
CASSIOPEIA



No. 80 - Autumnal Equinox 1993
ISSN 0715-4747

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EDITORIAL

As yet another new editor of **CASSIOPEIA** I would like to extend greetings to all members. I trust that I am up to the task of filling the considerable shoes of my predecessors. I hope to continue in the same vein as the previous editor but with one big difference in the way the newsletter itself is put together.

After much experimenting and soul searching I have decided to drop the use of T_EX and use WordPerfect instead. This will make things easier for the secretaries in the Department of Mathematics, Physics and Engineering at Mount Royal College, who with the permission of my Department Chairperson, will be acting as assistants. The T_EX capability will, however, not be lost. Brian Beattie has kindly allowed me to retrieve all the T_EX templates and macros he had set up over the years for producing **CASSIOPEIA** and I will keep these in a safe place alongside the Society's Great Seal and the full page picture of Her Ladyship, **CASSIOPEIA**, which were passed down to me by the previous incumbents.

These changes in preparation format will be transparent to contributors. Contributions can be sent to me via e-mail (see address below) either as an ASCII text file or as a T_EX file. I will strip off the T_EX control characters after transferring the file to our Departmental PC and do the necessary editing into columns or whatever format seems suitable. Articles in French are also very welcome of course. Again, I would prefer these as ASCII files and, given my knowledge of French, it would be a good idea to send a hard copy as well, with all accents clearly marked. Articles may also be sent on 5.25" or 3.5" floppy disks in either IBM or Macintosh format as I do have a means of transferring the latter. Disks will be returned if requested. The mailing address for all hard copy material is in the usual place on the back cover.

I am, of course, always open to suggestions and constructive criticism for improving and/or expanding the newsletter. I can be reached via e-mail (the preferred means) at jpenfold@mtroyal.ab.ca. It goes without saying that destructive criticism should be e-mailed (Can it be used as a verb, Jeremy?) to blackhole@accdisk.blr.ngc5548. I look forward to hearing your suggestions and receiving a flood of contributions. After all, many areas have been flooded during the past summer. Why not **CASSIOPEIA** as well?

I hope that the association between myself and **CASSIOPEIA** on the one hand and **CASCA** on the other will be long and fruitful. On behalf of the Society let me pass on thanks to both Don and Brian for their time and effort, and for a job well done!

Finally, let me assure members that in spite of the common heritage of myself and the previous editor I have no plans to change the name of the newsletter to **CENTUARUS**. Now that I think about it though, the name does have a certain resonance to it. Hmm.....

NSERC ALLOCATION EXERCISE

NSERC is in the process of adjusting the allocation of funds between its 30 or so Grant Selection Committees. The purpose of this exercise is to "provide more flexibility to fund disciplines according to changing needs". This adjustment will first affect the budgets of the Grant Selection Committees in the 1995-96 fiscal year, i.e. the grants that are applied for one year from now, in fall 1994. The reallocation is a zero-sum game: 5-10% of each GSC's budget will be held back to be placed in a common pool. The funds in the pool will then be distributed back to the GSCs on the basis of four criteria: overall quality of research, relative cost of research, training of highly qualified personnel, and discipline dynamics (rate of growth, emerging areas, and national interest). This exercise is to be repeated every three years.

Each GSC is required to submit an Allocation Report that describes the quality of the research in its community and comments on the other criteria listed above. The Space and Astronomy GSC has prepared a preliminary version of this report which was sent to NSERC last month; we will receive feedback from NSERC and prepare a final version for submission by September 1 1994.

Obviously it is in our interest to make a strong case that we deserve funding. The purpose of this note is to solicit comments from CASCA members on the preliminary Allocation Report. We would like to hear about factual errors and typos but are especially interested in

(1) novel arguments that we can use to illustrate the quality of our research by international standards; (2) reasons why the cost of doing research is increasing; (3) emerging areas of research that deserve significant new funding; (4) evidence that our discipline is growing, in Canada or abroad; (5) illustrations that there is demand for highly qualified personnel.

The preliminary Allocation Report was written by Bill Harris and me and has been reviewed by the other GSC members. There is a strict page limit that we have already reached; thus new arguments will have to be better than the present ones to be included. The report is available in three ways (in decreasing order of preference):

(i) TeX and postscript files are available by anonymous ftp. Just ftp to *ftp.cita.utoronto.ca*, login as "anonymous", give your e-mail address as password, change directory to *cita/scott*, and get the file *dis.tex* (plain TeX) or *dis.ps* (postscript).

(ii) e-mail to *tremaine@cita.utoronto.ca* and I will send you the TeX file.

(iii) If neither of these methods works, I can send you a paper copy by snail mail.

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Canada
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FAX: (416)978-3921
E-mail: tremaine@cita.utoronto.ca

Subscribing to the CFHT Newsletter:

From time to time CFHT sends out an electronic newsletter detailing changes to CFHT instruments, detectors, or policies regarding observers. The latest edition was sent out on July 1, 1993, with an article on CCDs at CFHT. If you would like to be included on the email distribution list, please send your request including your complete

e-mail address to: glaspey@cfht.hawaii.edu (Internet).

The latest news on CFHT CCDs is also available via anonymous ftp to [ftp.cfht.hawaii.edu](ftp://ftp.cfht.hawaii.edu/pub/ccdnews/) in *pub/ccdnews/*

John Glaspey, CFHT

Le service des nouvelles du télescope Canada-France-Hawaii

Le quartier général de la Société du télescope Canada-France-Hawaii annonce épisodiquement, par télématique*, les changements récents à ses instruments et détecteurs ou aux règlements relatifs aux observateurs. La dernière édition, qui date du premier juillet 1993, portait sur les détecteurs CCD au TCFH. Vous pouvez souscrire à ce service en nous faisant parvenir votre nom et l'adresse de votre compte d'ordinateur à glaspey@cfth.hawaii.edu (internet).

Si vous avez accès à un service FTP, vous pouvez obtenir une copie des dernières nouvelles en entrant en session sur << ftp.cfth.hawaii.edu >> comme usager << anonymous >>. John Glaspey, TCFH

* En anglais, E-mail connection

LE PRIX BEALS/THE BEALS AWARD

The Carlyle S. Beals Award was established by CASCA in 1981 in recognition of the groundbreaking researches of the late C.S. Beals. The Beals Award of \$1000 is to be awarded to a Canadian astronomer or an astronomer working in Canada, as an award for outstanding achievement in research (either as a specific achievement or as a lifetime of research). The recipient shall be invited to address the Society at its Annual Meeting, the expenses for which shall be covered by the Society.

An award is now considered every second year, in even-numbered years. Candidates for the award may be nominated by at least two members of CASCA, who shall submit a letter or letters of recommendation and curriculum vitae on behalf of the candidate to the Awards Committee*. The deadline for submissions for the 1994 award is 1 November 1993.

Le Prix Carlyle S. Beals a été institué par la CASCA en 1981 en reconnaissance des travaux de pionnier du regretté C. S. Beals. Le Prix Beals de \$1000, doit être accordé à un(e) astronome canadien(ne) ou à un(e) astronome travaillant au Canada, comme prix soulignant une contribution exceptionnelle à la recherche (contribution spécifique ou contribution s'étendant sur toute une carrière). Le (ou la) récipiendaire sera invité(e) à adresser la Société à son assemblée annuelle, et les dépenses relatives à cet événement seront couvertes par la Société.

L'octroi du prix est maintenant envisagé à tous les deux ans, à chaque année paire. Les candidat(es) pour le prix doivent être mis(es) en nomination au moins deux membres de la CASCA, qui devront soumettre au Comité* une ou des lettres de recommandation et un curriculum vitae au nom du (de la) candidat(e). La date limite de soumission pour le prix de 1994 est le premier novembre 1993.

* Prof W.H. Wehlau, Chairperson
CASCA Awards Committee
Astronomy Department
University of Western Ontario
London, Ontario, N6A 3K7

THE PLASKETT MEDAL/LA MEDAILLE PLASKETT

The Royal Astronomical Society of Canada and the Canadian Astronomical Society have established an award entitled The Plaskett Medal in recognition of the pivotal role played by John Stanley Plaskett in the establishment of astrophysical research in Canada. The award, consisting of a gold medal, is to be made annually to the graduate from a Canadian university who is judged to have submitted the most outstanding Doctoral Thesis in astronomy or astrophysics in the preceding two calendar years.

At most two candidates should be nominated by the head of his/her astronomy/physics department from among the graduates of that university. The department head should submit four copies of a letter of recommendation, not more than three pages in length, and four copies of the nominee's thesis to the Awards Committee*, prior to 15 January 1994, for consideration for the 1994 award. If the thesis does not clearly indicate how much of its content is the original work and ideas of the author, the department head should address this point in the letter. No other material should be submitted. Note that the phrase "in the two preceding calendar years" in the eligibility rules makes it possible to re-nominate a candidate for whom an unsuccessful nomination was made in the preceding year. Because none of the documentation of previous nominations is retained for the use of the current selection committee, all re-nominations should be submitted with full documentation.

La Société Royale d'Astronomie du Canada et la Société Canadienne d'Astronomie ont institué un prix, nommé La Médaille Plaskett, en reconnaissance du rôle important qu'a joué John Stanley Plaskett dans l'implantation de la recherche en astrophysique au Canada. Le prix, qui consiste en une médaille d'or, est offert chaque année à un(e) diplômé(e) d'une université canadienne qui, d'après l'opinion du jury, a soumis la meilleure thèse de doctorat en astrophysique des deux dernières années.

Au plus, deux candidat(e)s par département peuvent être proposé(e)s par le directeur du département. Le directeur doit transmettre quatre copies d'une lettre de recommandation, de trois pages au plus, et quatre copies de la thèse du (de la) candidat(e) choisi(e) au comité des prix* et ce, avant le 15 janvier 1994 pour que le (ou la) candidat(e) soit considéré pour le prix de 1994. Si la thèse n'indique pas clairement la contribution de l'auteur quant au travail et aux idées, le directeur doit adresser ce point dans sa lettre. On ne doit pas transmettre d'autre document.

S.V.P., veuillez noter que l'expression "les deux dernières années" spécifiée par les règlements d'éligibilité, permet de proposer pour une deuxième fois un(e) candidat(e) qui n'a pas été retenu(e) l'année précédente. Cependant il faut soumettre de nouveau les documents nécessaires à l'évaluation car les membres du jury changent d'une année à l'autre.

oooOoooo

SEDS-CANADA

SEDS-CANADA (Students for the Exploration & Development of Space) continues to expand in Canada. The Canadian Branch, which is based at York University, was formed in 1992. The Mt. Royal College chapter, formed in 1993, plans to expand and become the Calgary chapter by including students at the University of Calgary as well.

SEDS-CANADA, York University, Rm. 333, Student Centre, 4700 Keele St, North York, ON, M3J 1P3.

**CANADIAN INSTITUTE FOR THEORETICAL ASTROPHYSICS/
INSTITUT CANADIEN D'ASTROPHYSIQUE THEORIQUE**

POSTDOCTORAL FELLOWSHIPS

CITA is a national centre for theoretical astrophysics located at the University of Toronto. The Institute expects to offer several postdoctoral fellowships with a starting date of 1 September 1994. The appointments will be of two years duration. Funds will be available for travel and other research expenses. Fellows are expected to carry out original research in theoretical astrophysics under the general supervision of the permanent faculty or visitors to CITA, whose interest include: cosmology, interstellar matter, nuclear and relativistic astrophysics, solar physics, star and planet formation, stellar structure, and galactic and solar system dynamics.

RESEARCH ASSOCIATE POSITIONS

CITA is a national centre for theoretical astrophysics located at the University of Toronto. The Institute may offer one or more research associate positions with a starting date of 1 September 1994; applicants should have an excellent research record in astrophysics and postdoctoral experience. The appointments will be of three years duration, renewable for an additional two years. Funds will be available for travel and other research expenses. The primary duty is to carry out original research in theoretical astrophysics, but research associates are also expected to work with postdoctoral fellows and to assist with administration of the Institute.

All applicants for research associate positions are also considered automatically for postdoctoral fellowships.

In accordance with Canadian immigration regulations, this advertisement is directed to Canadian Citizens and permanent residents.

In each instance applicants should send:

- a curriculum vitae
- statement of research interests
- and arrange for three letters of recommendation to be sent to the Director of CITA

All applications and letters should be sent to:

Professor S. Tremaine, Director
Canadian Institute for Theoretical Astrophysics
University of Toronto, 60 St. George Street
Toronto, Ontario, CANADA, M5S 1A7

**DEADLINE FOR APPLICATIONS AND ALL LETTERS OF
RECOMMENDATION IS 15 DECEMBER, 1993**

CITA encourages applications by qualified women and men.

From: "Austin F. Gulliver" <GULLIVER@BrandonU.CA>
Subject: Former Soviet Union Astronomers
To: CASCA_MEMBERS: ;

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An Appeal to the CASCA Membership

In the spring of 1992, the newly formed Soviet Astronomical Society approached the President of CASCA concerning the possibility of Canadian assistance in the support of astronomy in the deteriorated economic structure of the former Soviet Union (FSU). CASCA's charitable trust, Cascatrust, was then in its formative stages and action along these lines was deferred until the trust was firmly established. In the meantime, the situation in the FSU has not improved greatly: astronomical research is generally poorly supported, many astronomers exist on the equivalent of \$300 or less per year, and the shortage of foreign currency severely inhibits communications. At the June 1993 Annual Meeting of CASCA the membership in attendance endorsed the plan of CASCA Council to launch a modest short-term program of support of astronomy in the former Soviet Union.

In the last year and a half, the American Astronomical Society conducted a major campaign of support through small research grants awarded upon the recommendation of an advisory committee of eminent astronomers in the FSU and a corresponding AAS committee. This very successful program has already provided support to 400 or more researchers. Organizers of the program have pointed out to us, however, that there are still "niche" areas where support is still desperately needed: these include the provision of communication and computing equipment, travel support outside the FSU and more journal subscriptions. With these facts in mind, we are proposing to the Soviet Astronomical Society that CASCA will support, for two years, a program of small travel grants (not to exceed \$500 US each) to assist (non-conference) travel of young FSU astronomers (40 years old and younger) to domestic or foreign facilities/institutes for short-term research purposes, to be administered through that Society. If they

Un appel aux membres de la CASCA

Au printemps de l'année 1992, la société soviétique d'astronomie, formée depuis peu, contacta le président de la CASCA au sujet de la possibilité d'obtenir de l'aide pour l'astronomie subsistant dans la structure économique détériorée de l'ex-Union Soviétique. Le fond charitable de la CASCA, Cascatrust, en était alors à ses premiers stades et, conséquemment, toute action fut défermée jusqu'à ce que le fond fût bien établi. Entre temps, la situation dans l'ex-Union Soviétique ne s'est pas grandement améliorée: la recherche en astronomie est généralement peu subventionnée, plusieurs astronomes vivent sur des salaires équivalents à \$300 par année ou moins, et le manque de monnaie étrangère nuit grandement aux communications. Les membres de la CASCA présents a la réunion annuelle en juin approuvèrent le plan du conseil de la CASCA visant à entreprendre un modeste programme pour l'aide à court terme de l'astronomie en l'ex-Union Soviétique.

Au cours de la dernière année et demie, la société américaine d'astronomie (SAA) a entrepris une campagne d'aide financière par le biais de modestes octrois de recherche décernés suivant les recommandations d'un comité d'éminents astronomes de l'ex-Union Soviétique et d'un comité similaire de la SAA. Ce programme, qui connaît un grand succès, a déjà fourni de l'aide financière à au moins 400 chercheurs. Cependant, les organisateurs de ce programme nous ont indiqué que certains secteurs ont encore un grand besoin d'aide, ceux-ci incluent l'approvisionnement en équipement informatique et de communication, le financement de voyages à l'extérieur de l'ex-Union Soviétique et l'abonnement aux journaux scientifiques. Nous proposons donc à la société soviétique d'astronomie que la CASCA entreprenne, pour une période de deux ans, un programme d'allocations de voyages (pas

should propose another form of support where our limited funds could be more effectively and easily utilized, the details may well change. Speed, however, is of the essence and we are therefore launching an immediate appeal for funds in support of this initiative.

Please take time to consider whether the cost of one evening on the town could not be better spent in support of a young FSU astronomer who is now effectively cut off from the rest of the astronomical world by the foreign exchange crisis. If every CASCA member could contribute \$20 to this program for each of the coming two years, our goal of \$10000 would easily be met. We urge you to immediately send a cheque payable to "CASCA-FSU Fund" to the Treasurer of CASCA:

Dr. Christine Clement
Department of Astronomy
University of Toronto
60 St. George St
Toronto, Ont
M5S 1A7

Until we approach Revenue Canada with a draft formal agreement with the Soviet Astronomical Society, giving in detail the manner in which the funds shall be disbursed and to whom, we cannot be certain that donations can be channelled through Cascatrust. I hope that this will be possible. Therefore please fill out the following (or a similar) form and submit it with the cheque so that donations can be acknowledged and so that charitable receipts can be mailed to donors at a later date if and when the funds are transferred to Cascatrust.

Lloyd Higgs, Chair
Alan Batten
Peter Dewdney
Don MacRae
Russ Taylor
Bill Wehlau

plus de 500\$ américains chacun) destinées aux jeunes (40 ans et moins) astronomes de l'ex-Union Soviétique et servant à financer des courts voyages de recherche, que ce soit à l'intérieur ou à l'extérieur du pays; le programme serait géré par cette société. S'il advenait que la société soviétique d'astronomie propose une façon dont nos fonds limités pourraient être plus efficacement et facilement utilisés, les détails de ce programme pourraient changer. Quoiqu'il en soit, il est important d'agir rapidement et nous lançons donc immédiatement un appel pour le financement de cette initiative.

Prenez le temps de vous demander si le coût d'une soirée de loisir ne pourrait être mieux investi à aider un jeune astronome de l'ex-Union Soviétique qui est présentement coupé, à toutes fins pratiques, du reste de la communauté astronomique du monde à cause de la crise monétaire. Si tous les membres de la CASCA contribuaient \$20 par ans pour chacune des deux années, nous atteindrions facilement notre objectif de \$10000. Nous vous encourageons à envoyer immédiatement un chèque à l'ordre de "CASCA-FSU Fund" à la trésorière de la CASCA:

Nous ne pouvons être sûrs que les contributions pourront être distribués via Cascatrust avant d'avoir fait parvenir à Revenue Canada une ébauche d'une entente formelle avec la société soviétique d'astronomie décrivant en détail la façon dont les fonds seront déboursés et à qui ils seront destinés. J'espère que ce sera possible. Veuillez donc remplir le formulaire qui suit (ou un similaire) et le soumettre, accompagné d'un chèque, de façon à ce que des accus réception puissent être envoyés et que des reçus de charité puissent être expédiés ultérieurement aux personnes ayant contribué, quand et si les fonds sont transférés à Cascatrust.

**Contributions to date
have already swollen the
fund to more than \$1,000.
Ed.**

CASCA Committee for Support of FSU Astronomy

I, _____, wish to donate \$ _____
(please print name)

to the CASCA Campaign in Support of FSU Astronomy, and a cheque for this amount is enclosed.
Please mail the receipt, if and when available, to the following address:

Moi, _____, je désire contribuer
(nom en caractères d'imprimerie)

\$ _____ à la campagne d'aide financière de la CASCA pour l'astronomie en l'ex-Union
Soviétique et j'inclus un chèque à ce montant. Veuillez m'envoyer un reçu, quand et si disponible, a
l'adresse suivante:

MEETINGS/CONFERENCES

Kingston 1993 - YOUNG CIRCUMSTELLAR DISKS/LES DISQUES CIRCUMSTELLAIRES JEUNES
21-23 October, 1993, Université de Montréal
bastien@physcn.UMontreal.ca (Pierre Bastien)

183rd AAS Meeting
11-14 January, 1994, Washington, D.C.
Abstract deadline, Friday, 22 October, 1993
anonymous ftp from *blackhole.aas.org*

CASCA 1994
Late May or early June, 1994, University of Western Ontario
whwehlau@uwovax.uwo.ca (Bill Wehlau)

184th AAS Meeting
29 May - 2 June, 1994, Minneapolis, MN
twj@ast1.spa.umn.bitnet (T.W. Jones)

Hitting the High C's on Sabbatical Leave

Colin Scarfe

Having just completed my fourth sabbatical leave, I am torn between the feeling that I am very fortunate to have been privileged to enjoy so many, and the realization that, since they don't come that often, I am now rather a lot older than I was when I first began the employment that has led to them! This latter is a feeling that I am sure the new Editor will understand, since he completed an M.Sc. degree under my supervision shortly before I embarked on the first of them, and was working on his Ph.D. in Cambridge by the time I arrived there to begin it!

I thought I would write a few paragraphs about my recent wanderings, propelled by that version of the seven-year itch that is peculiar to academics, in the hope that they might provide readers with an alternative to the rather solemn fare that normally occupies most of these pages. So, to embark....Being so fortunate as to live in Victoria, it is all too easy to succumb to the temptation to remain close to home during a sabbatical, and sojourn in the friendly surroundings of the DAO, whose hospitality I did indeed enjoy for a substantial fraction of the past year. But in order to make the best use of a whole year of release from lecturing deadlines, inquisitive (occasionally pestering!) students, and the sublime academic joys (!) of Committees, one should take the opportunity to travel farther afield, and to find other, alien (if not extraterrestrial) brains to pick! And so I hit the high seas, or more precisely the airlines.....and spent several weeks at each of three more distant astronomical centres of excellence, all of them, as it happens, located in cities whose names begin with the letter C.

The first two were in Europe, and I was fortunate to be accompanied by my wife, who twisted her boss' arm for leave of absence from her job, and by a daughter in her late teens, who took a break between high school and university. Our first port of call was Copenhagen, a city full of interest, culture, and hospitality, with a crime rate so low as to shame Canadian cities one and all. Its only drawback is that most of the necessities of life cost roughly fifty percent

more than they do in Canada, at the current rate of exchange. Johannes Andersen, who kindly organized our accommodation, arranged for us to share the home of a very pleasant Danish family, whose advice and help made our stay much easier and more pleasant than it might have been. But this limited accommodation (two rooms and a shared bathroom) cost us about the same as a two-bedroom apartment in Vancouver would. However, it was within a short walk from the Observatory, and the public transport is so convenient that we never considered renting a car - just as well, since that too would have been expensive! I was fortunate to share the office of Bodil Helt, who went out of her way time and again to be helpful, despite both a heavy teaching load and the work of completing a fascinating paper on NJL5, an eclipsing blue straggler in Omega Centauri. The Observatory operates an efficient Unix-based computing system, and boasts an excellent library. At the time I was there, about half the staff were based not in the city but at Brorfelde, about 60 km away, on one of the higher hills in Denmark (about 100 m above sea level!). Nearly everyone spoke English, some of them better than do many Canadians (or British or Americans, for that matter). Indeed, as my daughter discovered, English is a compulsory subject in Danish schools, and most students learn two or three other languages as well! We rapidly found our way around, and enjoyed the pleasures of Copenhagen, including the Tivoli Gardens (where Walt Disney must have got his ideas for Disneyland), and the excellent opera and ballet performances at the Royal Theatre, both within walking distance of our lodgings. Indeed, so congenial did we find Copenhagen that after less than two months, on returning from a trip to Germany, we felt like we were coming home! (I should perhaps add, at this point, that in my spare time I actually did some work, and indeed realized an old ambition to write a paper on a star of zero apparent magnitude. It can be found in the May 1993 issue of PASP, and is by no means the last word on the fascinating system that is its subject!)

Our next stopping point was Cambridge, still just as much fun as it was on past visits, even when viewed from a totally different perspective. In my student days, thirty (yes, alas!) years ago, there were three separate astronomy groups, the radio people out on the Barton Road, the theorists in the Cavendish lab (then in the middle of town), led by Martin Ryle and Fred Hoyle (both knighted subsequently) respectively, who were in mutual controversy, and a small group in optical astronomy out on the Madingley Road, of which I was a member. Now of course the theorists have been on the latter site for over twenty years, and the once-quiet place is now a hive of activity, even more so because of the relatively recent move of the Royal Greenwich Observatory to an adjacent site. We were fortunate to discover that the Institute of Astronomy holds the lease on a house for the purpose of accommodating short-term visitors, and that it was available for the period of our visit. It was located near the river, downstream from the Colleges, about twenty minutes by bicycle from the Institute, at the leisurely speed befitting a grey-haired academic on sabbatical! What's more, the Institute supplied the bicycle from its stable of old but serviceable machines, and a route could readily be found along the river, to avoid Cambridge's congested traffic for much of the distance. Thanks to the spectacular drop last fall in the value of the pound, we found the cost of living in England to be comparable to that in Canada, although it is difficult to be more precise because of the differences between our life styles at home and away. We managed to keep warm and well-fed, as well as to do some travelling to visit friends and relatives, both by train and by rented car. We enjoyed browsing through Cambridge's superb book stores, but bought relatively little, partly because of the high prices, and partly with shipping costs in mind. Once again I managed to fit in some work(!), with the kindly help and advice of Roger and Elizabeth Griffin, as well as of several other people who assisted me with the intricacies of the Cambridge computer system and the U.K.'s unique electronic mail arrangements.

We returned to Canada at New Year, to enjoy a particularly fine winter (by west-coast standards!) which permitted me to

make up much of the observing I had missed in my absence. I did not venture forth again until the end of May, when I crossed the continent to spend a month in the Other Cambridge, at the Center for Astrophysics. My host there was David Latham, who generously allowed me not only to share his office, but also his home in the country, well outside the Greater Boston metropolis, and only a few hundred metres from the Oak Ridge Observatory. The latter boasts a 1.5 metre telescope which is allocated for about three quarters of each month to the radial-velocity programs of David's very active group. (Not satisfied with that they also use substantial amounts of time at a similar-sized telescope on Mt. Hopkins, as well as a small share of the MMT's time!) The result, not unexpectedly, is a flood of accurate observations that make my own efforts at DAO look modest indeed by contrast. Our purpose was to make a careful comparison of the two systems, and indeed we were delighted that they show excellent agreement on all the tests we could devise, aside from a small difference in zero-point. Although more of my stay in Massachusetts was devoted to work than had been the case in Europe, other attractions were by no means absent there. I had the interesting experience of attendance at Harvard University's Commencement (graduation) ceremonies, held outdoors in Harvard Yard on a beautiful sunny morning. The vast throng of visitors took some time to get settled, and the academic procession itself was a very informal affair lasting half an hour. However the speeches were short and full of wit, and honorary degrees were awarded not only to Colin Powell, but to Susan Sontag, Julia Child and Ravi Shankar, to name but a few! My wife joined me for the last week of my visit, and we were royally entertained for the final weekend by Martha Hazen and her husband Bruce McHenry at their Cape Cod retreat.

And so another sabbatical is over. But once again the value of such leave has been proven, in allowing an old dog to learn a few new tricks. With luck the benefits will be evident both to my students over the next few years and in the way I conduct my research.

CANADIAN ASTRONOMY PUBLICATIONS
June 9 to September 2, 1993

If you have a preprint or other Canadian publication, we would like to include it in this list. Please send a copy (or a photocopy of the title page) to:

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

A. PREPRINTS OF RESEARCH PAPERS

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

- Ananth, A.G., Leahy, D.A. *Infrared observations of symbiotic stars*. U Calgary, 13-Jul-1993.
 Babul, A., et al. *Testing the gravitational instability hypothesis?*. CITA, 29-Jul-1993.
 Bell, M.B. *The location of warm HC3N and warm HC5N gas in the circumstellar envelope of IRC + 10216*. HIA, 7-Jul-1993.
 Binette, L., Fosbury, R., Parker, D. *Interpretation of the ionizing photon deficit of AGN*. CITA, 29-Jul-1993.
 Blaes, O.M., Balbus, S.A. *Local shear instabilities in weakly ionized, weakly magnetized disks*. CITA, 14-Jun-1993.
 Blaes, O.M. *Theories of gamma-ray bursts*. CITA, 5-Jul-1993.
 Buonanno, R., Richer, H.B., Fahlman, G.G. *Young globular clusters in the Milky Way: Arp 2*. UBC, 13-Jul-1993.
 Carlberg, R.G., et al *Mapping moderate redshift clusters*. DAO, 28-Jul-1993.
 Clement, M.J. *Differential rotation and the convective core mass of upper main sequence stars*. DDO/U of T, 27-Jul-1993.
 Courvoisier, T.J-L., Leahy, D.A., et al *EUVITA - an extreme UV imaging telescope array with spectral capability*. U Calgary, 13-Jul-1993.
 Crabtree, D., et al *Pipeline processing, automatic image quality estimates and preview images of CFHT CCD images*. DAO, 28-Jul-1993.
 Durand, D., et al *The CFHT archive*. DAO, 28-Jul-1993.
 Freedman, W.L., et al *The Extragalactic Distance Scale Key Project. I. The discovery of cepheids and a new distance to M81 using the Hubble Space Telescope*. Obs. Carnegie Inst., 21-Jul-1993.
 Garrison, R.F., Gray, R.O. *The late B-type stars: refined MK classification, confrontation with Stromgren photometry, and the effects of rotation*. DDO/U of T, 18-Aug-1993.
 Garrison, R.F., Corbally, C.J. *The spectra of G dwarf stars towards the galactic poles*. DDO/U of T, 18-Aug-1993.
 Gaudet, S., Crabtree, D., Durand, D. *Astronomical archives and networks: made for each other*. DAO, 28-Jul-1993.
 Gies, D.R., et al *Binary star orbits from speckle interferometry. V. A combined speckle/spectroscopic study of the O star binary 15 Monocerotis*. Georgia State, 13-Jul-1993.
 Gomez de Castro, A.I., Pudritz, R.E. *The origin of forbidden line emission from young stellar objects*. VILSPA/McMaster U, 10-Jun-1993.

- Harris, G.L.H., FitzGerald, M.P.V., Mehta, S., Reed, B.C. *NGC 2287 - an important intermediate-age open cluster*. U Waterloo, 13-Jul-1993.
- Hogg, D.W., et al *A photographic search for satellites of Neptune*. CITA, 25-Aug-1993.
- Holdom, B., Malaney, R.A. *Neutrino balls and gamma-ray bursts*. CITA, 5-Jul-1993.
- Hutchings, J.B., Crampton, D., Persram, D. *Galaxy clusters with QSOs at redshift 1.1*. DAO, 28-Jul-1993.
- Irwin, J.A., Caron, B.L. *The NGC 5775/4 interacting system*. Queen's, 30-Jul-1993
- Iverson, R.J., Bode, M.F., Meaburn, J. *An atlas of high resolution line profiles of symbiotic stars: II. Echelle spectroscopy of northern sky objects*. DDO/U of T, 21-Jul-1993.
- Leahy, D.A. *Recent progress in understanding of X-ray pulsars*. U Calgary, 13-Jul-1993.
- Leahy, D.A. *Image deprojection applied to supernova remnant X-ray images*. U Calgary, 13-Jul-1993.
- Leahy, D.A., Volk, K. *Image deprojection applied to the Einstein Cygnus loop X-ray image*. U Calgary, 13-Jul-1993.
- Leahy, D.A. *X-ray spectra reprocessed in an exponential disk*. U Calgary, 13-Jul-1993.
- Leahy, D.A. *Pulse phase dependent iron line emission from GX301-2*. U Calgary, 13-Jul-1993.
- Leahy, D.A., Ananth, A.G. *Infrared variability of X-ray sources*. U Calgary, 13-Jul-1993.
- Lee, M.G., Freedman, W.L., Madore, B.F. *Stellar populations in the dwarf elliptical galaxy NGC 185*. IPAC, 18-Jun-1993.
- Lee, M.G., Freedman, W.L., Madore, B.F. *The tip of the red giant branch as a distance indicator for resolved galaxies*. IPAC, 18-Jun-1993.
- Leonard, P.J.T., Hills, J.G. *The detection of small asteroids in the final days before earth impact*. Los Alamos Ntl. Lab. 24-Jun-1993.
- Matthews, J.M., Moffat, A.F.J. *WR 40: coherence or chaos?*. UBC, 16-Aug-1993.
- Morbey, C., Hutchings, J.B. *FES camera designs and performances for the Lyman FUSE telescope*. DAO, 28-Jul-1993.
- Murowinski, R., Deen, M.J. *Low temperature characteristics of large array charge coupled devices*. DAO, 28-Jul-1993.
- Percy, J.R., Csatary, A., Zorndrager, I. *Period changes in RV Tauri stars: observations and simulations*. DDO/U of T, 20-Aug-1993.
- Percy, J.R. *The photometric variability of K giants*. DDO/U of T, 30-Aug-1993.
- Percy, J.R. *Variable stars, photoelectric photometry, science education, and the AAVSO*. DDO/U of T, 24-Aug-1993.
- Pudritz, R.E., Ouyed, R. *Forbidden line diagnostics of disk winds in YSOs*. McMaster U, 10-Jun-1993.
- Smith, H.A., Matthews, J.M., et al *AH Cam: a metal-rich RR Lyrae star with the shortest known Blazhko period*. UBC, 13-Jul-1993.
- Syer, D., Saha, P. *Bookmakers' odds for anisotropic models of the sky distribution of gamma ray bursts*. CITA, 29-Jul-1993.
- Turner, D.G., Mandushev, G.I., Forbes, D. *Galactic clusters with associated cepheid variables. IV. C2128+488 (Anon. Platais) and V1726 Cygni*. St. Mary's, 10-Aug-1993.
- van den Bergh, S., McClure, R.D. *Extragalactic supernova rates*. DAO, 23-Jul-1993.
- van den Bergh, S., Morris, S. *Third parameter effects in globular clusters*. DAO, 23-Jul-1993.
- van den Bergh, S. *How rare are supernovae?*. DAO, 23-Jul-1993.
- van den Bergh, S. *The enigmatic supernova S Andromedae*. DAO, 23-Jul-1993.
- Zhang, C.Y., Leahy, D.A., Kwok, S. *The ROSAT X-ray spectrum of the Helix Nebula*. U Calgary, 13-Jul-1993.
- Zuo, L., Lu, L. *Measurements of D A for a large QSO sample and determination of evolution of Ly alpha clouds*. CITA, 5-Jul-1993.

B. PUBLICATIONS

- Graduate workshop on star formation* / edited by J.-P. Arcoragi, P. Bastien, R. Pudritz.
Département de Physique, Université de Montréal, c1993
- The multi-universe cosmos : the first complete story of the origin of the universe*.
A. Karel Velan. -- Plenum Press, c1992

DUES REMINDER

Dues for the membership year 1993 October 1 to 1994 September 30 are now payable to the Treasurer.

Ordinary membership	\$35.00	
Reduced Rate	\$14.00	(Retired & over 60, Full-time students)
Student membership	\$14.00	
Corporate Membership	\$75.00	

NOMINATION FOR IAU MEMBERSHIP/INVITED PARTICIPANT

The Canadian National Committee of the IAU (consisting of the CASCA Board of Directors) invites qualified Canadian astronomers to apply for nomination to membership in the IAU, or for invited participant status at the forthcoming 1994 IAU General Assembly in The Hague, The Netherlands. If you (or anyone of whom you are aware) are interested in IAU membership, or invited participant status, please arrange to have the following nomination form filled out and returned to the Secretary of the Canadian National Committee. The normal qualifications for membership are: (1) Canadian citizenship or Landed Immigrant status, (2) current employment in Canada, (3) a Ph.D. received prior to August 15, 1991, or demonstrable equivalent research experience, and (4) active involvement in astronomy. An application for membership should be submitted by a current Canadian IAU member. Persons nominated by the Canadian National Committee will be automatically invited to attend the 22nd General Assembly in 1994.

Nominations are also solicited for persons to be invited to attend the 1994 General Assembly because they can make a valuable contribution to it (e.g. invited papers or reports or discussions on particular subjects at commission meetings, colloquia, or symposia). Invited Participants are normally representatives of other international or national organizations, "young" astronomers (potential members of the IAU), or distinguished scientists who are active in other fields having a direct impact on astronomy. An IAU member should nominate a prospective invitee, describe the expected contribution, and provide any supporting documents (e.g. a letter of invitation from a Commission President).

The IAU also wishes to know of any members who wish to resign from the Union for any reason (e.g. age, change of sphere of activity, etc.). If you should fall into this category, please notify the Secretary of the Canadian National Committee. Resignation is entirely voluntary, but it is encouraged, because of the costs involved in sustaining a membership, in those instances where IAU membership is no longer desired.

Finally, IAU members who wish to join a specific IAU commission should write to the Chairman of that commission to apply for membership. Members should note, however, that the IAU Commissions are currently being restructured and some existing commissions may disappear.

All nominations must be received no later than Monday, November 15, 1993, by the Secretary in order to be considered at the next meeting of the Canadian National Committee.

Dr. Austin F. Gulliver
Secretary, Canadian National
Committee of the IAU
Dept. of Physics & Astronomy
Brandon University
Brandon, Manitoba
R7A 6A9

**NOMINATION FORM FOR
IAU MEMBERSHIP/INVITED PARTICIPANT**

Nomination for (please indicate): Membership Invited Participant

Name: _____

Address: _____

Place and Date of Birth: _____ Citizenship Status in Canada: _____

Education (list degrees, and, for each, institution, field and year):

Main Fields of Research: _____

Titles and References of Not More Than Three Scientific Publications:

Suggested for Membership in Commission Number: _____ (not relevant for invited participants)

Proposed by (please print): _____

Signature of Proposer: _____

Date: _____

Please return to Dr. Austin F. Gulliver, Secretary CNCIAU, Department of Physics and Astronomy,
Brandon University, Brandon, Manitoba R7A 6A9.

All nominations must be received by 15 November, 1993.

THE UNIVERSE

No. 21 - Summer 93

IN THE CLASSROOM

Sponsored by - Astronomical Society of the Pacific - Canadian Astronomical Society - American Astronomical Society - International Planetarium Society

BLACK HOLES

John Percy, University of Toronto

Gravity is the midwife and the undertaker of the stars. It gathers clumps of gas and dust from the interstellar clouds, compresses them and, if they are sufficiently massive, ignites thermonuclear reactions in their cores. Then, for millions or billions of years, they produce energy, heat and pressure which can balance the inward pull of gravity. The star is stable, like the Sun. When the star's energy sources are finally exhausted, however, gravity contracts the star unhindered. Stars like the Sun contract to become white dwarfs—a million times smaller than water. If the collapsing star is more than 10 solar masses, it overwhelms the quantum pressure and the star collapses to become a neutron star, a million times denser than water, and supported by quantum forces between nucleons.

The energy released in

MYTH: Black holes are very dense.

TRUTH: Small and medium black holes are very dense, but a supermassive black hole—with a 100 million solar masses, for example—would have a density the same as water. [You can work this out from the mass of the black hole and the radius of its event horizon; this assumes that all of the matter is distributed within the entire event horizon, not just in the singularity.]

Another way to say it, is that a black hole is an object for which the escape velocity (the velocity required to break free from an object) is greater than the speed of light—the ultimate “speed limit” in the universe.

In 1783, British amateur astronomer John Goodricke realized that the motion imparted to the stars by the pulsations of the star was evidence of a companion star.

A sample of the ASP Newsletter, *The UNIVERSE in the Classroom*, supported by CASCA Trust. If you are interested in passing on a copy or mailing copies to local teachers please contact:

Dr. Richard Bochonko,
Chairman, CASCA Education Committee
Dept. of Mathematics & Astronomy
University College
University of Manitoba
Winnipeg, Manitoba
R3T 2M6

Black Holes, 1978

THE UNIVERSE IN THE CLASSROOM

Number 24 Summer 1993

This newsletter is available free of charge to teachers, school librarians and administrators, and youth group leaders who request it on institutional stationery. Address all correspondence to:

Teachers Newsletter Dept.
390 Ashton Avenue
San Francisco, CA 94112

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Editor: Sally Stephens
Design: Joseph O'Sullivan

This newsletter is funded in part by grants from:
The Hearst Foundation, through a grant to the Phoebe Apperson Hearst Fund of the ASP

The Bart Bok Memorial Fund of the ASP
Associated Universities, Inc. and the NRAO

Minutes
of the twenty-fourth
Annual General Meeting
of the
Canadian Astronomical Society / Société Canadienne d'Astronomie
June 4, 1993
University of Victoria
Victoria B.C.

L. A. Higgs, President of the Society, called the meeting to order at 13:30 PDT with some 50 members present.

1. Motion to adopt minutes of 1992 AGM.

Motion 1.

*Moved by D. A. Hanes, seconded by A. B. Underhill, that:
the Minutes of the 1992 Annual General Meeting, published in the 1992 Autumnal Equinox issue of Cassiopeia, No. 76, pp. 2-9, be adopted as read.*

Carried.

2. Business Arising.

The President reported that the past practice of choosing a Society member as auditor had been legally correct. Nevertheless, the Board has decided to employ the services of a professional auditor in the future. The President expressed gratitude to N. R. Evans on behalf of the Society for her efforts in recent years.

The President noted that he had sent a letter on behalf of the Society to Helen Sawyer Hogg congratulating her upon the dedication of the Helen Sawyer Hogg Telescope of the University of Toronto Southern Observatory.

3. Appointment of Scrutineers.

The President called for volunteers. A. B. Underhill and D. G. Turner volunteered to act as scrutineers.

4. President's Report - L. A. Higgs.

The President commented on the state of astronomy in Canada. He remarked that the program for the Canadian participation in the Gemini project had reached a state of relative stability. In radio astronomy it was noted that the Canadian participation with Caltech in the Owens Valley Radio Observatory represented an important step that now appeared to have the necessary funding in place.

On behalf of the Society the President expressed thanks to J. D. Fernie upon his retirement as Editor of Cassiopeia and his appreciation to J. E. Penfold of Mount Royal College who will be taking on this role. The President also thanked A. R. Taylor and D. Crampton for their service as CASCA Directors. It was noted that an IAU committee on Light Pollution and Space Debris will be formed with G. Hill of the DAO as chairman. In addition the Theoretical Committee of CASCA will be reconstituted.

5. Secretary's Report - A. F. Gulliver.

The Secretary reported that the present membership of the Society included a total of 430 members, 336 Ordinary, 88 Student, 3 Honorary and 2 Corporate. During the last year the Society suffered the loss of Helen Sawyer Hogg. Some 15 members had either resigned or had been suspended by the Board of Directors for non-payment of dues including a Corporate member, NATURE. Since the last Annual General Meeting, there had been 24 new members admitted to the Society. They included:

New Members Admitted June 4, 1993

Adelman, Saul J.	The Citadel
Babul, Arif	CITA
Bartel, Norbert	York University
Bernardeau, Francis	CITA
Brown, Chris	University of Manitoba
Gower, Ann	University of Victoria
Merryfield, William	University of Victoria
Moriarty-Schieven, Gerald	DRAO
Neuschaefer, Lyman	Johns Hopkins University
Rigler, Michael	DAO
Smecker-Hane, Tammy	DAO
Widrow, Larry	Queen's University
Wilson, Christine Diana	McMaster University

Transferring from Student to Ordinary

Brassard, Pierre	Universite de Montreal
Kingsburgh, Robin	Universidad Nacional Autonoma de Mexico
Martin, Pierre	Steward Observatory
Robert, Carmelle	Space Telescope Science Institute
Thornburg, Jonathan	University of British Columbia

Student Members Admitted June 4, 1993

Brewer, James	University of British Columbia
Bryan, Greg	University of Illinois
Dinshaw, Nadine	University of Arizona
Hodder, Philip	University of British Columbia
Peracaula, Marta	University of Calgary
Pen, Ue-Li	Princeton University

6. Treasurer's Report - C. M. Clement.

The Treasurer reported that the the firm of Tinkham and Associates had been nominated as auditors for the Society. It was also noted that the full Financial Statement will appear in the Autumnal Equinox issue of Cassiopeia. Two items were mentioned specifically: the purchase of a GIC for \$1000. and the transfer of funds to Cascatrust. (*See the Summer Solstice issue for the Financial Statement, Ed*)

Motion 2.

**Moved by A. F. Wehlau, seconded by P. A. Delaney, that:
the Treasurer's Report for the Society and Cascatrust be accepted.**

Carried.

7. Appointment of Auditor.

Motion 3.

*Moved by A. H. Batten, seconded by P. E. Dewdney, that:
the firm of Tinkham and Associates be appointed as Society auditors.
Carried.*

8. Cascatrust.

D. Crampton reported on the role of Cascatrust including a summary of the activities to be supported. It was stated that an appeal for donations will be included in the upcoming dues notices.

9. Support for FSU Astronomers.

The President noted that Cascatrust may possibly now play a role in the provision of support for the former Soviet Union (FSU) astronomers by means of an agency agreement with the Soviet Astronomical Society, as suggested by Revenue Canada. On being asked if they supported such an initiative, the members indicated general agreement. W. H. Wehlau and A. H. Batten agreed to assist in this initiative.

10. Committee Reports.

Awards Committee - W. H. Wehlau.

The Plaskett Medal was awarded to Pierre Brassard. The Beals Award will be presented next year.

Education Committee - D. R. Bochonko.

Members were reminded of the activities of the Journals Program, the Job Registry and the Universe in the Classroom Newsletter. A. H. Batten specifically mentioned the Gaza Library Project for which contributions can be sent to P. A. Delaney or D. W. Brueckner. Current issues of journals would be appreciated and completed volumes for the past year would be especially useful.

Heritage Committee.

No report was presented.

Optical and Infrared Astronomy Committee - D. L. Welch.

New committee members D. Nadeau and T. Davidge will replace retiring members R. Racine and H. K. Yee.

The deliberations of the Houck Committee concerning the Gemini Project were summarized. The Houck Committee endorsed the international collaboration and the combined IR/optical telescope concept. In the end, the project was empowered by the NSF to choose the appropriate mirror technology.

G. A. H. Walker noted that the manufacturer of the Aurel 4096 x 200 CCDs was going out of business and that anyone interested in such CCDs should contact him.

Radio astronomy Committee - A. R. Taylor.

The establishment of an Allen Yen Memorial Scholarship Fund at the University of Toronto was reported. Those interested in contributing were asked to contact A. R. Taylor.

It was reported that five important initiatives were underway in radio astronomy. They include: 1) the upgrading of the DRAO Synthesis Telescope from 4 to 7 antennas with new spectrometers, 2) the successful JCMT CTAG experiment, 3) the Caltech-Canada Millimeter Array project which, with the addition of a seventh antenna supported by an eight university Canadian consortium, will provide a one-seventh observing share to Canadians, 4) the RadioAstron SVLBI project for which Canada will supply the S-2 recording systems and correlator, and 5) the ODIN mission led by Sweden for which the CSA has expressed an interest in providing the digital spectrometer.

Space Astronomy Committee (JSSA) - D. A. Leahy.

It was noted that the JSSA also reports to the CSA as an advisory body. The missions in which Canada is now involved include: 1) Lyman / FUSE which has been descopeped to a smaller instrument, 2) Spektrum Roentgen-Gamma, which will be the first to be launched, and 3) RadioAstron. It was reported that the CSA is involved in a long-term planning exercise, including end-to-end funding, and the development of a Canadian small satellite program.

11. Report on status of Gemini - G. A. H. Walker.

It was reported that the financial launching of Gemini was very near completion. Canada would have a 13.6% share of the observing time for its 15% contribution (currently Cdn \$26.4 million). The Mauna Kea telescope would see first light in 1998 and its Cerro Pachon counterpart in the year 2000. Details of the Project Office, Steering Committee and Instrumentation Working Groups were presented. The adaptive optics properties, telescope and enclosure design and mirror support were discussed.

12. Report from CTAC (CFHT) - C. J. Pritchett.

The Canadian Time Allocation Committee for the CFHT presented the observing statistics for the previous semesters. It was noted that the scheduling periods had been shifted forward by one month. Some limited service observing would be available for FOCAM and Redeye. Submission of observing proposals by e-mail would be possible in the future. As well a standard LaTeX template for the proposals would be available.

13. Report from CTAG (JCMT) - C. Rogers.

The Canadian Time Allocation Group for the JCMT reported briefly on their activities. Present members include P. Bastien, P. A. Feldman, J. A. Irwin, G. F. Mitchell and C. Rogers. Two members will be replaced at the end of this term. It was reported that the previous low representation of graduate students among observers will be remedied in the upcoming semesters.

14. Motions from Floor.

There were no motions from the floor.

15 Nominations to 1993 Nominating Committee.

The Board presented the names of two nominees, R. Racine and L. W. Avery, for the 1993 Nominating Committee. Members wishing to nominate other candidates should forward such nominations in writing to the Secretary. It was also noted that a 2nd vice-president will be elected next year.

16. Future CASCA Meetings.

W. H. Wehlau invited members to attend the 1994 meeting which will be held at the University of Western Ontario. The theme of the meeting had not yet been decided although a suggested topic was stellar astronomy. An excursion to a Stratford play was also being considered. The meeting will be held in the last week of May or the first week of June.

The 1995 meeting will be held the last week of May in Penticton. The theme will probably be in the area of galactic radio astronomy.

The 1996 meeting will held at Queen's. Dates have not yet been selected.

17. Report of Nominations to CITA Council.

The Board nominated G. F. Mitchell to CITA Council.

18. Results of Election for Two Directors.

The President read the results of the election as reported by the scrutineers. H. B. Richer and C. Carignan were declared elected as Directors of CASCA.

Motion 4.

*Moved by D. A. Hanes, seconded by C. M. Clement, that:
the ballots be destroyed.*

Carried.

19. Other Business.

J. B. Tatum raised the issue of whether charter members of the Society would be indicated as such in future issues of the Membership Directory. The President indicated that the Board had already decided to do so.

20. Adjournment.

Motion 5.

*Moved by D. A. Hanes, seconded by C. M. Clement, that:
the meeting be adjourned.*

Carried.

Lloyd A. Higgs, *President*

Austin F. Gulliver, *Secretary*

CASCA BOARD OF DIRECTORS

President	L. Higgs, D.R.A.O.	lah@drao.nrc.ca
First Vice-President	W. Harris, McMaster University	harris@physun.physics.mcmaster.ca
Second Vice-President	J-R Roy, Université Laval	1150005@saphir.ulaval.ca
Secretary	A. Gulliver, Brandon University	gulliver@brandonu.ca
Treasurer	C. Clement, U. of Toronto	cclement@vela.astro.utoronto.ca
Directors	C. Carignon, Université de Montréal	claudc@astro.umontreal.ca
	H. Richer, U. of British Columbia	richer@geop.ubc.ca
	S. Rucinski, ISTS-SAL York U.	rucinski@nereid.sal.ists.ca
	S. van den Bergh, D.A.O.	vandenbergh@dao.nrc.ca
Past President		

CASCA COMMITTEE CHAIRS

Awards	W.H. Wehlau, U.W.O.	whwehlau@uwovax.uwo.ca
Education	R. Bochonko, U. of Manitoba	bochonk@ccm.umanitoba.ca
Heritage	R. Jarrell, York U.	rjarrell@vm2.yorku.ca
Optical & Infrared Astronomy	D. Welch, McMaster U.	welch@physun.physics.mcmaster.ca
Radio Astronomy	R. Taylor, U. of Calgary	russ@ras.ucalgary.ca
Space Astronomy	D. Leahy, U. of Calgary	leahy@iras.uclagary.ca
Theoretical Astrophysics	(vacant)	
1992 Nominating	S. van den Bergh, D.A.O.	vandenbergh@dao.nrc.ca

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DEADLINES FOR THE WINTER SOLSTICE ISSUE:
E-MAIL: DEC 7 OTHER: NOV 30

CASSIOPEIA

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