like IUE); rather, it will be preprogrammed, as is envisaged for Space Telescope.

A "Memorandum of Understanding" (MOU) has now been signed by the three participating countries (Australia/Canada/United States); it should be borne in mind that this MOU does not commit any of the signatories of the agreement to proceed with the project. The MOU provides for 1 or 2 "shakedown" missions on the Shuttle (7-14 days), to be followed by two 6-month missions on Space Platform. A very rough estimate of the cost to Canada is ~50 x 10<sup>6</sup> Canadian dollars (based on earlier U.S. estimates, and corrected for inflation); this figure has been verified by DSMA, but may be in error by as much as a factor of 2. (One of the differences between Space Telescope [ST], which has suffered huge cost overruns, and STARLAB, is that ST has relied heavily on developing new technology. With the exception of the detector package, STARLAB is making use primarily of existing technology.)

In order to conduct a "Mission Profile Analysis", a questionnaire was circulated with the Phase A Report in Canada. Approximately 60 mock observing proposals were received from Canadian astronomers; a report on these proposals is available from Jim Hesser. The proposals show a stronger interest in imagery than in spectroscopy (3:1 in numbers of proposals), as was the case for a similar survey in Australia. About 1/3 of the Canadian imagery proposals require a detector with good sensitivity redwards of 7000 Å - useful for many cosmological problems.

In view of the approval of Phase B funding for STARLAB by the Australian government, it is imperative that Canada now seek Phase B funding (~\$2 x 10<sup>6</sup>/y for 2 years, starting in early 1984) in order to maintain proper synchronization of the project. Phases C and D would proceed in 1986, with spacecraft integration in 1989 and launch in 1991. (Phase B approval does not constitute approval for the project as a whole. It should be noted that CLBA and STARLAB would not in principle be in competition for Phase B funding, since CLBA is being promoted as an astronomy project, whereas STARLAB is being promoted within CCSS as a space science project. In the discussion it was nevertheless noted that



CLBA continues to have the support of CAS as the project with highest priority for Canadian astronomy.)

Overall scientific strategy for the development of STARLAB is in the hands of the Joint Science Working Group (JSWG), whose Canadian members are Greg Fahiman (UBC), John Glaspey (U. de Montréal), Jim Hesser (DAO), and Stefan Mochnicki (U. Toronto). Canadian project scientist is John Glaspey; overall project manager is Gordon Walker (UBC). Various subcommittees (Detector, Direct Imaging and Telescope, Spectrograph, Data and Operations, Calibration) have also been struck, and are extremely active.

Canada has overall responsibility for the STARLAB telescope system, and integration of the telescope and instrument package. It is believed that the optics for STARLAB can be fabricated at DAO, if necessary. One question requiring immediate input from the Canadian astronomical community is whether to use reflective or refractive correctors. (The detector window introduces chromatic aberration for broadband observations; this chromatic aberration can only be corrected with a refractive corrector.) The difficulties of fabricating UV filters without "red-leak" were discussed; this problem will severely compromise UV photometry with ST, and will also present problems for STARLAB. (It should be noted that the "red-leak" of UV filters is really an "adjacent-band" leak; current UV filter technology cannot produce filters with a sharp-enough long-wavelength cutoff.) The design of fine-guidance sensors for the STARLAB telescope has also turned out to be a very difficult and challenging problem (as has proved to be the case for ST!)

The STARLAB spectrograph is somewhat controversial at present. The IUE-like instrument that will cover the entire spectral range of the chosen detectors (nominally 1200 Å - 8000 Å). The spectrograph will offer the unique (for orbiting telescopes) advantages of a "long slit" (8 arcmin in low-resolution mode) and wide spectral range. Initial Australian spectrograph designs suffered from severe vignetting and poor resolution; however, Harvey Richardson (DAO) has come up with an off-axis Schmidt design that has excellent spatial and spectral resolution, wide spectral coverage (UV - 1 µm), and that is well-matched to 130 mm detectors. However, in view of the fact that i) the spectrograph will be an extremely expensive and complex instrument, and ii) most of the scientific interest on STARLAB is centred around imaging, we may well have to reconsider the viability of the STARLAB spectrograph at the end of Phase B studies.

Still on the subject of spectroscopy, Harvey Richardson has also designed a grens that maintains focus over the entire spectral range 1500 Å - 1 µm (250 Å/mm, ~ 5 Å resolution). Lower-resolution grenses are even easier to design; 1000 Å/mm may be optimal, according to Bruce Peterson (AAT) and David Crampton (DAO).

One of the most difficult problems confronting potential STARLAB observers will be instrument calibration. Bill Harris (McMaster)

reported on the current status of calibration procedures, particularly on "flat-fielding" the detector. There is a distinct lack of large angular diameter, photometrically-smooth and sufficiently faint astronomical sources; probably flat-fielding would involve observations of the sky background or internal lamps. However, at a maximum count rate of ~ 1 count s<sup>-1</sup> pixel<sup>-1</sup> (as is expected for the Australian ULFPCA detector), it will take ~ 3 hours to flat-field the detector to 1% accuracy for each filter! (There will be ~ 20 filters.) For absolute calibration, Bill pointed out the need for good faint (18 < V < 22) standard star sequences of 10<sup>2</sup>-10<sup>3</sup> stars in 0.5° fields, with known magnitudes from 1000 Å - 1 µm (UV - near IR). Such sequences clearly do not exist at present! It was pointed out that it would be advantageous to observe flat fields and do absolute calibration both before and after the STARLAB flight.

The detector design for both imagery and spectroscopy appears to be converging towards the Mount Stromlo Observatory ULFPCA (Ultra-Large Format Photon Counting Array). This detector will consist of ~ 10<sup>2</sup> CCD's operated in photon-counting mode (with event-centering logic) behind a large micro-channel plate (MCP) with gain ~ 10<sup>6</sup>. Current plans call for a 130 mm (.5°) field, although the Australians now feel that 90 mm may be more reasonable. In spite of a bewildering array of technical problems still to be solved, ULFPCA's do offer some advantages over other alternatives, such as analog CCD's (good IR response, but mosaicing and cooling problems, plus sensitivity to cosmic rays and magnetic anomalies), or MAMA's (saturation problems on extended sources). It was nevertheless pointed out by René Racine (CFHT) that a survey instrument such as STARLAB requires a detector with wide dynamic range (not possible with photon-counting systems - M31 would clearly "zap" the ULFPCA!) with the low (< 10 electrons) readout noise now being achieved for some CCD's, these devices are very close to being photon-noise-limited at most wavelengths, and possess very wide dynamic range. In addition, CCD's possess excellent near-IR response (important for many cosmological problems).

It was mentioned that there had been little interest expressed so far in using STARLAB for planetary astronomy. It has generally been agreed that the special tracking rates required for solar system studies would not be made available, unless provision of such tracking rates proves not to be a cost-driver for the STARLAB project.

Finally, mention was made of both general and specific research interest in STARLAB among some members of CAP. There was general assent to the idea of having both CAS and the physics community involved in STARLAB after Phase B funding is secured.

Chris Pritchett  
July 2, 1983

## CFHT - THE TIME APPLICATION PROCESS

A major topic of concern for optical astronomers at the June CAS/CAP Congress was the procedure of applying for and assigning time on the CFHT. Opinions were expressed about almost every aspect of the process and, as a result, this matter will be the first concern of the consolidated CFHT-Optical Subcommittee of the Associate Committee on Astronomy, once it is fully formed. As Chairman of this committee I felt it appropriate to draw the matter to your attention immediately, since the deadline for CFHT applications is drawing near.

It is of course too early to report concrete changes or recommendations. However, I can draw your attention to suggestions which might assist those who are preparing applications for CFHT time in the next semester. The most important factor, agreed on by all, is that the telescope itself is heavily oversubscribed - by a factor of 2 or 3 overall, with some months being worse than others. Combining that with the high quality of most applications means that, at some point, difficult and possibly arbitrary choices must be made. Even with the best programs, the best preparation, and the clearest proposal form this is inevitable. As more instruments become available, this situation is expected to become more serious.

In the fall our committee will begin to examine the process of CFHT time allocation with the aim of eventually making recommendations to improve this still evolving process. Anyone who wishes will be able to contribute opinions and suggestions. If you will be an applicant for CFHT time, spend as much effort as you can to make your proposal clear and thorough. This is especially important since the variety of proposals is much wider than the expertise contained in any IPAC.

One final point - the address for proposals. Due to confusion in delivery the address has been revised as follows:

The Canadian Applications Committee  
Care of the Director, Herzberg Institute of Astrophysics  
Canada France Hawaii Telescope  
Room 2003  
National Research Council of Canada  
100 Sussex Drive  
Ottawa, Ontario  
K1A 0R6

It is hoped that the addition of line 2 will avert loss or delay of proposals.

Gretchen L.H.Harris

## A CAS Small Grants Programme?

Chris Pritchett

At its past two meetings, CAS Council (now "Board of Directors") made note of the currently-healthy financial state of the Society. Of course, the day-to-day operation of CAS continues to be effectively subsidized by the institutions at which CAS Directors are employed; however, there is no sign that this subsidization will cease in the near future. With the above in mind, it was felt that it may be possible to set up a grant programme (perhaps similar to the Small Grants Programme administered by the AAS), with the understanding that the funds available for such a programme (and the future of the programme) would be under year-to-year review. General assent was expressed for this idea at the CAS Annual Business Meeting held in Victoria.

It would seem that a Small Grants Programme would serve a useful purpose in Canadian astronomy. There are a number of young post-doctoral-level astronomers in Canada who are not eligible to apply for NSERC Operating Grants. In many cases, other sources of funding for research activities (travel to conferences, observing trips, page charges, etc.) are severely limited or non-existent. A Small Grants Programme administered by CAS could play an important role in supporting high-quality astronomical research in Canada.

Before setting up such a programme, the CAS requires answers to a number of general questions. Most importantly, are we sure that there is a well-established need for such a programme in Canada? What constituency of the CAS would the programme serve? How would grantees be selected? How would a grant be administered?

In order to help us assess the viability of a Small Grants Programme, we would appreciate your response to the questionnaire that follows, whether or not you plan to make use of the programme. Please mail your responses to:

Chris Pritchett  
Physics Department  
University of Victoria  
P.O. Box 1700  
Victoria, B.C.  
V8W 2Y2

It is important that your response reach me by OCTOBER 31, 1983, so that we may consider this matter at the next Council meeting.

IS AN ALL-CANADIAN LONG-BASELINE ARRAY STILL A DESIRABLE GOAL  
FOR CANADIAN ASTRONOMY?

In the light of plans for a U.S. long-baseline array, is it still in the best interests of Canadian astronomy to pursue the goal of a Canadian long-baseline array (CLBA)? We, the undersigned, all staff members or associates of the Dominion Radio Astrophysical Observatory, feel this to be the case. Our reasons are outlined in the following sections.

**Scientific Justification.** The question of whether two large arrays are scientifically justifiable must be considered. The uniqueness of the CLBA can no longer be used as an argument in its favour, but it was perhaps naive to have ever considered that, if the CLBA were built, it would long remain as the only dedicated long-baseline array in the world. Large research instruments, in all fields of science, generally have similar counterparts elsewhere in the world. This is a requisite of the scientific method - confirmation of crucial results is always required. Consider, for instance, the great amounts of money and effort being expended in several countries to construct similar facilities to investigate the possible decay of the proton. In the study of active galactic cores by means of long-baseline interferometry, where the final images depend so critically on the data processing techniques, complementary observations are especially desirable.

However, aside from this aspect of a large research instrument, there must be an opportunity for obtaining new results. Since a large array can only map a tiny patch of sky at one time, there is ample sky to keep two or more large arrays active in forefront research for many years. Furthermore, the time variability of galactic nuclear activity, and of galactic and extragalactic spectral lines from maser sources, will be fruitful fields of investigation for the lifetime of the array. One must also keep in mind that the two arrays are somewhat different. The east-west configuration of the CLBA, in contrast to the two-dimensional nature of the U.S. design, results in different imaging properties of the two instruments. The Canadian array will have a larger effective field of view and will be sensitive to a greater range of spatial structures. Also, the total collecting area of the proposed CLBA, exceeds that of the proposed U.S. array by 30%, giving the CLBA greater overall sensitivity. The individual interferometers in the Canadian array will be 60% more sensitive, which may have a profound effect on calibration.

Moreover, the Canadian array, from its original conception, has been designed for geophysical as well as astronomical applications. Such research is not planned to be a major function of the U.S. array. The CLBA, with some elements anchored on the Canadian Shield, will be ideally suited to studying geodynamics and motions of the earth's crust.

NAME and ADDRESS (optional):

1. How should the eligibility of grantees be defined? (e.g. CAS members only? Ph.D. required? Grad students? Residency/nationality requirements? Only astronomers who are not eligible for other sources of Funding?...)
  1. Do you feel that you should be eligible for a grant? (Why or why not?) For what purposes would you use a grant? What amount of money would constitute a "reasonable" grant for your purposes?
  2. An administrative body would have to be formed to review grant applications. How should this body be constituted? (Who would choose its members? Any special requirements such as geographical distribution, members from various disciplines? Term of office?) How often should it meet?
  3. What criteria should be applied in assessing grant applications? (e.g. scientific merit, financial need, age, sex, location...)
  4. Any ideas on how the grant should be administered and monitored?
  5. What kinds of expenditures by grantees should be allowed or disallowed? (Salaries, travel, equipment, page charges, books, computing costs....)
  6. Any other comments? Would you rather see CAS Funds used in a different way?

Please mail responses to Chris Pritchett (Physics Department, University of Victoria) by October 31, 1983.

The very fact that a high priority has been given to a long-baseline array in the U.S. underlines the great scientific need for instruments such as the CLBA.

**Technical Considerations.** Although the Canadian and U.S. proposals are projects of similar magnitude, the CLBA is simpler in several respects. Fewer antennas and observing frequencies should result in a shorter construction period. Since a fair proportion of the preliminary design for the CLBA is complete, it is possible that a Canadian array could be in operation before its U.S. counterpart. This would be of benefit to Canadian high-technology industries and, of course, to the image of Canadian science.

All of the arguments presented in the original CLBA proposal with regard to the impact of the project on Canadian industry are still valid, and perhaps are somewhat enhanced by the existence of a similar project in a neighbouring trading partner.

**National Goals.** When the CLBA project was conceived, it was enthusiastically supported because it promised

- (a) to restore Canadian research in radio-astronomy to a forefront position in a field where some of the most fundamental problems await solution and
- (b) to provide a new focus to the mainstream of radio astronomical research in Canada, giving a first-rank facility for graduates of radio-astronomy programs in Canadian universities, and thus stimulating these programs.

These goals can still be provided by the CLBA, regardless of the existence of long-baseline facilities elsewhere. The effect of the project on Canadian engineering schools and high-technology industries cannot be underestimated. The array will be a valuable national resource not only for its contributions to scientific knowledge but also for the experience in high-technology problem solving that it will provide for those involved in its construction and operation. These goals, admittedly nationalistic, are worth striving for, and would not be achieved by a collaborative venture with the U.S.

**Manpower Considerations.** Some may feel that the construction of two large arrays on the North American continent will have an adverse effect on the manpower resources that the CLBA will be able to attract during the construction phase. Since the CLBA is expected to be largely contracted to industry, one is principally looking for a pool of technical and scientific supervisors. Even though the CLBA project may well require the full-time efforts of a sizeable number of the currently active researchers in federal and university radio-astronomy groups, we feel that skilled manpower resources exist. Moreover, it

must be recognized that the CLBA, during the construction phase of several years, will attract an increasing number of technical and scientific graduates of Canadian universities. One can compare the construction of the CLBA with that of the 100-metre telescope in Germany. At the time of its conception, German radio-astronomers were few and largely out of the country. During the construction phase, there was concurrent growth of radio-astronomy and related technical fields in German universities, eventually resulting in a world centre of radio-astronomy research. A similar situation can be foreseen for the CLBA, assuming that it is adequately supported with staff positions and funding.

Because the CLBA is well justified on scientific grounds, there will be more than enough potential users. The growth which the CLBA will stimulate in Canadian universities will provide many additions to the large body of researchers already active in long-baseline studies (especially in Europe) to ensure the utilization of both North American arrays. Moreover, a dedicated array such as the CLBA will be operated so that users will not have to be experts in interferometry techniques, and it will attract a wide spectrum of scientists.

**Conclusion.** We feel that if the two proposed long-baseline arrays had been planned for countries on separate continents, there would be no question of justification for a CLBA. It is principally because Canada and the U.S. are geographic and economic neighbours that the question arises. However, the proximity of the two facilities is an additional argument in favour of the construction of both. It is certain that some degree of compatibility will be incorporated in the two designs so that some joint observing will be possible. With future developments in technology, integration into one super-array might eventually be possible, and scientifically desirable for some projects. We wholeheartedly support continuing efforts to obtain approval for what will be Canada's prime radio-astronomy facility of the 1990's.

L.A. HIGGS  
J.L. CASWELL  
C.H. COSTAIN  
P.E. DEMDNEY  
J.A. GALT  
J.D. LACEY  
T.L. LANDECKER  
C.R. PURTON  
R.S. ROGER  
D.G. STEER  
B.G. VEIDT

Penticton, B.C.  
May 5, 1983

## THE MK PROCESS WORKSHOP

By BOB GARRISON

The workshop on MK Spectral Classification held in Toronto from 6 to 9 June was a very special event which was enjoyed by all who were able to attend. Since many CAS members were not able to be there, I'd like to communicate the main points of the meeting in a few paragraphs. The MK System has influenced most areas of astronomy in one way or another, directly or indirectly. No other system is as well developed or as useful over a wide range of types of stars. Morgan and Keenan, who originated and perfected the MK system, have used it cannily since 1943 to advance our knowledge of the universe around us.

Morgan, who is as lively as ever at 77, was the first to outline the modern picture of the spiral structure of the Milky Way Galaxy. He also originated the UBV system, which was perfected by Johnson. He peculiar and metallic line A stars were discovered by Morgan. He devised a galaxy classification scheme which helped to provide new insights into the structure of the galaxies. The D and N galaxies were defined by Morgan and their significance in radio astronomy was outlined in the classical papers with Matthews and Schmidt. The list of influences goes on and on.

Keenan, who at 75 is still the world's leading stellar spectroscopist, has greatly advanced our knowledge and understanding of cool stars. Anyone who has worked on carbon stars, Miras, yellow giants or other difficult objects cannot help but respect his pioneering work in many fields of stellar spectroscopy. The workshop was organized to honour the work of these two extraordinary people.

Morgan and Mihalas carefully distinguished between the "MK System" and the "MK Process". The former is carefully defined for a certain resolution and wavelength region, whereas the "MK Process" can be used to extend classification work to other wavelength ranges and resolutions as well as to other populations of stars. Indeed, the MK Process is so powerful and so useful that the principles can be used to classify virtually any set of objects. The clear distinction between the philosophical MK Process and the narrowly defined MK System is probably the most important result of the meeting, in the long run.

Keenan, ever the pragmatist, discussed "What is wrong with the MK System", in which he outlined some of the errors which he felt he has made over the years. That discussion provided some good insights into both the Process and the System.

There were many other highlights to the meeting, but I only want to mention a few. David Gray gave an excellent talk on the new generation of electronic detectors and how they can be used in MK classification. Very few of them are suitable for absorption line work and even fewer have much blue response. One of the most interesting points brought out by Gray was then beautifully illustrated by Chris Millward of UBC (working with Gordon Walker). That is that the formal calculation of signal to noise ratio does not tell the whole story. In order to make a tracing as easily classifiable as a well-widened photographic spectrum, it is necessary to go to an S/N of about 500-1000 at a resolution of 1-3 Å. No wonder tracings have not been

appealing up to now! After seeing Chris Millward's spectra, I would have no hesitation classifying from tracings.

Michael Kurtz, fresh from his Ph.D. and now working at the Center for Astrophysics (Harvard), gave a good review of the field of automatic classification, and a very encouraging look into the future. He is the first to look at automating the MK Process in a way that preserves its great advantages. His talk should be required reading for anyone interested in computer applications to any classification or image processing problem.

David Crawford gave an excellent summary of how the MK System complements photometric systems, and vice versa. All too often in the past there has been an air of competition rather than interdependence, and yet complementarity uses the best of all systems. I first suggested the idea of complementarity in 1978 at the Vatican Colloquium on Spectral Classification and I still think it is the only way to go.

Roberta Humphreys, who has pioneered in the classification of individual stars in external galaxies gave a plea for careful work on faint standards, since many of the new detectors cannot look at stars brighter than 12th magnitude. The DDO-CFHT prime focus spectrograph, which will reach 16th blue magnitude photographically, is the ideal instrument for the task and she was quite excited by the potential of work being done in Canada.

At the banquet, Morgan was presented with the RAS medal by Patrick Mayman, who flew over from Ireland especially to deliver the medal which had been given earlier in London in absentia. It was a very moving ceremony, and a fitting celebration of Morgan's important contributions.

All in all, it was an important event in Canadian astronomy and we can all be proud to have been able to support such a workshop. The Proceedings will be published at the end of the year and will be of interest to a wide audience, not just to specialists in the field. Reading it will be second best to being there, but a good alternative.

THE CFH TELESCOPE IN THE 1990'S:  
TRENDS OF TODAY AND GLIMPSES OF TOMORROW.

René Racine  
Canada-France-Hawaii Telescope Corporation

ABSTRACT

Current trends and some extrapolations are used to forecast that, by the 1990's, the CFH telescope will have become essentially a cassegrain instrument, and that the prime focus configuration will have been retired. The survival and growth of infrared astronomy and of coudé spectroscopy at the CFHT require a single upper end which could feed both IR instruments and coudé spectrographs.

1. Introduction

The Canada-France-Hawaii telescope (CFHT) was designed and built as a multi-purpose instrument providing four foci through the use of three exchangeable upper ends: the prime focus cage (also housing the coudé secondary mirrors), the infrared upper end, giving an F/35 cassegrain focus from an oscillating, sub-diameter secondary, and the F/8 cassegrain upper end. This versatility makes the operation and maintenance of the telescope somewhat complex but offers two major advantages. The first is obviously to accommodate, in an optimized fashion, almost any conceivable research program in astronomy, from the atmospheric UV cut-off, through the visible and near IR to the submillimeter range. The second advantage is the adaptability conveyed to the telescope by its modifiable configuration. As the style of research and the technology of the instrumentation evolve, the CFHT can be readily modified or expanded to adapt to the new situation and to respond to the changing needs.

It is strictly impossible to forecast a steady-state configuration for most telescopes, and even more so for one with built-in adaptability. However, it is possible to predict with some confidence what will be the most used configurations in the moderately long term, and to plan accordingly.

This short paper is little more than an in-house document, generated for the internal use of the CFHT Corporation, precisely to help foresee the future evolution of our installations. Because some of the information and ideas it contains could be of interest to the users of the CFH telescope, and because feedback from these users does play an important role in the evolution of the telescope, it appeared that publishing this paper in these pages could be of some use.

2. The Trends

Figure 1 shows the trends in CFHT scheduling since the commissioning of the telescope in early 1980, in terms of foci used. The curves are smoothed representations of the (noisy) data given in Table 1. Statistics have now accumulated to the point where some meaningful forecasts can be made, with the help of some insight of the instrumentation commissioning program and of some educated guesses on the future evolution of detectors.

Although not overly surprising, these trends are illuminating. They can be used to guide priorities in telescope maintenance and upgrading; they suggest some additions and modifications to our facilities, and they offer a glimpse in the future operation of the telescope.

During 1980 and 1981, the prime and coudé foci were the only ones available. Their relative use declined in recent years - by nearly a factor of two for the prime focus - as the infrared and, mostly, the F/8 cassegrain foci came on line. Engineering time, vastly dominant in 1980, has dropped dramatically and is now slowly approaching an asymptotic value of some 10 percent.

Contrary to what one might have expected at first for a telescope at one of the best infrared sites in the world, time requested and allocated for IR astronomy will apparently not become a major component of the schedule. On the other hand, soon after its commissioning, the F/8 cassegrain became a dominant factor and its popularity is still rising.

3. Discussion

It appears from Table 1 and Fig. 1 that the use of the prime focus and, to a lesser extent, of the coudé are yielding to the pressure from the F/8 cassegrain. It is still difficult to predict what level of use the F/8 focus will eventually reach. But when one takes into account the large diversity of instruments designed for that focus, most of which are still to be commissioned, the

advantages the F/8 has to offer over the prime focus for such "typically prime focus" observing as faint limiting magnitude and high resolution with the superb seeing at the CFHT, one can expect that at least half of the work still being done at the prime focus will soon be transferred to F/8. In the longer term, with the advent of larger format two-dimensional electronic detectors, it is even likely that work at the prime focus will be discontinued altogether.

The relatively low allocation of time to the IR focus may still be due to the teething pains of this system and of its instrumentation. But, during bright of the moon time, the IR will always have to compete with the strong coudé projects, for which the CFHT is especially well equipped, as well as with some F/8 work and with 5 to 10 percent of engineering. It is plain that in order to increase the IR work above the 10 percent level, daytime observing will be required and some convenient and quick way of alternating between daytime IR and nighttime coudé will have to be devised.

High resolution spectroscopy, now done at the coudé focus, is unlikely to be able to shift significantly to F/8, even if a suitable cassegrain spectrograph was available because of the pressure on dark time work and because our coudé spectrograph is already a proven success. However, it is clear that spectroscopy of 12 to 17 magnitude objects at F/8, during gray time, will be much in demand, thereby increasing F/8 time and decreasing correspondingly coudé or IR observing.

From the trends shown in Fig. 1, and from the above considerations, one can make a reasonably realistic forecast of the lifestyle at the CFHT will be in the late 1980's and in the 1990's. Such forecasts are given in Table 2.

One will note that the relative use of the four foci, eventually dominated by the F/8 cassegrain, is not well suited to the current combination of upper ends, when due attention is paid to dark and bright time scheduling. What Fig. 1 shows is that in 1980-1981 the mechanical conception of the CFH telescope dictated which foci had to be used, while the 1982-1983 data, and the present forecast say that the present and future scientific needs are different from those first served by the telescope.

For instance, dark times are essentially prime or F/8 times, which are an upper end exchange apart, while prime and coudé (same upper end) are necessarily 14 days apart. Also, IR and coudé work can naturally be combined during the same bright moon but do require upper end exchanges. This should not be construed as a criticism of the telescope design, but rather as the unavoidable consequence of the complexity of an all-purpose telescope.

Because the F/8 upper end will be used practically every month and is not suitable for bright time work, at least two and often three upper exchanges will occur every month. It must then be a top priority that these exchanges be feasible with absolute reliability.

The most sorely lacking combination will be one which would allow nighttime coudé work together with daytime coudé spectroscopy. Such a system would likely be used some 25 percent of the time, i.e. during most bright runs. Means of feeding instruments from upper ends other than their normal ones must also be investigated. For instance a fibre optics coudé feed from the F/8 or IR focus would be a very advantageous arrangement. It is likely that the continued productivity of the CFH telescope in coudé spectroscopy and for infrared astronomy hinges heavily on such means being available.

#### 4. Summary

The CFH telescope will become essentially a cassegrain instrument. Other optical configurations will soon be reduced to 10 percent level perturbations in the observing schedule. Priority should thus be given to the optimisation of the F/8 configuration. Because the F/8 instrumentation is not well suited to bright time or daytime observing, frequent upper end exchanges will be required with the presently available options.

The growth of IR astronomy at the CFHT can only be ensured through daytime observing and by the concurrent possibility of twice-a-day exchanges between the IR and coudé foci. In the 1990's an optimized CFH telescope would use only two upper ends: the F/8 unit - with fibre optics feed to the coudé spectrograph? - and an IR/coudé unit whose design should be started soon. The prime focus unit and its correctors will, by then, be obsolete.

TABLE 1

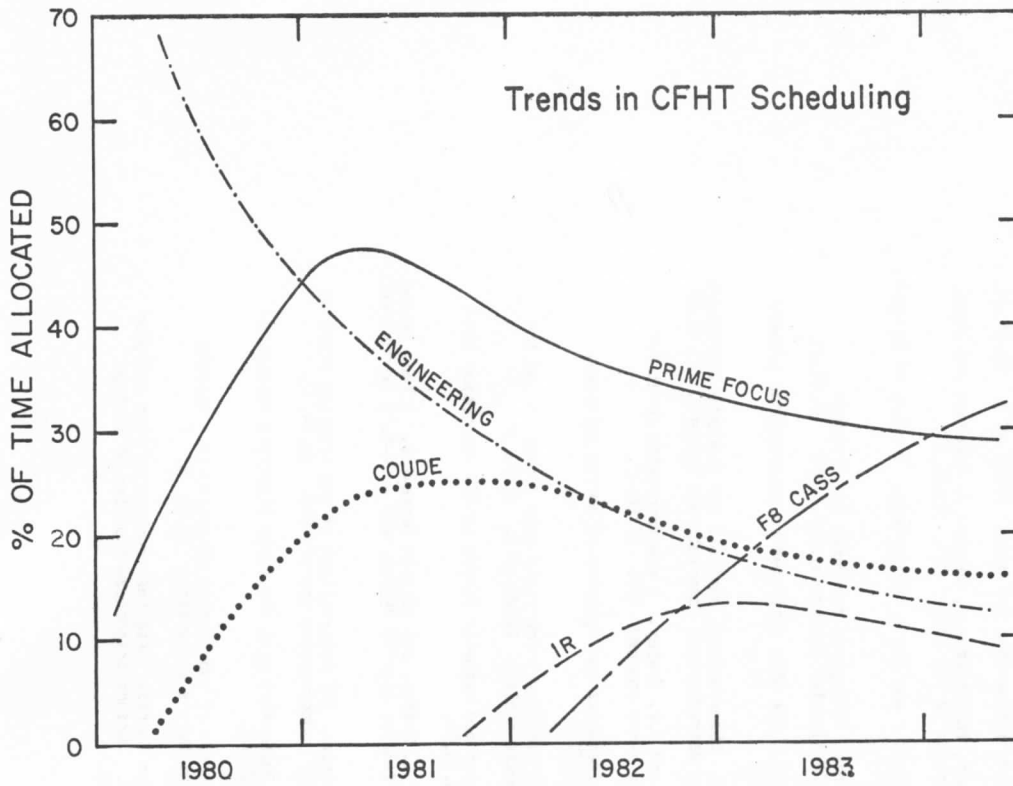
Historical Allocation of CFHT Time, by Foci.

Semester	percent of time allocated for				
	Prime	Coudé	I.R.	F/8	Engin.
1980 I	24	0	0	0	76
1980 II	33	15	0	0	52
1981 I	55	24	0	0	21
1981 II	35	25	3	0	37
1982 I	42	26	5	3	24
1982 II	30	20	16	12	22
1983 I	34	11	13	26	16
1983 II	28	24	9	22	17

TABLE 2

Predicted Future Allocation of CFHT Time

Foci	Percent of time allocated in	
	1985	1995
F/8 cass.	55	70
Prime	15	0
Coudé	10	20
Infrared	10 + 10 (day)	5 + 25 (day)
(Engineering	10	5
	100 + 10 (day)	100 + 25 (day)





## CANADIAN ASTRONOMY PREPRINTS

MARCH 17, 1983 to JUNE 29, 1983

The following file contains a list of preprints written by Canadian astronomers. All preprints were received at the David Dunlap Observatory within the dates as stated above.

The file is arranged in alphabetical order according to the surname of the first listed author of each preprint. Originating institution and date of receipt at the David Dunlap Observatory Library are listed.

If you have distributed a preprint and would like it to be included in this list, please send it to:

\*(Please note new address)

Astronomy Library  
University of Toronto  
Room 1306  
60 St. George Street  
Toronto, Ontario  
M5S 1A7

XX

## PREPRINTS:

- Arellano Ferro, A. Period and amplitude variations of Polaris. DDO/U of T. 83.03.23.
- Bignell, R.C. and J.P. Vallerie. Linear polarization observations in selected celestial zones: The Gum nebula area. IIRAO/HIA. 83.04.16.
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