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On the Cover

Jayanne English et. al. award winning image of GS 62.1+0.2-18. For details see John Percy's congratulatory feature about Jayanne!

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E-Cass Soap Box

Welcome to the Winter Solstice 2006 E-Cassiopeia. Many authors contributed to a very full and informative issue. Perhaps, the with hectic last minute rush of the season nearly abated you will have a few minutes to peruse this issue. Russ Taylor and Sean Dougherty provide a very informative update on the SKA while John Percy congratulates Jayanne English for some wonderful imaging done with VLA data. The board has provided some useful notes on newly announced award and NSERC envelop funding. As well, our usual collection of reports and news updates rounds out the issue.

We also note, with sadness, the passing of a great Canadian astronomer, Donald Alexander MacRae (1916-2006)

Merry Christmas and all the best in the coming new year!

Brian Martin (brian.martin@kingsu.ca)

From the President

It is important to set goals and as President of CASCA for the next couple of years my priorities are:

- as the co-chair of the Coalition for Canadian Astronomy, to find funding for all aspects of the LRP,
- to complete the dialog with NSERC re envelope funding for astronomy and astrophysics,
- to ensure that the planning for IYA2009 and E&O activities get the attention and resources they deserve, and
- to start the process for the next decadal plan for astronomy in Canada

Of course there is also the smooth running of the many activities of the Society. For that I appreciate and am grateful for the dedication and talents of the Board and of the many members who have stepped forward for the important work on CASCA committees.

Just as Rome was not built in a day, nor will these goals be achieved instantaneously, barring some uncharacteristic focus in Ottawa. Lest these goals suffer the fate of most “New Year’s resolutions” it is important to have benchmarks for whether progress is being made and to record evidence that we are making headway, and why.

The Coalition is a remarkable creation which continues to benefit from the dedication, talent, and creativity of all its players. The goal is to provide stable funding for the LRP to keep us in a leadership role on the international scene. Getting a Memorandum to Cabinet is challenging, as is finding a government in power long enough to pass a budget with a long term science focus! We continue to have good responses from individual MPs in all parties, at the root of creating a climate of “favorable conditions.” Recent Coalition highlights include the multi-agency Working Group, a supportive report from the Finance Committee, and a private member’s motion to be debated in the House. There is much ongoing work to do.

As we develop the major facilities envisioned in the LRP, we must keep in mind the “cradle to grave” costs. Major phases are concept and design, construction, operation, and exploitation. Even when construction costs can be obtained, operation costs can remain a challenge because they are on a horizon longer than usual funding commitments. On this same longer time scale we need funding for doing the science that is enabled by these facilities, often in collaboration or competition with our

international partners. From an audit point of view, it would seem irresponsible not to have funding mechanisms and levels that will ensure that the best possible science is achieved. Science exploitation is if fact central to what most in our community do, in our research HQP training, and outreach, and so adequate funding is also essential to the health and renewal of our science. I think that we are still far from the ideal here, in part structurally (see, e.g., the Working Group report), and that this aspect of the LRP is so far proving to be the most challenging to deliver. We clearly need to make effective use of the funding available through NSERC programs and to increase that funding. More funding is certainly needed as recognized in the LRP. This is not greed. It is simply to ensure that the ambitious projects already capitalized (mostly not even coordinated with NSERC) can deliver effectively; otherwise, money will have been wasted and our international partners will be the ones gaining from our joint investment. Personally I think that the concept of an "envelope" of funding *specifically for astronomy and astrophysics* has a lot of upside potential. The idea of such an envelope has been broached by NSERC since at least as early as 2001 but for various reasons has never got much traction. I think that it is high time to become seized of this possibility, molding it to our needs or proposing some alternative that is even better. A community sufficiently mature and united to have an LRP also needs to have planning tools like envelope funding in place. Just as in other aspects of the LRP, where nothing can be taken for granted, we must create opportunities to take responsibility for our science. A new discussion with NSERC is about to begin which the Board endorses (see separate article). Unfortunately with the proposed timetable any changes would be too late to address the long foreseen and pressing needs for exploitation of Herschel, Planck, and the new instruments on JCMT.

Education and Outreach have been a strong suit in our Society, thanks to individual efforts and the dedicated and enterprising E&O Committee. It is clear to the Board how much more could be done with appropriate levels of funding. This was highlighted in the LRP but so far the potential has not been fulfilled. An opportunity to rise to another level of activity is presented by the International Year of Astronomy 2009. The Board has put in place a new IYA2009 Committee that brings together the many stakeholders. Jim Hesser has kindly agreed to be our point of contact with the IAU while further organization takes place.

A persuasive case can be made that progress in our science will depend more and more on the synergy between ground and space-based activities. While it might be ideal to have a single agency – say an Astronomy Canada working with ACURA – to focus federal funding, the situation now is that we deal with many agencies, still in a fractured way well documented by the Working Group. That, however, should not stop the Society from developing another decadal plan that is clearly science driven. The Board

has supported the recent CSAW as a first essential step and commends the work of the JCSA in this respect (see report by Rene Doyon). A great benefit for the Coalition as it promotes the LRP is that it can rightly be said that our community has made tough choices. That said, many of the major facilities that we propose take more than a decade to put in place, and on that timescale new opportunities surely arise with the potential to alter the request for funding. Therefore, along with decadal plans and mid-term reviews we might need to think of other living structures, for which names like “framework” and “vision” have been used in other jurisdictions.

These are busy times on many fronts and 2008 will be no less so. If a holiday opportunity comes your way, enjoy it!

Feature Articles

Square Kilometre Array Developments

Russ Taylor, University of Calgary
Sean Dougherty, Herzberg Institute of Astrophysics

This year has seen very significant developments in the Square Kilometre Array project. Early in the year, the International Square Kilometre Array Steering Committee (ISSC) agreed on a reference design for the SKA, consisting of a square kilometre of 10 to 15 metre class antennas with “smart” receivers, combined with a smaller central array of aperture plane receivers for operation at the very lowest frequencies (see Figure 1.) In the 300 MHz to 3 GHz range phased-array systems at the focus of the parabaloids will be used to obtain very large instantaneous field-of-view, enabling the SKA key science through surveys of the line and continuum emission from large volumes of the Universe.

Figure 1. A concept drawing of a portion of the SKA showing the reference design, consisting of 10-15 metre diameter parabolic reflectors with “smart” feeds for large field-of-view, along with a compact core of aperture plane array receivers for all-sky imaging and monitoring at the lowest frequencies.

SKA site proposals were submitted to the ISSC from Australia, Argentina/Brazil, China, and South Africa. All the site proposals were subjected to technical review this year. Ernie Seaquist served on the International SKA Site Advisory Committee that provided external expert advise to the process. At the August ISSC meeting in Dresden, the potential sites for the SKA were short-listed to two; the Mileura site in Western Australia and the Karoo site in South Africa (see Figure 2). The sites in Argentina and China suffered from ionospheric instability due to their locations with respect to the geomagnetic equator. In addition the Chinese site, which depends on formations in the karst mountains of south-central China, was too restrictive to allow an optimal array configuration over the 3000 km extent required for the SKA.

Figure 2. The two short-listed sites for the SKA; the Karoo region of South Africa (top) and Mileura, West Australia (bottom)

Following the adoption of the SKA reference design, the Canadian SKA Consortium Board, the Canadian SKA Science Advisory Committee and HIA explored several options for the direction of the Canadian SKA program. In June 2006 they recommended that Canada collaborate with Australia in research and design leading to the construction of an SKA pathfinder telescope at the Mileura site that is based on the international SKA reference design. This pathfinder, called the Mileura International Radio Array, will be an expansion to the Australia xNTD program to create a scientifically capable telescope that will begin early science around 2012. On November 30, the President of the National Research Council of Canada and the Chief Executive Officer of the Australia Commonwealth Science and Industrial Research Organization (CSIRO) confirmed their intent to cooperate on the realization of the Mileura International Radio Array. The Agreement recognizes the Australian and Canadian national priorities to participate in the Square Kilometre Array and declares our intention to jointly develop MIRA in a manner that is consistent with the first 1% of the SKA. The Canadian role in MIRA is contingent on further LRP funding as recommended by the LRP Mid-term Review Committee.
The Canadian SKA Science Advisory Committee (CSKASAC), chaired by Norbert Bartel, is working on a Canadian MIRA science specifications document in preparation for a joint Australia-Canada science meeting in March 2007.

Since mid 2005, a seven-member working group of funding agency representatives has been meeting to discuss the funding and governance mechanisms for the International SKA project. Greg Fahlman, Director General of NRC-HIA, represents Canada on this working group. At its meeting in Prague in August 2006, the Funding Agency Working Group recommended that an International SKA Forum be established to develop the international governance model for the SKA. In the meantime the international MOU to establish the International SKA Steering Committee has been extended to 2007. The Canadian

members on the ISSC are Peter Dewdney and Russ Taylor.

On October 19, the European Strategy Forum for Research Infrastructure (ESFRI) published it roadmap for new large-scale research infrastructure for the next 10-20 years, which includes the SKA. As a result the European Union has invited the International SKA project to submit an FP7 preparatory phase proposal for implementation of the SKA. Canada is participating along with the other members of the International SKA project in the development of this proposal.

Meanwhile, the US SKA Consortium has submitted a TDP (Technology Development Program) proposal to the NSF in November for approximately $10 M USD. This proposal had been held up until the completion of the NSF Senior Review. The TDP is primarily a technology study on the cost/performance of 10-15m class antennas. Canada and Australia are participating as collaborators in aspects that are aligned with MIRA technology development.

Canadian SKA Technology Research and Development

Technical collaboration on MIRA between the HIA radio astronomy technology group (led by Peter Dewdney) and R&D teams at CSIRO is well advanced. Canadian technology development builds upon the expertise in focal-plane phased-arrays and advanced materials engineering that is the legacy of the Large Adaptive Reflector project. The refocusing of the SKA project, Canada is now concentrating on two key technologies for the Reference Design.

Phased Focal Plane Arrays.

Development of focal plane arrays based on broad-band Vivaldi antennas continues apace at HIA DRAO in Penticton. The Phased Array Demonstrator (PHAD) project aims to build a 180-element array using commercial off-the-shelf (COTS) receivers and digital signal processor (DSP) to expedite design and provide an array for engineering tests. All components of the system, from array elements to receiver boards, to the analogue signal transmission system and to the DSP beam former have now been prototyped. These components are currently being put through qualification testing, before fabrication of the full 180-element array.

Many PHAD tests will be made in the new anechoic chamber at DRAO with a state-of-the-art spherical near-field scanner. A renewed effort in systems simulations of phased arrays on radio telescopes is underway currently, to prepare for placing the PHAD array on a radio telescope.

At the University of Calgary Department of Computer and Electrical Engineering, recent successful prototyping of an uncooled, low-noise, broad-band amplifier promises to provide a solution to the integration of high-performance, inexpensive receivers into the very large number of receiver array elements that will be required for the SKA.

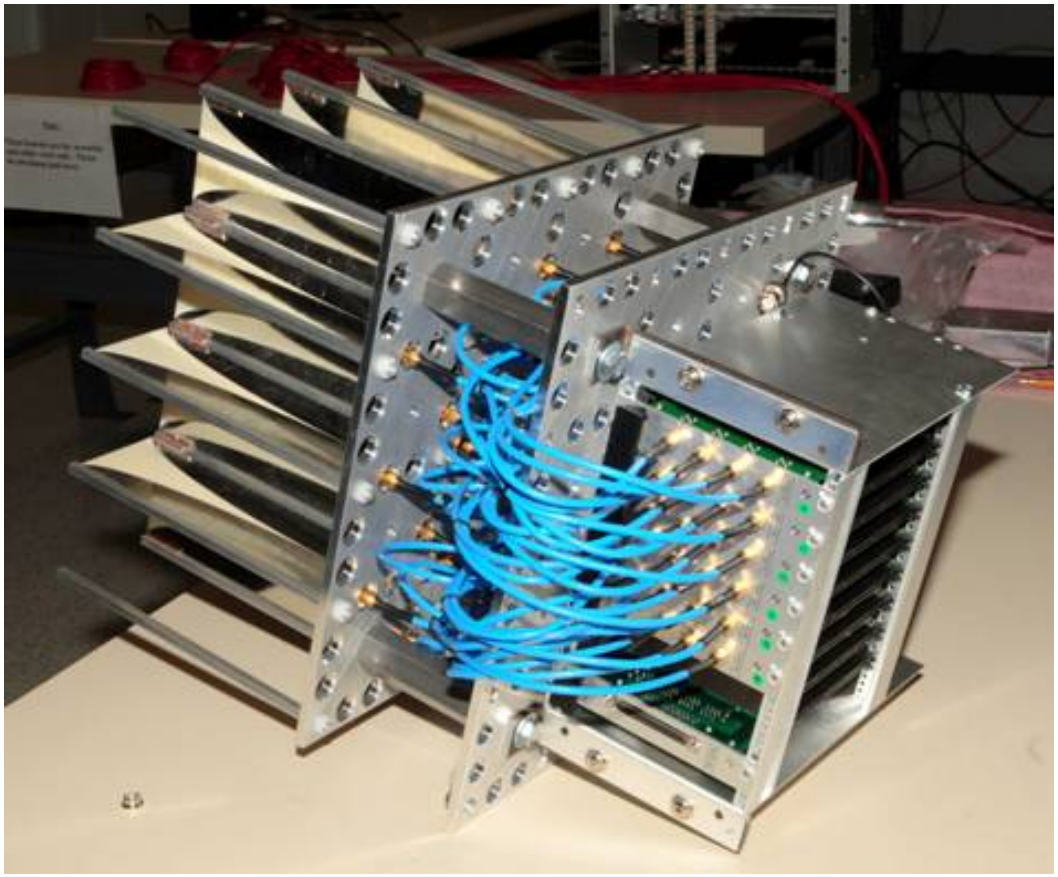

Figure 3. The proto-type 24-element PHAD phased-array feed and receiver system. The Vivaldi elements are visible on the left with the COTS receivers on the right. This system is being used for end-to-end system tests prior to fabrication of the full 180-element array.

Composite Applications to Radio Telescopes

Before the announcement of the SKA reference design, some exploratory design studies of composite parabolic reflectors had been carried out at DRAO as an alternative to the LAR for addressing the challenge of designing cost-effective collecting area for the SKA, which remains one of the outstanding technology challenges facing the SKA project. The results of those studies showed great promise and resources were redirected toward a new project, Composite Applications to Radio Telescopes (CART), targeting the fabrication of antennas for the SKA Reference Design.

CART is being carried out in two phases. The first phase, near completion, is the investigation of preliminary designs and cost estimates, fundamental material properties testing, culminating in the construction a small (~1-m diameter) reflector to verify RF performance of composite reflectors.

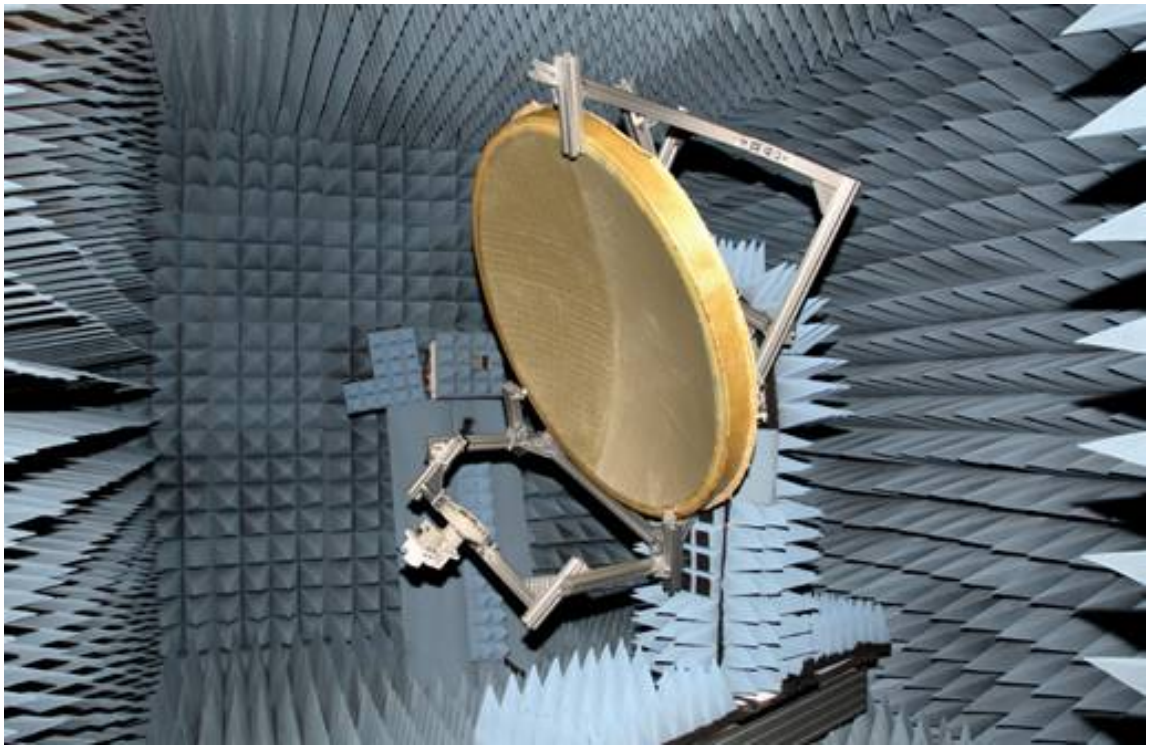

Figure 4. A 1-metre CART prototype reflector under test in the near-field scanner range at HIA DRAO.

The second phase is the design and construction of a prototype 10-m diameter radio telescope to demonstrate the complete concept feasibility of composite antennas and verify cost estimates. This phase has been in progress since summer 2006 and a Preliminary Design Review was held in October at DRAO, with a board of reviewers from the Australia Telescope National Foundation, the Allen Telescope Array, AMEC Dynamic Structures and DIAB (composite core materials manufacturer). The panel was impressed with the project concept and objectives, the progress to date and the team's expertise. They provided constructive feedback and gave a strong positive endorsement to continue with the prototype development for this competitive antenna technology. Currently the team is hard at work preparing to build the 10-m prototype. The necessary mold is on order and the LAR aerostat hangar is being converted into a production facility for the prototype. In parallel, the reflector design is nearing completion and several options are being explored for the telescope mount. The aim is to commission the 10-m prototype in the late spring of 2007 for assessment during the summer months.

Figure 5. Rendering of a 12-m CART antenna currently under development at HIA DRAO.

Octet, a Virtual Observatory tool developed by the Canadian Astronomy Data Centre (CADC)

by Daniel Durand, Patrick Dowler, David Schade, NRC-HIA

What is the Virtual Observatory

Astronomy, like most sciences, is facing a serious data avalanche opportunity. Breakthroughs in detectors, telescopes, instruments and computers are enabling the production of multiple terabytes of data and catalogues. Also, when combining data coming from multiple facilities, users can now access the sky in multiple band passes. Finally facilities are being developed and/or planned which will multiply the data rate by orders of magnitude.

CADC was a founding member in 2002 of an organization called the International Virtual Observatory Alliance (IVOA) whose goal is to define and implement the numerous pieces and protocols required to create the Virtual Observatory (VO). We are fully committed to creating leading-edge information technology services for research astronomers.

CADC hosts the largest astronomy data collection in the world at 160 terabytes. We are the first data centre to begin retooling our archive infrastructure to support VO data access and services. In addition we have spent 5 years working on advanced database applications for VO. Octet is the fourth generation or our VO query tools and is unique.

What about Octet

Octet is a new service provided by CADC to enable rich search and exploration of CADC data collections. The primary goal of this tool is to enable users to find sets of overlapped images in different wavelength bands and thus to assemble datasets appropriate for multi-wavelength survey work. The tool could also be used to browse a given data collection and to explore the parameter space of each collection.

With Octet you will be able to examine and associate data coming from the CADC collections (CFHT, HST, GEMINI, CGPS, IRIS and JCMT) as well as collections hosted at a number of external sites for which the CADC has collected and indexed the metadata in order to be able to perform sophisticated searches. Octet also performs cutout on images, retaining only the common area. It is important to mention that all datasets included in Octet are fully calibrated.

Octet is a uniquely powerful query tool. It has the capability of searching the entire sky for areas which have a specified set of multi-wavelength observations. It can also be used in a simple mode using queries by position, instrument, or other parameters. Constructing useful queries on multiple datasets is difficult because the user is normally not intimately familiar with all of the data collections. The result is that queries frequently return either no results or too many results. Octet effectively deals with this problem by allowing the user to examine distributions of various parameters that characterize the data (e.g., exposure time, wavelength coverage, observation date, etc.) so that the queries can quickly be focused on the most appropriate data. Simple examples of Octet queries are those where a user wants to find all CFHT Legacy Survey fields where u,i, and z-band data are available with exposure times greater than 1000 seconds. Another example would be to find all sky areas which have i-band observations from any of CADC's collections (e.g. HST, CFHT) and have Spitzer observations and have 850 micron SCUBA observations.

How to run Octet

Octet is implemented as a Java application and is started via the Java WebStart technology. A significant amount of memory has to be allocated to the Java applications when running Octet if you want to display the potentially large FITS file which could be present in your selected associations (like HST's ACS files).

Octet is started by first going to the CADC's VO web site:

http://www.cadc.hia.nrc.gc.ca/cvo/

and clicking on the Launch [Launch Octet] button.

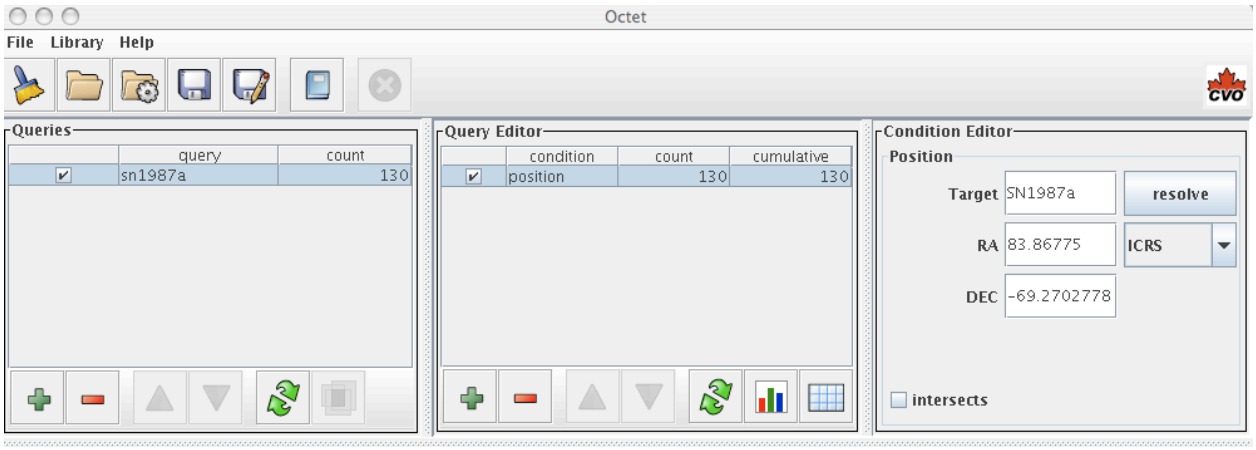

Figure 1: Octet in single query mode

While launching, you will be prompted to trust the two main applications, Octet and Aladin, to access your computer. Doing this allow these applications to be able to download, save and print data on your local computer.

Once launched, you will see two windows. The main Octet window and the Query Library [ ] which allows you to quickly specify bandpasses for the association search. Octet is a versatile tool and we will not be able to pass through all the functionalities in this article. So we will show you the basic capabilities using two examples. You are invited to try Octet and to please contact us if any problems occur. We believe that Octet is a radical new tool which could potentially help your science discovery procedures.

Example 1: Using Octet to find all images of SN1987A (simple science query)

In this mode, we are simply asking Octet to search for all observations of the famous SN1987A in its collections. In the Query panel, you click on add [ ] to define a new query for which the "position" property will be defined as SN1987A. A click on the Resolve button will get the coordinates of the object (Figure 1). The button will analyse the query by checking how many observations satisfy the conditions.

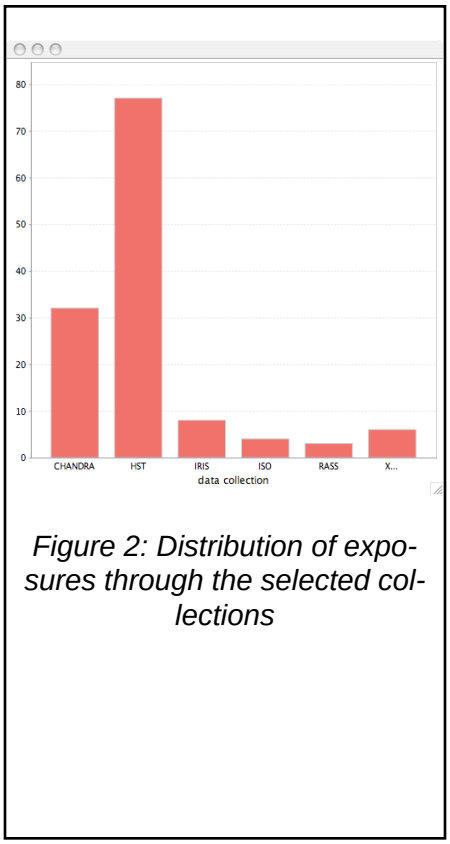

Figure 2: Distribution of exposures through the selected collections

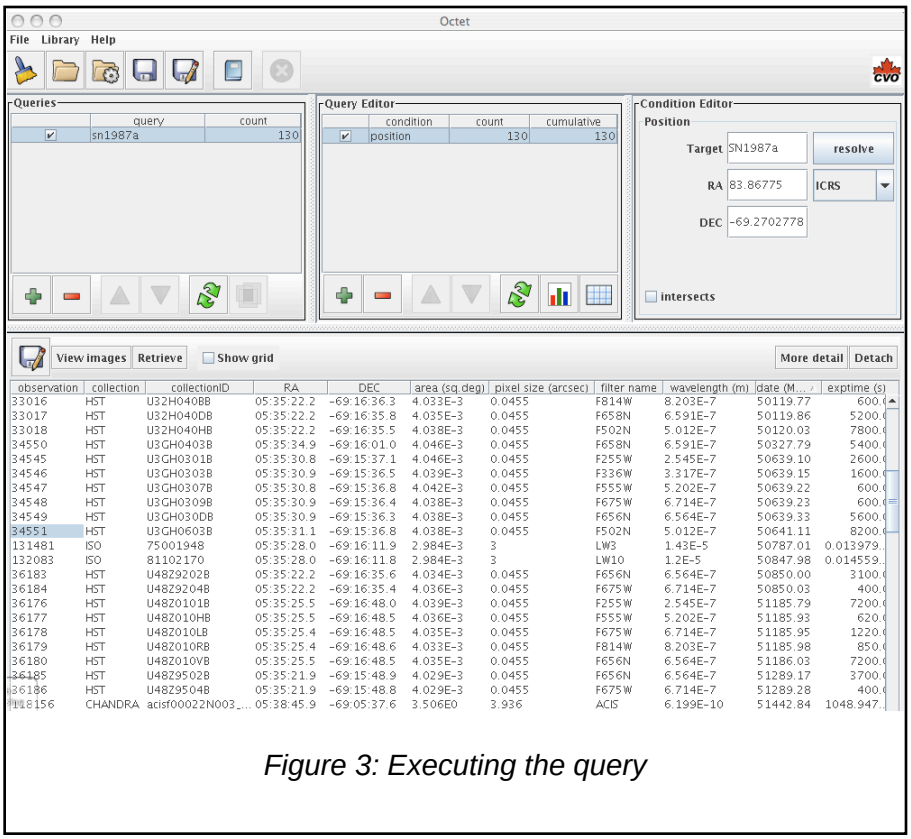

Figure 3: Executing the query

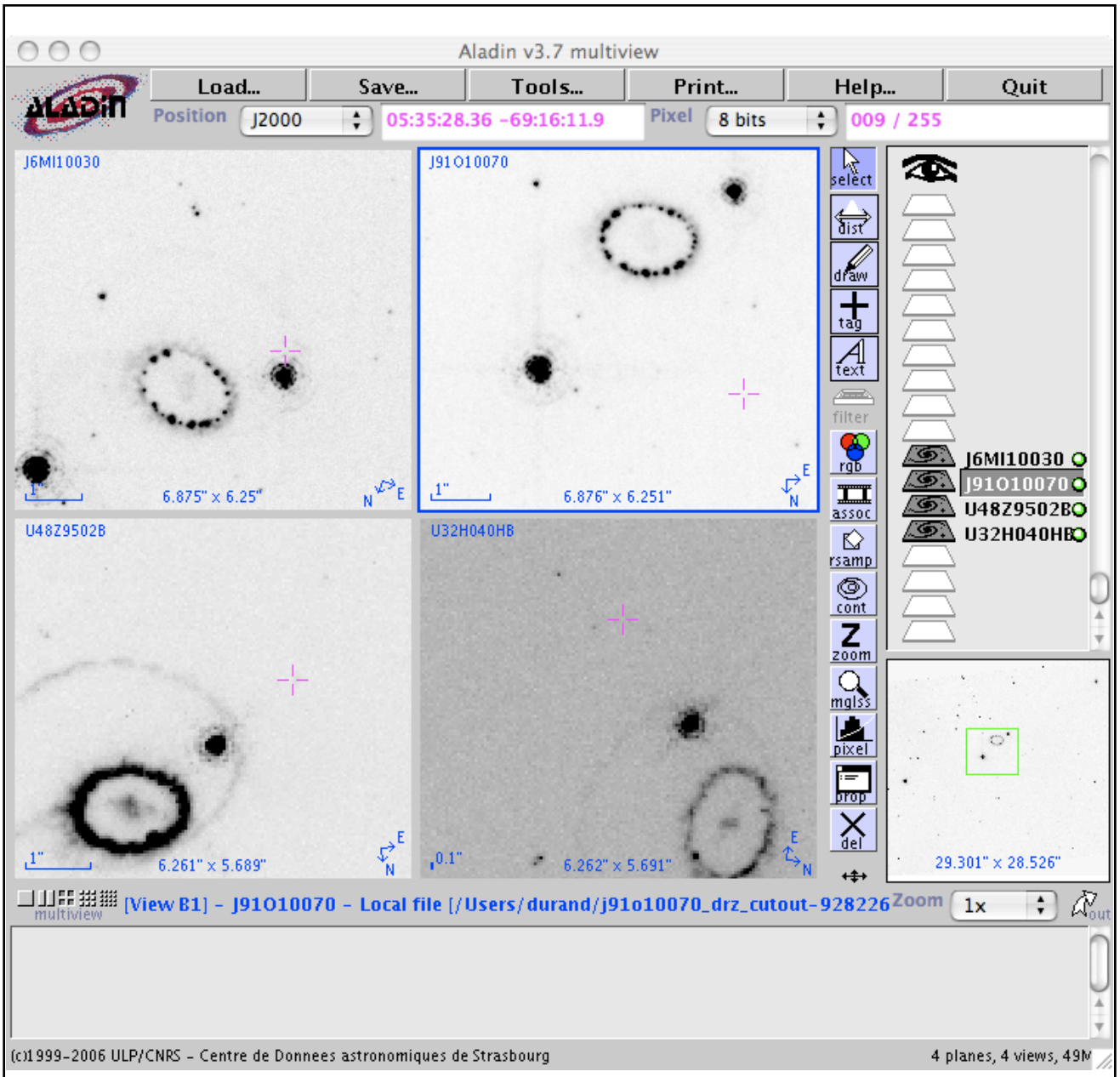

Figure 4: Display of multiple observations of SN1987A

Then a click on  will display a menu to let you get a distribution of any observables, in this case, the number of matched exposures per CADC collection (Figure 2). Finally, clicking on query [] will run the query and display the results. (Figure 3).

You have then the possibility to select, retrieve and display the resulting images. For the display, we are using the well known tool Aladin developed by the CDS in France. Switch Aladin into multi image mode allow you to get the image of SN1987A through multiple bandpasses and/or through time of observations (Figure 4).

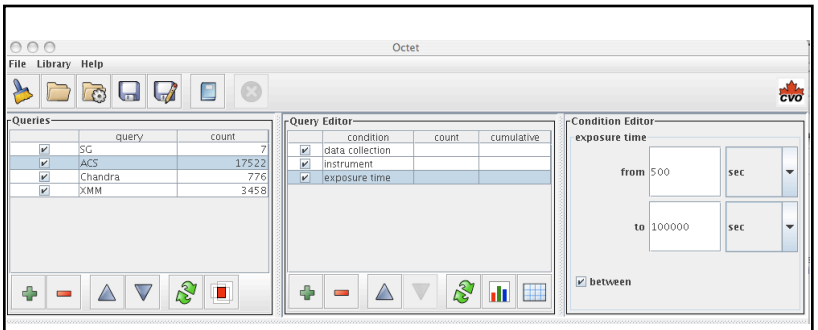

Figure 5: Setting up the Query (4 of them!)

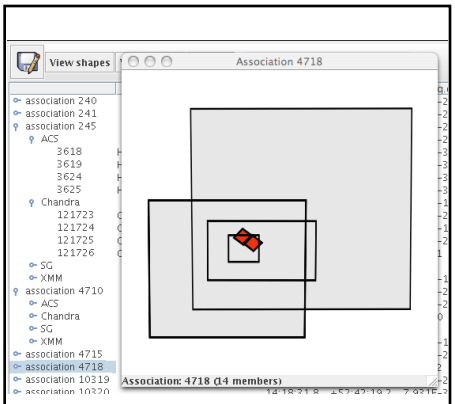

Figure 7: Association footprint

Example 2: Using Octet to find all observations having been observed by CFHT Legacy Survey deep fields, XMM, HST'S ACS and CHANDRA

First you have to "create" 4 different queries in the first panel. Those queries are quite generic and no parameters have been specified but a range of exposure time for the ACS observations. Using  , you could check the number of matching observations for each query. Then using the association button [] you trigger a search in the CADC metadata collection which will produce a list of area on the sky which have observations common to the selected missions.

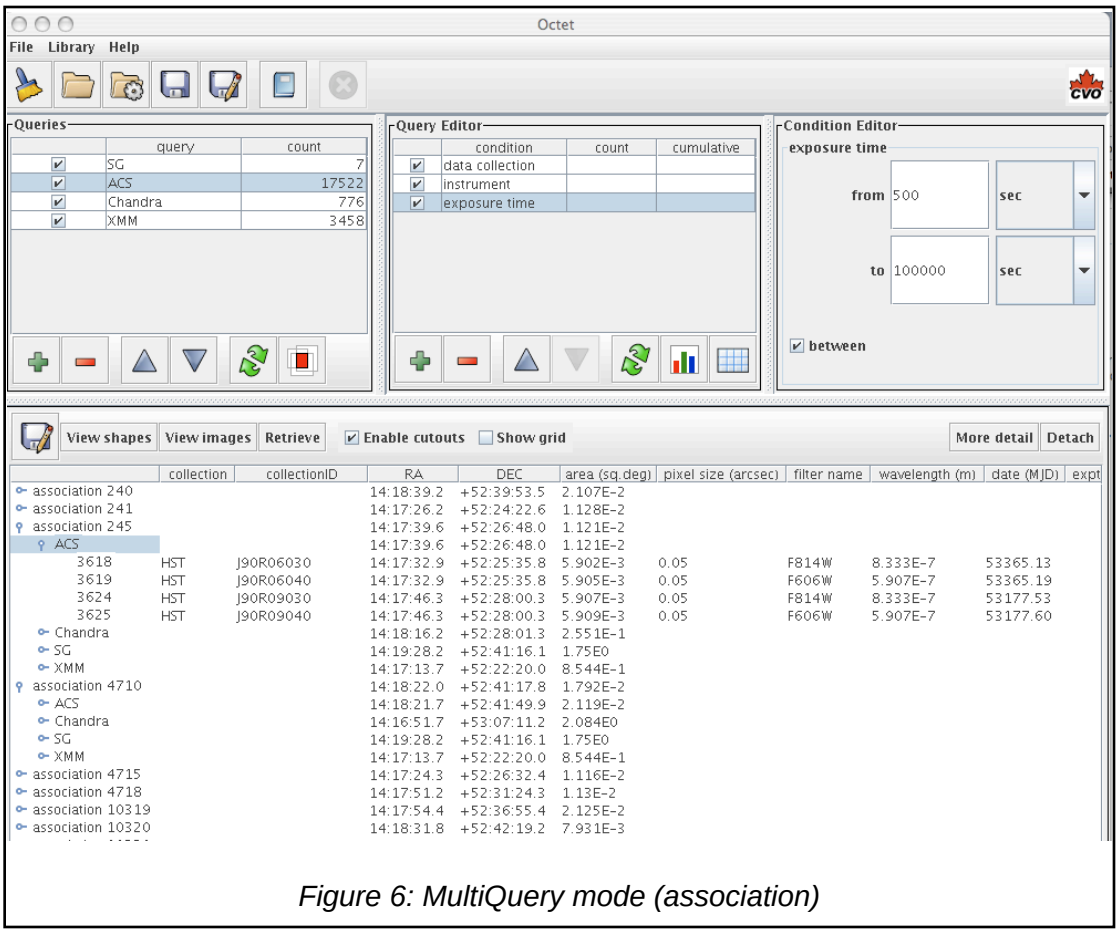

Figure 6: MultiQuery mode (association)

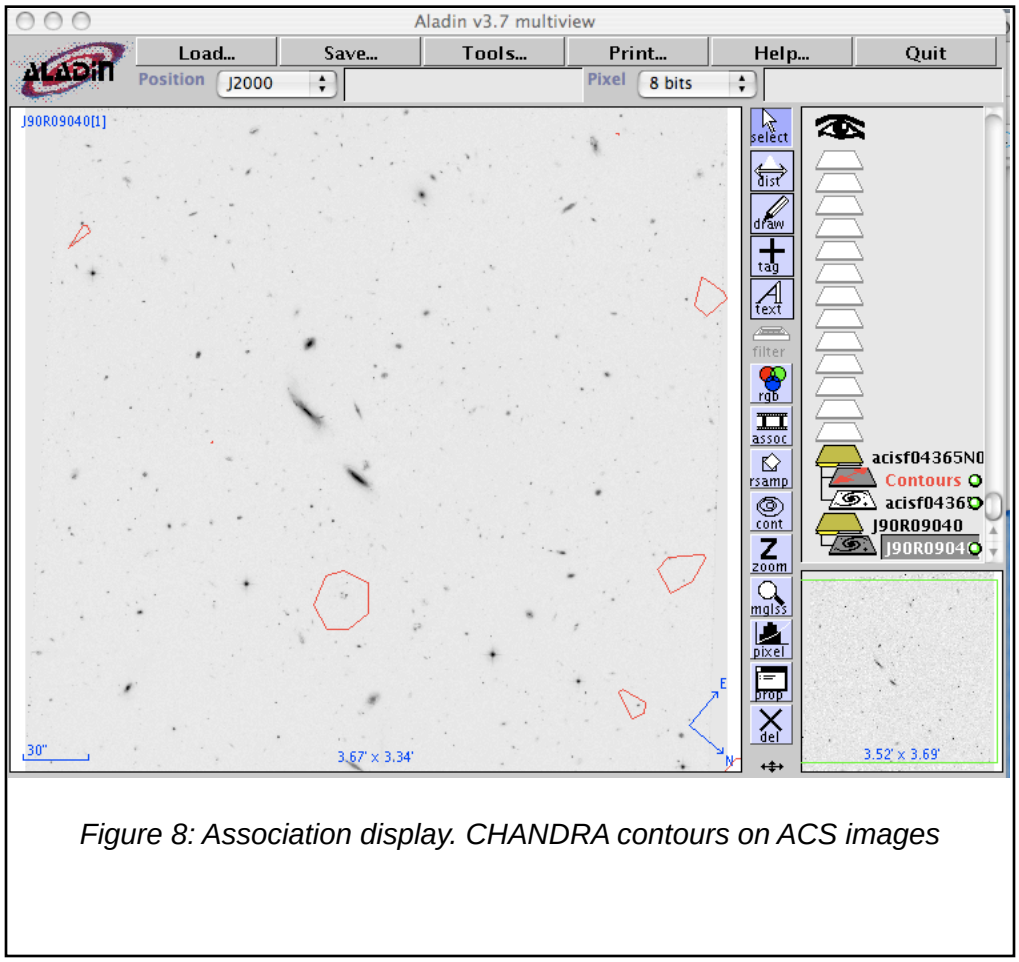

Figure 8: Association display. CHANDRA contours on ACS images

Then for each association, or section of the sky, you can visualize the footprint of each observation and, in red, the common area matching the criteria. (Figure 7)

Finally, each association could be visualized using Aladin and images could be saved on the your computer for further analysis. (Figure 8)

Future of Octet

Here we have explored only the elementary possibilities of Octet. Octet will continue to evolve. More VO compatible collections are constantly added to the list of accessible images making Octet a very powerfull tool. New functionalities will also be added in the very near future. Please send us any other collections or functionnalities you would like to see us implement in Octet.

For instance, we are working on a time based query interface which should allow you to specify the required time sampling as well as wavelength sampling and then to search the entire sky for datasets satisfying the constraints. The current content of Octet spans a time range of many years so there is the potential for interesting results in terms of data for variability, moving objects, proper motions, and other time-based phenomena.

Octet, un outil développé par le Centre Canadien de Données Astronomiques (CCDA) pour l'observatoire virtuel

par Daniel Durand, Patrick Dowler, David Schade, CNRC-IHA

Qu'est-ce que l'observatoire virtuel

L'astronomie, comme presque toutes les science, doit faire face à une avalanche de données. Les percés technologiques autour des détecteurs, télescopes, instruments et des ordinateurs ont permis l'acquisition et la production de plusieurs centaines de teraoctets de données et de catalogues. De plus, en combinant les résultats de plusieurs missions, les astronomes ont facilement accès a des images du ciel pour plusieurs bandes passantes. En plus, les nouvelles installations qui sont en construction ou qui sont prévues au cours des 20 prochaines années devraient multiplier par au moins dix la production de données.

Le CCDA a été un membre fondateur en 2002 d'une association appelé "International Virtual Observatory Alliance (IVOA)". Le but premier de cette organisation est de définir et d'implémenter les nombreux modules et protocoles requis au fonctionnement d'un Observatoire Virtuel (VO). Le CCDA est pleinement impliqué a créer des services de tout premier ordre pour supporter la recherche en astronomie via le VO.

La collection du CCDA, la plus vaste au monde, comporte au moment d'écrire cet article plus de 160 teraoctets. Nous sommes présentement le premier centre d'archivage de données astronomiques à complètement changer son infrastructure afin de supporter pleinement l'observatoire virtuel. Depuis plus de 5 ans, le CCDA travaille afin de produire des outils VO adéquats. Octet est notre dernière création.

Qu'est-ce qu'Octet?

Octet est un nouveau service offert par le CCDA qui permet à un utilisateur d'explorer la riche collection du CCDA. Le but premier d'Octet est de rechercher les images coïncidentes sur le ciel qui obéissent à des critères de sélection précis tel que demandés par l'utilisateur pour éventuellement assembler des images provenant de diverses missions. L'outil permet également l'exploration des paramètres temporels, spatiaux et d'énergie de chaque collection du CCDA.

Avec Octet, l'usager peut explorer et associer les données de télescopes provenant des collections propre au CDDA (TCFH, HST, GEMINI, CGPS, IRIS and TJCM) ainsi que

d'autres collections pour lesquelles le CDDA a incorporé leurs meta-données pour qu'ils soient disponibles via Octet (ex CHANDRA, XMM). OCTET permet également l'extraction de sous images qui correspondent aux zones communes des associations provenant de diverses collections.

Octet est un outil unique en son genre. Grâce à Octet, il est possible de chercher le ciel en entier pour chercher les zones où plusieurs observations provenant de fenêtres spectrales différentes sont coïncidentes. Il peut également être utilisé en mode simple en spécifiant positions, instruments ou autres paramètres. Construire un système de recherche oeuvrant en plusieurs longueurs d'onde est difficile, car souvent l'usager n'est pas familier avec le vocabulaire propre à chaque bande spectrale. Les résultats de ces requêtes sont souvent nulles, ou trop vastes. Pour remédier à ce problème, Octet permet d'explorer les différents paramètres visuellement, facilitant grandement la construction d'une requête adéquate. Un simple usage d'Octet consiste à chercher les observations du CFHTLS où les bandes u, i et z ont été observées avec un temps d'intégration de plus de 1000 secondes. Un autre exemple: trouver les zones de ciel où il existe une image en bande i (soit CFHT ou HST), une observation Spitzer, et une observation SCUBA à 850 microns!.

Comment utiliser Octet

Octet a été implémenté comme une application Java qui peut être démarrée via la technologie WebStart et votre navigateur. L'embûche principale au démarrage et à l'utilisation d'Octet est la quantité de mémoire assignée à Java, surtout si de larges images devront être affichées pendant la session d'Octet.

Octet démarre en pointant son navigateur à l'adresse URL suivante:

http://www.cadc.hia.nrc.gc.ca/cvo/

et en appuyant sur le bouton de démarrage [Launch Octet].

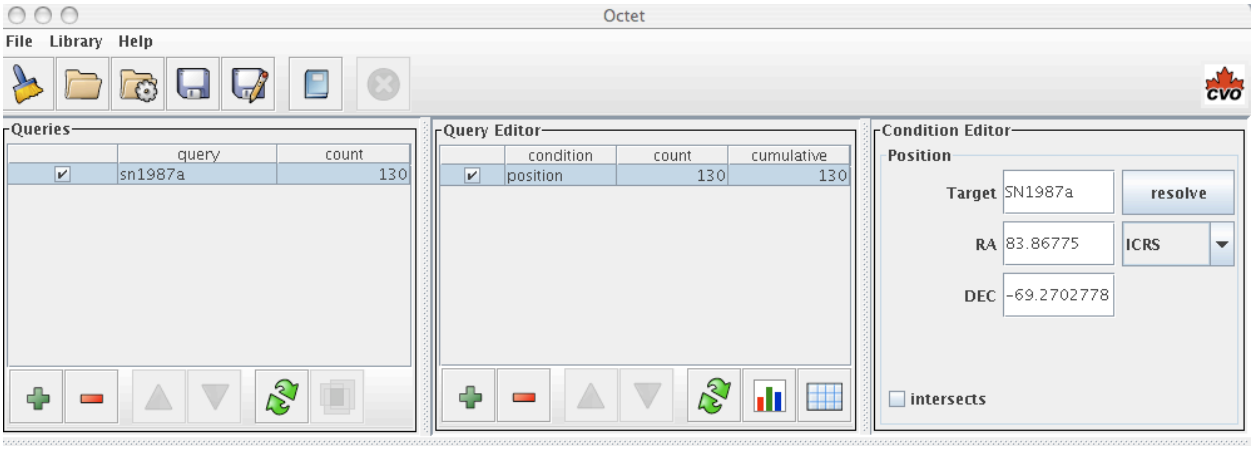

Figure 1: OCTET dans le mode simple

Au démarrage, Octet vous demandera d'accepter l'usage d'Aladin et Octet pour votre ordinateur. Ceci est requis si vous voulez sauvegarder ou imprimer des images.

Après le démarrage, vous aurez devant vous deux fenêtres. La fenêtre principale d'Octet et une fenêtre qui permet d'utiliser certaines conditions pré-définies [ ]. Octet est un outil assez complexe et nous ne serons pas capable d'expliquer toutes ses possibilités dans le cadre de cet article. C'est pourquoi nous avons choisi de vous présenter Octet via deux exemples simples. Ce sera à vous par la suite d'explorer Octet. Vous êtres également invités à nous faire parvenir vos commentaires et suggestions suite à votre expérience avec Octet. Nous croyons qu'Octet va vous permettre d'explorer de nouvelles facettes pour la réalisation de vos projets scientifiques.

Example 1: Utiliser Octet pour trouver toutes les images de SN1987A

Pour répondre à cette question, nous utilisons Octet dans un mode simple. Dans le panneau intitulé "Queries", cliquez sur "addition" [ ] pour définir une nouvelle recherche. Définissez cette recherche en utilisant le paramètre "position" en cliquant sur le du panneau "Query Editor". Puis, à l'intérieur du "Condition Editor", spécifier SN1987A et cliquez sur "Resolve" pour trouver les coordonnées précises de SN1987A (Figure 1).

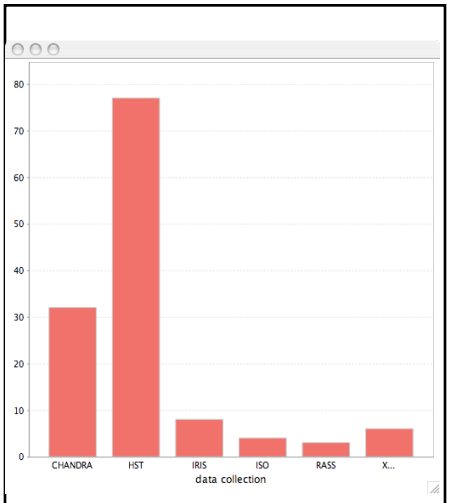

Figure 2: Distribution des observations pour les collections sélectionnées

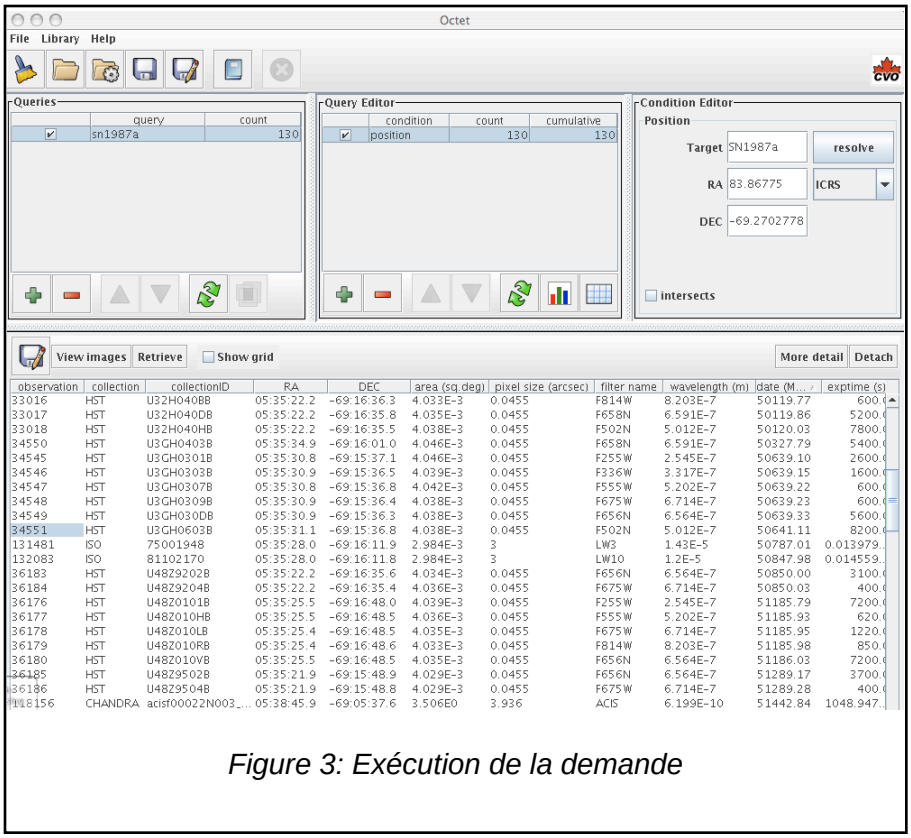

Figure 3: Exécution de la demande

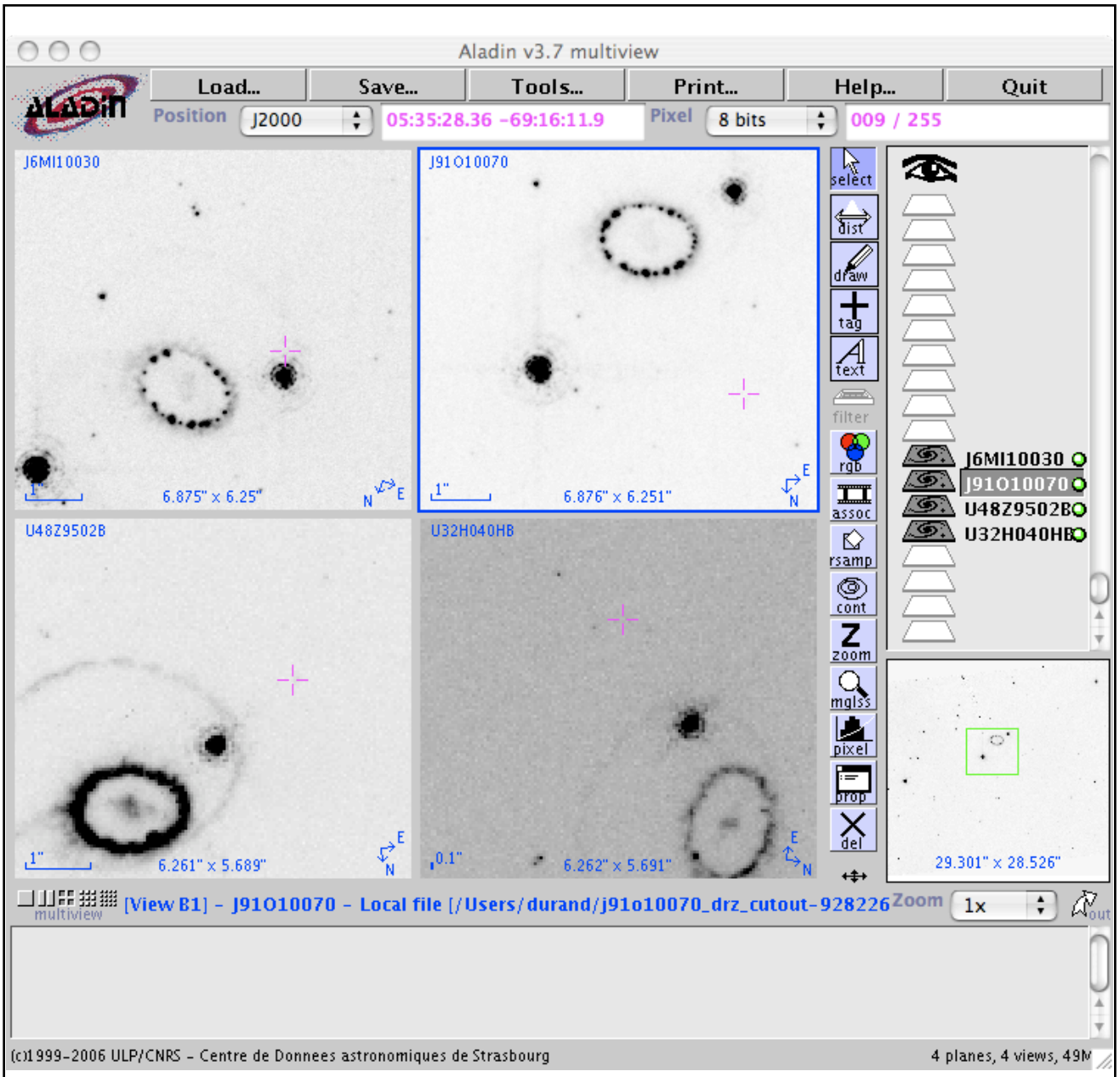

Figure 4: Affichage de plusieurs observations de SN1987A

L'usage du bouton d'exploration [ ] permet d'obtenir le nombre d'observations qui répondent aux critères choisis. Puis en appuyant sur histogramme [ ] un menu qui nous permet d'obtenir la distribution de chaque paramètres, pour cette exemple, on obtient le nombre d'observations qui répondent aux critères pour chaque collection (Figure 2). Finalement, exécutez la recherche en appuyant sur recherche [ ] , vous obtiendrez alors les résultats de la recherche (Figure 3).

L'usager peut alors sauver localement les images trouvées et/ou les afficher. Pour l'affichage, Octet utilise Aladin développé par le CDS en France. Chaque image peut être transmise à Aladin. En utilisant Aladin en mode multi-image, on peut alors afficher SN1987A à travers plusieurs bandes spectrales ou encore, pour plusieurs dates d'observation (Figure 4).

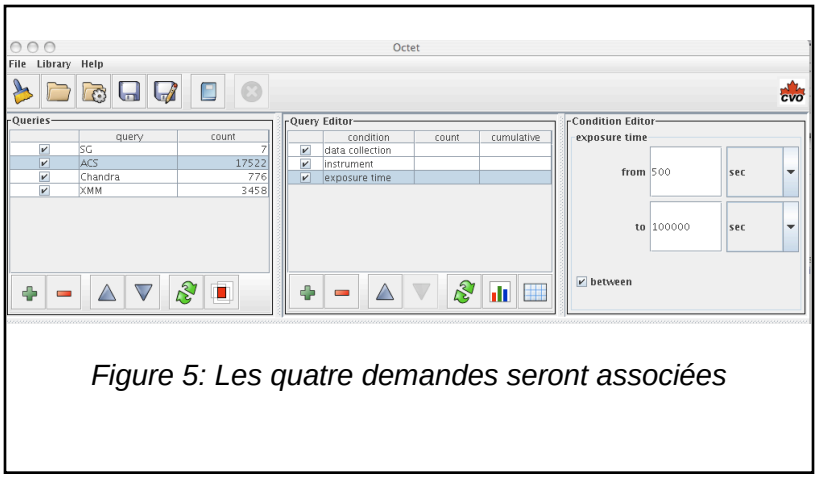

Figure 5: Les quatre demandes seront associées

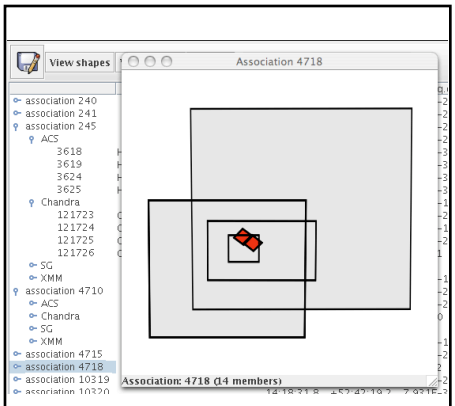

Figure 7: Empreinte

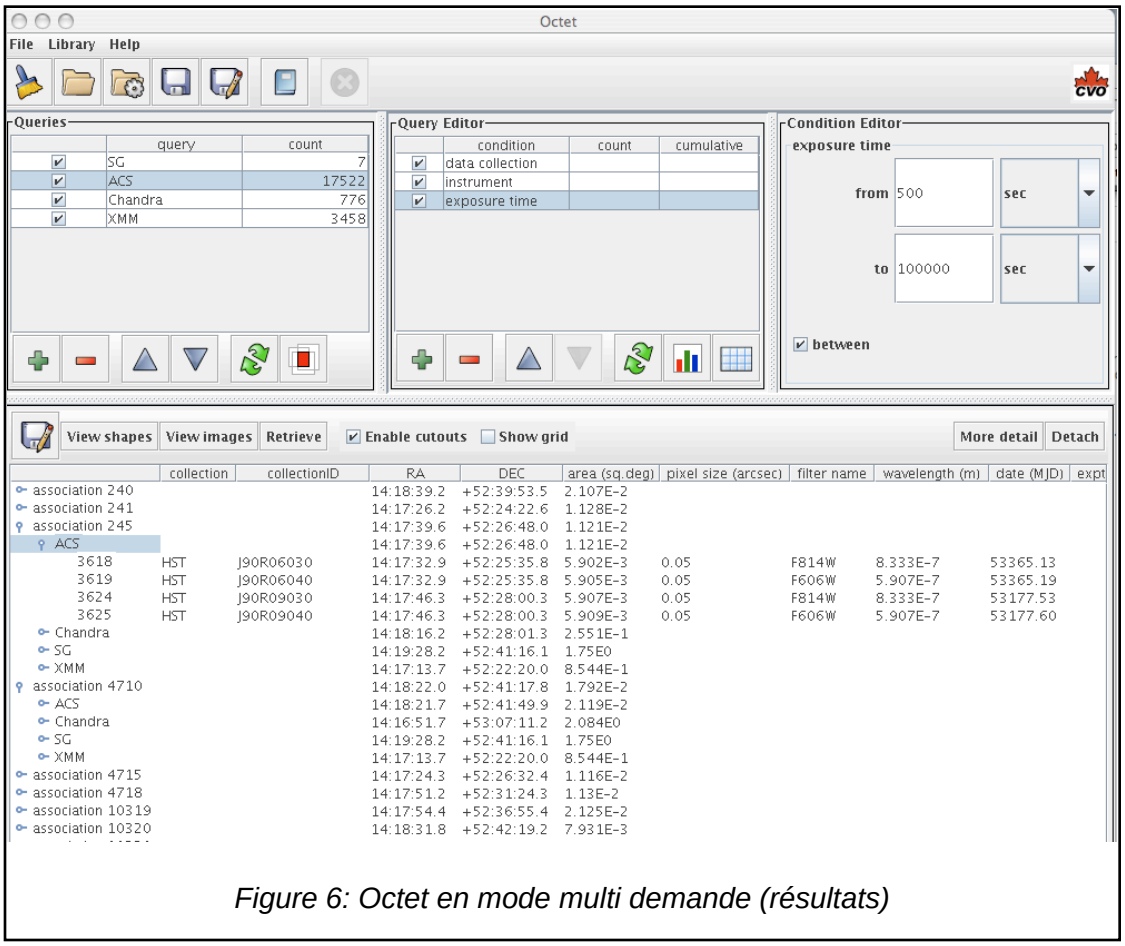

Figure 6: Octet en mode multi demande (résultats)

Example 2: Utiisation d'Octet pour trouver les observations communes avec le CFHT Legacy Champ Profond, XMM, CHANDRA, and ACS

Premièrement, il faut définir 4 requêtes différentes (voir la procédure ci haut). Ces quatre requêtes sont assez générales et seule celle qui concerne l'ACS doit être raffiné pour utiliser un intervalle de temps d'exposition précis. En utilisant  , on peut obtenir le nombre d'observations pour chacune des sous-requêtes. Puis, en utilisant le bouton

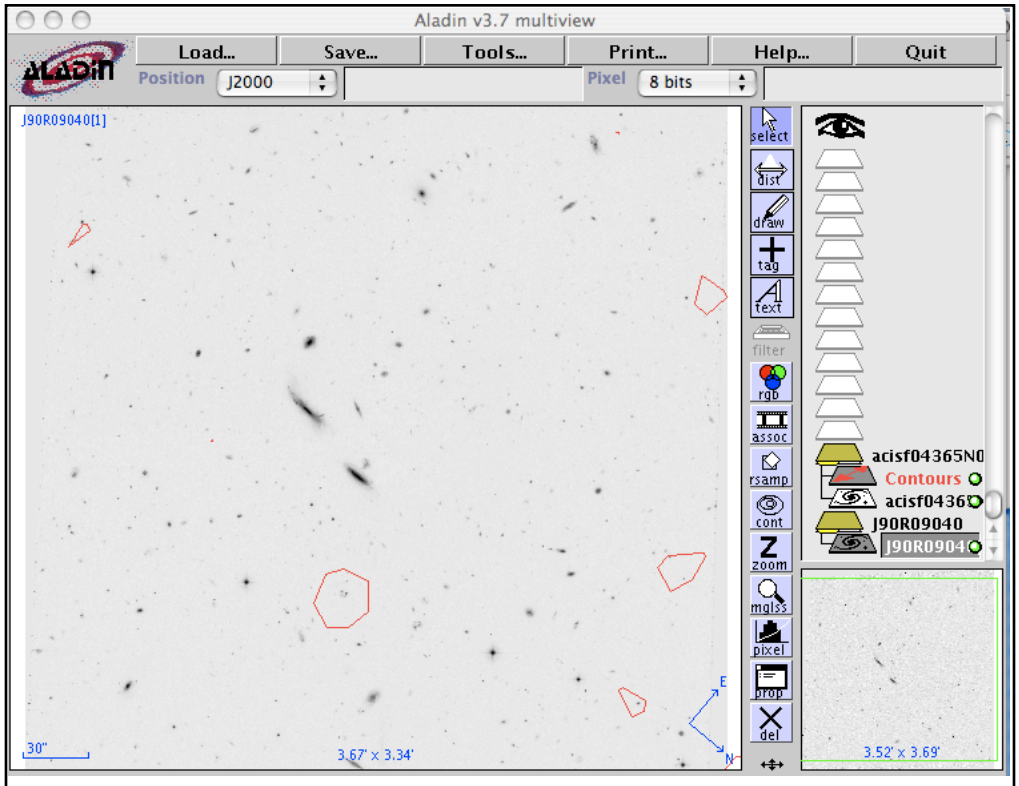

Figure 8: Affichage d'une association. Contours d'une image CHANDRA superposés à une image ACS

recherche associations [] Octet va recherche les collections sélectionnées pour trouver les zones communes.

Puis, pour chaque association, ou section de ciel, vous pouvez visualiser l'empreinte de chacune des observations en plus d'obtenir, en rouge, la zone commune (Figure 7).

Finalement, chaque association peut-être affichée via Aladin et les images peuvent être sauvegardées sur votre ordinateur soit complètement ou soit la zone commune (Figure 8).

Future d'Octet

Nous venons d'explorer que deux modes possibles d'Octet. En plus Octet va continuer à évoluer. D'autres collections sont continuellement ajouter à Octet. Egalement d'autres fonctions seront développées et ajoutées à Octet très prochainement. N'hésitez pas à nous faire parvenir vos commentaires suite à l'utilisation d'Octet.

Par exemple, nous travaillons à l'élaboration d'une extension à Octet qui permettra de sélectionner l'échantillonnage temporel et spectral et chercher les collections d'Octet pour les observations qui obéiront à ces nouveaux paramètres de recherche. Les observations contenues dans Octet s'étendent présentement sur plusieurs années, il serait donc possible, et scientifiquement très intéressant de pouvoir définir une requête afin de rechercher des objets variables, des déplacements, et autres phénomènes temporels qui sont très souvent ignorés.

Jayanne English Wins Prestigious Imaging Award

We are delighted to report that Jayanne English, Department of Physics and Astronomy, University of Manitoba, and Chair of the CASCA Education and Outreach Committee, is the 2006 winner of the National Radio Astronomy Observatory (NRAO) Radio Astronomy Image Contest. She and her collaborators, Jeroen Stil and Russ Taylor, University of Calgary, will share the grand prize of $1000 US.

According to the official press release, the image is of "a majestic gas shall revealed by the VLA"; it goes by the prosaic name of GS 62.1+0.2-18, and is an enormous, nearly empty bubble, blown into the dusty gas disc of the Milky Way galaxy. Jayanne is an expert on these remarkable features of our galaxy. This particular image was made using data collected as part of the VLA Galactic Plane Survey, led by Russ Taylor. This survey is part of an even larger Galactic Plane Survey, in which Canadians have played a major leadership role. So this image, and this award, are a tribute both to Jayanne and to Canadian astronomy in general.

The award winning image of GS 62.1+0.2-18! (click on image for larger view)

Jayanne has a unique background that includes education and experience in art and design, as well as astronomy. She worked on the Hubble Heritage Project during her postdoctoral years. We are fortunate that she is chairing the CASCA Education and Outreach Committee, because the CASCA E&O initiative now includes the development of a website AstronomyCanada.ca which will produce high-quality images, graphics, and information about Canadian astronomy for the media, and for all of us who engage in education and outreach.

For more information, see: http://www.nrao.edu/pr/2006/imageprize/

Congratulations, Jayanne!

John R. Percy
University of Toronto

A Memorial Tribute

Donald Alexander MacRae B.A., A.M., Ph.D., F.R.S.C. (1916-2006)

With the passing of Donald Alexander MacRae on December 6, 2006 at age 90, the astronomy community lost a visionary scientist and a pillar of the Canadian astronomy community. Under his leadership during the 1960's and 1970's the Department of Astronomy (now Astronomy and Astrophysics) of the University of Toronto (UofT) grew into a diversified and internationally recognized institution. Graduates of the department and their scientific descendants now constitute nearly half of all members of the Canadian Astronomical Society.

Don MacRae was born in Halifax, Nova Scotia on February 19, 1916. After the family moved to Toronto, where he received most of his early education, he obtained his undergraduate degree in Mathematics and Physics in 1937 from the UofT. He obtained the degree of A.M. in 1940 and Ph.D. in 1943 from Harvard University under the mentorship of Bart Bok in the field of galactic structure. During his early career he worked briefly at the University of Pennsylvania, Cornell University, and at Carbide and

Chemical Corporation at Oak Ridge, Tennessee. For Don the latter work was a brief and somewhat uneasy association with the Manhattan Project. In 1946, he obtained a position at Case Institute of Technology (now Case Western Reserve University), where he worked until 1953. In 1953, he accepted a position at the University of Toronto, replacing Ralph Williamson, who had earlier introduced Don to the emerging field of radio astronomy while they both were at Cornell.

Don's primary research field was stellar spectroscopy, but his interests were much broader than this, and he possessed an abiding ability to interest students and faculty in new and emerging ideas. In the early 1960's he developed a strong interest in the nature and origin of the lunar surface, and discussed these extensively with colleagues. Many of his ideas on this subject were later confirmed by the lunar exploration program. Don's continuing interest in radio astronomy led him to introduce this subject area into the Toronto graduate research and teaching curriculum. In collaboration with the Department of Electrical Engineering, he established a radio astronomy observatory on the grounds of the David Dunlap Observatory (DDO) in 1956. This was at a time when few astronomers took this subject seriously. The DDO work led to the precise determination of the absolute flux density of Cas A at 320 MHz, a radiometric standard as important today as it was when it was reported in 1963. As this work was completed, radio frequency interference was becoming a severe problem, and plans were underway to build a complement of antennas at the University of Toronto site of the National Research Council's (NRC's) new Algonquin Radio Observatory in Algonquin Park. Radio observations were continued there for a short period, but around 1965, interest became focused on the capabilities of the newly constructed 46m telescope, Canada's new and powerful national observing facility. The radio astronomy program that Don established was an early stimulus for the first successful experiment in Very Long Baseline Interferometry in 1967, a collaboration among the UofT, Queen's University and NRC.

As a teacher, Don was highly regarded by his students, whom he engaged with his characteristic wit and frequent anecdotes. His lectures were always well prepared and organized, and endowed with an underlying belief that the ideas and principles of physics were most easily understood by applying them first to the stars. He was as innovative in teaching as he was in promoting new research directions. He is regarded as the first professor at Toronto to teach computer programming at the university, recognizing early that students would need such skills in their scientific careers. Programming became an integral part of astronomy laboratory work long before Computer Science became a recognized discipline at the university. Similarly, he was a strong advocate for public outreach, and participated enthusiastically in the Saturday evening tours at the DDO. Many of us remember the Oscar-nominated short film "Universe" produced in 1960 by the National Film Board, featuring the DDO and Don

MacRae as the astronomer working with the observatory's 74" telescope. Realizing that a major planetarium was needed in Toronto to serve both the public and the university, he cooperated with colleague Victor Meen at the Royal Ontario Museum (ROM) to attract financial support for the McLaughlin Planetarium, which opened at the ROM in October 1968. In honour of his strong record in education, the UofT established an undergraduate scholarship in his name in 2003 to reward promising undergraduates in the astronomy program.

In 1965, Don became Head of the department and Director of the DDO, and continued in these positions for 13 years. During this period, he presided over a major expansion of the Department which made it the major centre of astronomical activity in Canada. This expansion was accompanied by a new diversification into the areas of radio astronomy and theoretical astrophysics, which together came to occupy about 50% of departmental activity. New telescopes were acquired for teaching and research, including a 24-inch at DDO for photometry, and most significantly, a 24-inch telescope at Las Campanas, Chile, site of the Carnegie Southern Observatory. The new southern observatory, established in 1971 as the University of Toronto Southern Observatory, became the first Canadian offshore astronomy facility. The clear weather and excellent seeing conditions at Las Campanas attracted many graduate students to study astronomy at the UofT. It was also used by many astronomers from other institutions. As part of the arrangement with Chile for the location of the observatory in Chile, many Chilean graduate students were educated as astronomers at Toronto.

Don MacRae was an active participant in the establishment of national observing facilities for all Canadian astronomers. He supported the establishment the Algonquin Radio Observatory in the 1960's to serve the growing community in the emerging field of radio astronomy. He was a tireless advocate for the acquisition by Canada of a significant share in a major optical observatory at the best possible observing site in the world. He participated in the planning and development of the Canada-France-Hawaii-Telescope (CFHT) on Mauna Kea, Hawaii in the 1970's, and served as one of four Canadian astronomers on the Board of the CFHT Corporation from 1973 to 1979. He was also an early advocate for university participation in space astronomy. During the 1970's he was elected to the Board of Trustees of the Universities Space Research Association (USRA), and served as Board Chair in 1973. USRA was a U.S. organization dedicated to promote cooperation between NASA and North American universities.

Although Don retired in 1982 and was appointed Professor Emeritus in the department, he continued his interest in departmental activity for many years after. During the 45 years I knew Don, both as his graduate student 1961-66, and later as one of his colleagues, I shared with his friends and associates an enduring respect for his wisdom,

generosity, sense of humour, powers of observation and rigorous attention to accuracy and detail. He maintained an abiding ambition to create a leading department and to help in establishing a world renowned astronomical community in Canada. His legacy is that he succeeded in both areas.

This memorial tribute was prepared with assistance from Drs. Thomas Clarke, William Clarke, Christine Clement, Peter Martin and René Racine.

E.R. Seaquist
Professor Emeritus
Department of Astronomy and Astrophysics
University of Toronto

News

An Alma Update by Chris Wilson

Events at NRC's HIA (Autumn 2006) / Du neuf à l'IHA du CNRC (Automne 2006) by Jacques P. Vallée

ALMA Update

1 Recent news

1.1 Construction Progress

At its November meeting the Board approved the 2007 construction budget of 67.4M Euros plus US$96.8M for the bilateral project (the East Asian construction contributions are largely made in-kind (as are Canada's), earning value within the partnership that results in access to observing time). 2007 is projected to be the peak spending year for ALMA construction, although 2006 and 2008 are nearly as large.

Work on the foundation for the Operations Support Facility (OSF) Technical Building is underway at the 9600 foot level. When completed in 2008, this building will be the main center for ALMA operations. Construction of the Assembly, Integration, and Verification building at the OSF site was completed on schedule November 7.

At the high site, construction work to finish the interior of the building at the Array Operations Site (AOS) is progressing well. The building is expected to be fully enclosed and powered with a temporary generator by late January 2007 and will also have a temporary communications link to the OSF. The design and engineering of the antenna layout, road system, power, and fiber optic cable has been completed out to the four km configuration. Design work on the more extended arrays is ongoing.

Testing work is proceeding well at the ALMA Test Facility (ATF) at the VLA site in New Mexico. A first round of holography testing was completed this fall; more holography is scheduled for the week before Christmas. The central Local Oscillator (LO) has been relocated from Socorro to the VLA building and the master laser has been successfully powered up. The prototype correlator is being moved to the ATF and we expect to get first fringes using the two prototype antennas early in the new year.

At the North American Front End Integration Center (FEIC) in Charlottesville, Virginia, the first beam map was made using a production cryostat and a Band 6 (1.3 mm) receiver. The first cartridges for Band 3 (3 mm, HIA), Band 6 (1.3 mm, NRAO) and Band 7 (0.8 mm, IRAM) have all been installed in the first front end. All receiver bands are healthy and integration of the front end subsystem is continuing. I discuss more detailed progress on Band 3 later in this report.

Some key personnel have recently been hired for ALMA. Lars-Å ke Nyman has been hired as the new Head of Science Operations and comes to ALMA with extensive Chilean operations experience from SEST and APEX. Russell Smeback has been recruited as the new Head of Administration. Interviews for the last open position in the Joint ALMA Office, the ALMA Project Scientist, took place during the Madrid science meeting in November.

1.2 ALMA Operations

Operations staff must be hired and trained during the construction, assembly, integration, and verification phase, so that they will be ready to begin operations, both in Chile and in the ALMA Regional Centres, as antennae are released for commissioning and operations. Accordingly, operations ramp-up must begin in earnest in 2007, for which the Board approved a budget totalling US$5.1M. The 2007 North American share is US$1.9M, of which Canada is responsible for 7.25%; these figures include the early costs of the ALMA Regional Centers. East Asia is fully integrated into the operations contributions. The importance cannot be over emphasized of securing the second round of LRP funding for completing our construction obligations and meeting our new operations obligations.

Doug Johnstone, Lewis Knee and Chris Wilson provided detailed comments regarding Version B of the Operations Plan for Jim Hesser's input to the Operations Working Group. This detailed plan links operations staffing to individual construction milestones. The Board is organizing an independent review of the Operations Plan by an international panel for late February. In parallel, the NSF will have AUI/NRAO's proposal for the U.S. share of ALMA operations reviewed by a panel whose membership will partially overlap with the Board's panel. Successful outcomes are much to be desired by Canadians looking forward to using ALMA.

1.3 ALMA Science Meetings

The second world-wide meeting on "Science with the Atacama Large Millimeter Array" was held in Madrid, Spain, on 13-16 November 2006. With approximately 300 attendees, the conference covered a wide range of topics, including the main scientific drivers of ALMA: the formation and evolution of galaxies, the physics and chemistry of the interstellar medium, and the processes of star and planet formation. The web page for the conference now contains many of the invited and contributed oral talks, as well as some of the posters and is available at

http://www.oan.es/alma2006/

Figure 1: Canadian attendees at the ALMA meeting in Madrid, Spain. Picture courtesy Jim Hesser.

NRAO is planning a science workshop on "Transformational Science with ALMA: Through Disks to Stars and Planets" to be held in Charlottesville, Virginia June 22-24, 2007. This workshop will likely be limited to about 60 people so I encourage anyone who is interested visit the web page at

http://www.cv.nrao.edu/naasc/disk07/

2 ALMA Science Advisory Committee

The ASAC met September 16-17, 2006 in Florence, Italy. The ASAC had three charges for the meeting: to review the revised Commissioning and Science Verification Plan for ALMA; to review the revised Calibration Plan for ALMA; and to review the existing work on developing complete descriptions of the ALMA observing modes (e.g. software, hardware etc.) and make recommendations as to their relative priority. The ASAC also heard an update on progress with

scientific software for ALMA (the observing tool, the pipeline, the offline data reduction system, and the archive). I summarize the main recommendations from the report below. The full report is available at

http://www.alma.nrao.edu/committees/ASAC/asacreport_2006sept.pdf

The ASAC supported the proposal to extend the schedule for Commissioning and Science Verification (CSV) and the consequent later start for "Early Science" with ALMA. The committee felt that starting formal "Early Science" in 2010 was acceptable given the time needed to commission the array, the plan for community participation in ALMA Science Verification projects, and the more powerful array that would be available by 2010 (at least 15 antennas and 4 receiver bands). The ASAC highlighted the need for a diligent and continuous effort to identify and recruit the best staff for the CSV team and to identify incentives to attract and retain such staff. The ASAC also recommended that ALMA consider creating a sabbatical visitor program to assist the Project Scientist to continue commissioning once Early Science begins and the array grows beyond 15 antennas.

Individual ASAC members reviewed each of the components of the Calibration Plan and provided detailed feedback to the team. Regarding observing modes, the ASAC recommended that the Project Scientist and the Science IPT should develop a more detailed list of observing modes. The ASAC would like to review these modes once the work is more advanced. Regarding science software, the ASAC recommended strongly that the release schedule for CASA (formerly known as AIPS++) be constantly scrutinized to ensure it meets the requirements of ALMA for early community testing and Early Science observations with ALMA. The ASAC also recommended that external users (in addition to NRAO users) be involved in CASA beta testing, with the goal of having the software available to a broad community before the start of Early Science.

In other ASAC news, Chris Wilson has ended her second term on the ASAC. The new Canadian ASAC member is Doug Johnstone from HIA. Chris will continue as Canadian ALMA project scientist and to be involved in ALMA software development as well as Canadian and North American community issues.

3 ALMA Developments in Canada

3.1 Canadian ALMA Science Steering Committee

The Canadian ALMA Science Steering Committee (CASSC) met Sept 10-11, 2006 at the Herzberg Institute of Astrophysics in Victoria. Within Canada, the main area of concern continues to be the (now urgent) need to obtain the second half of the LRP funding via the Mid-Term Review process. The money allocated for the first five years of the Long Range Plan will run out in 2007. In addition, money is needed for early ALMA operations; this money is both required by the international ALMA project and critical to ensure that high quality scientific support for

Canadians will be available during Early Science in 2010. ALMA cannot afford to be taken for granted or viewed as a "done deal"; we have both construction and operations commitments that need additional funding if they are to be met.

The committee also felt that the current focus of the ALMA project on operations issues means that negotiations with NSF/NRAO for Canadian contributions to operations must get underway very soon. The items that have been identified as possible operations contributions for Canada (Band 3 maintenance; scientific support; science archive development; software development) are all sensible options to explore. It is a high priority to have Canadian support astronomers. They should be hired or identified early so that they will be ready to support the community during science verification and early science.

The committee felt that the Band 3 construction work is going very well. It is very good to see that the receivers are meeting (and in many cases exceeding) the strict ALMA specifications. It is also good to hear that the documentation (statement of work, interface control documents, etc.) is close to completion. The work that the team has done automating key aspects of the testing process should pay off as they move into full production. The hybrid plan for production that was presented (with some steps being done in industry and some done in-house at HIA) seems like a reasonable plan.

The committee also had an extensive discussion of the three charges that had been sent by the ALMA Board to the ALMA Science Advisory Committee, in particular the draft Commissioning and Science Verification Plan. The committee consensus was that starting formal "Early Science" in 2010 was acceptable given the need to commission the array, the plan for community participation in ALMA Science Verification projects, and the more powerful array that would be available by 2010 (at least 15 antennas and 4 receiver bands). In considering the charge on observing modes, the committee had an extensive discussion of the single dish observing modes for ALMA. There will be some effort to feed back the Canadian experience with continuum observing modes on the JCMT into the ALMA planning in this area.

Finally, the committee had a number of suggestions for improving outreach on ALMA issues to the Canadian astronomical community. The CASCA email exploder should be used more to distribute information on timely ALMA issues and opportunities. One such example is the opportunity to participate in the update to the Design Reference Science Plan. The Canadian ALMA web page should be moved to McMaster University under the control of the project scientist and the information and links there updated and consolidated. The recent graduate student workshop in Victoria was a big success that should be repeated in 2008 or 2009 as we get closer to Early Science and to reach a new generation of students, postdocs (and faculty). The committee also discussed the possibility of holding a focused ALMA science workshop somewhere in Canada, similar to the ones that have been held and are being planned in Europe and at NRAO.

3.2 Band 3 Receiver Development

The Band 3 Receiver Development Team continues to impress the ALMA Project. The preliminary in-house acceptance of the first cartridge to be shipped brought many accolades from

the external reviews and, during recent trips to both Charlottesville and Madrid, the work of the Band 3 team was highly praised. The team is now preparing for the production phase which will start in a year and during which time one cartridge per month will be delivered to the ALMA Project! To be prepared for this tight schedule, the project is undergoing detailed production planning, contract preparation for outsourced packages, and the complete automation of the test sets. As well, the extremely important Critical Design Review is scheduled for the end of March 2007.

The first delivered Band 3 Cartridge has been tested together with the Band 6 cartridge at the Front End Integration Center in Charlottesville, hosted by the NRAO. Measured noise is in agreement with that determined at HIA. The Band 3 cartridge has already been used to check for radio frequency interference (RFI) between the two receivers and some leakage by the LO system of Band 6 was detected by the Band 3. Shielding of the room temperature components will resolve this problem. The acceptance review of the second Band 3 cartridge is scheduled for mid-December 2006.

Beyond the baseline ALMA project, the Band 3 team is in negotiations to build the Band 3 receivers for the sixteen additional antennas being built by Japan for the ALMA Compact Array. Other receiver contracts are being considered as well. It seems that the great news about the Band 3 receiver and instrument team is spreading throughout the millimetre radio astronomy community.

For more information on the ALMA Band 3 Receiver Project contact Keith Yeung (Project Manager, keith.yeung@nrc-cnrc.gc.ca), Stephane Claude (Project Engineer, stephane.claude@nrc-cnrc.gc.ca), or Doug Johnstone (Project Scientist, doug.johnstone@nrc-cnrc.gc.ca).

3.3 Software

In the CADC, Norman Hill began work in late September on the requirements gathering phase of the design and implementation of the Request Handler component of the ALMA Archive system. A preliminary project plan was submitted to the project team and was reviewed at a meeting during the ADASS conference in Tucson in October. The first version of the requirements document was submitted to the Archive team in November and is waiting a review response. Work has begun on the design.

Shannon Jaeger, Gary Li's replacement, has settled in to her new role at Calgary as an ALMA Offline Software Developer. At the moment she is working on MSPLOT enhancements. The MSPLOT tool is one of the packages most visible to end-users of the off-line system. Making MSPLOT astronomer-friendly will occupy most of her time for the next couple of months.

Arne Grimstrup has been hired to replace David Fugate working on the ALMA Common Software system. Arne currently works as a software developer at the Subaru Telescope and arrives at the University of Calgary on December 18 to join the Canadian ALMA Software team. In early January he will leave for a two-month visit at ESO in Munich, where he will undergo training in the ALMA Common Software system and be integrated into the international ACS development group.

Raymond Rusk continues to work on the atmosphere, quanta, measures, coordsys, and image tools mentioned in previous reports. Each of these new casapy tools already provides a significant portion of the functionality present in the old Glish-based tools. There are a number of work objectives necessary for completion of each tool including writing a new C++ interface to the CASA library, migrating the Glish test code into Python, and extensive documentation updates. In October, Raymond Rusk and Shannon traveled to the ADASS meeting in Tucson, Arizona, followed by a trip to the Array Operation Center in Socorro, NM.

Aside from his work on ALMA software, Raymond also presented a well-attended ALMA talk for the annual DRAO Open House on September 23, with video links to Victoria and Calgary.

Another ALMA offline software test is scheduled for March 2007. Raymond will be in Socorro to work with the NRAO team during the test period. Lewis Knee will also be present as one of the testers, acting as the Canadian North American ALMA Science Center representative. The fourth ALMA Pipeline User Test is now planned to begin in January 2007. James di Francesco from HIA will be one of seven testers who will examine the output from automatic flagging, calibration, and imaging of the scientific target and calibrators. This will be the first Pipeline test to process the data from the scientific target, in some sense our first end-to-end test. Chris Wilson has been helping the development team prepare for the test by examining results from the development data sets carefully and by editing and updating the documentation.

Chris Wilson wilson@physics.mcmaster.ca

Canadian ALMA Project Scientist

(with input from Séverin Gaudet, Jim Hesser, Doug Johnstone, Raymond Rusk, and Russ Taylor)

Milestones at NRC's HIA (2006 Fall)

edited by:

Dr. Jacques P. Vallée

Mid-September marked the 10th anniversary of the commissioning of the **HIA receiver B3** at the JCMT in Hawaii. B3, built by HIA in Ottawa, proved highly reliable and is still in use today in the 320-360 GHz frequency range (about 850 micrometres, in the Extreme Infrared). In 2004/2005, it was the most used heterodyne receiver, and it was responsible for 20% of the JCMT's output.

Also in mid-September, HIA's first **Band 3 receiver cartridge** passed a key milestone (preliminary acceptance inhouse) for ALMA, meeting and beating the expected specs. It was shipped to Charlottesville, and is now integrated into the ALMA cryostat.

Early October, HIA's DRAO in Penticton celebrated its 10th annual **Open House**. It was estimated that about 1000 visitors participated and were pleased with the many experiments provided.

Federal Minister of Natural Resources, **Honourable Gary Lunn**, launched National Science and Technology Week on 11 October at HIA's Centre of the Universe [CU], in the presence of media representatives and school children. The CU followed that up with many presentations to the public.

In October, Dr. **Thomas H Puzia** started as a Plaskett Fellow in Victoria. Thomas is a specialist of globular clusters and galaxies in the optial and infrared regimes.

One of the companies located at HIA DRAO's Industry Partnership Facility in Penticton won the Telus New Ventures BC Competition. **RFind Systems** received the prize at an awards ceremony on Sept. 28, for radio frequency identification tags for real-time location, having developed the hardware, firmware, middleware and software.

In mid-October, HIA presented staff awards to **David Bohlender & David Schade** for having completed 10 years of service at NRC, **Jim Jennings & Christine Cunningham** (HIA service award), **Frank Jian & Richard Hellyer** (HIA contribution award). Congratulations to all!

NRC President **Pierre Coulombe** and V-P Research **Richard Normandin** visited HIA in Victoria (9 Nov.) and Penticton (10 Nov.) to launch the new "NRC Strategic Plan 2006-2011".

HIA's DRAO launched a series of 5 lectures hosted by Okanagan College, and given from Nov. till March by **Ken Tapping, Chris Purton, Tom Landecker, Dean Chalmers & Tony Willis.**

In mid-November, **Scott Roberts** was appointed by the Thirty-Meter Telescope [TMT] Project as the Deputy Systems Engineer for the TMT. Scott will still be based in Victoria durig his tenure.

HIA's **Canadian Astronomy Data Centre** [CADC] celebrated in October a significant milestone, when ACSIS (auto correlation spectrometer imaging system) data started flowing freely from the JCMT in Hawaii to the CADC archives in Victoria. Soon, astronomers will log in to the CADC and download their data.

Du neuf à l'IHA du CNRC - automne 2006

édité par:

Dr. Jacques P. Vallée

La mi-septembre a marqué le 10e anniversaire de l'implantation du **récepteur B3 de l'IHA** au TJCM à Hawaii. B3, construit par l'IHA à Ottawa, s'est montré très fiable et est encore utilisé de nos jours dans le domaine de fréquence 320-360 GHz (environ 850 microns, dans l'infrarouge extrême). En 2004/2005, c'était le récepteur spectral le plus utilisé et il a permis de produire environ 20% de l'output du TJCM.

Aussià la mi-septembre, la première **cartouche réceptrice de la Bande 3** de l'IHA a franchi une étape importante (acceptation préliminaire maison) pour ALMA, en atteignant ou surpassant les specs promis. Elle a été envoyée à Charlottesville, et est maintenant incorporée dans le cryostat d'ALMA.

Début octobre, l'OFRA de l'IHA à Penticton célébra sa 10e **Porte Ouverte**. On a estimé qu'environ 1000 visiteurs ont participé à la fête et furent enchantés par les expériences offertes.

Le Ministre fédéral des Ressources Naturelles, l'**Honorable Gary Lunn**, a lancé la Semaine nationale de la Science et de la Technologie le 11 octobre au Centre de l'Univers [CU] de l'IHA, en présence des représentants des média et avec des écoliers. Le CU a enchaîné avec des présentations au grand public.

En octobre, Dr. **Thomas H Puzia** a commencé un terme comme Chercheur Plaskett à Victoria. Thomas est un spécialiste des amas globulaires et des galaxies aux ondes optiques et infrarouges.

Une des compagnies situées au Foyer des Partenaires Industriels de l'OFRA de l'IHA à Penticton a gagné le prix Telus New Ventures BC Competition. **RFind Systems** a reçu le prix lors d'une cérémonie le 28 sept., pour son développement (hardware, firmware, middleware, software) d'une plaque d'identification par fréquence radio pour estimer la position d'un objet.

En mi-Octobre, l'IHI a distribué ses prix à **David Bohlender & David Schade** pour leurs 10 ans de service au CNRC, **Jim Jennings & Christine Cunningham** (prix de service de l'IHA), **Frank Jian & Richard Hellyer** (prix de contribution de l'IHA). Félicitations à tous et toutes!

Le Président du CNRC **Pierre Coulombe** et le V-P Recherches **Richard Normandin** ont visité l'IHA à Victoria (9 nov.) et Penticton (10 nov.) pour lancer le nouveau "Plan stratégique du CNRC 2006-2011".

L'OFRA de l'IHA commence sa série de 5 lectures au Collège de l'Okanagan, données de nov. à mars par **Ken Tapping, Chris Purton, Tom Landecker, Dean Chalmers & Tony Willis.**

En mi-novembre, **Scott Roberts** fut nommé Ingénieur-député par le Thirty-Meter Telescope [TMT] Project. Comme avant, Scott sera basé à Victoria.

Le **Centre canadien de données astronomiques** [CCDA] de l'IHA a marqué une grande étape en octobre, lorsque les données d'ACSIS (auto correlation spectrometer imaging system) ont commencé à arriver du TJCM à Hawaii jusqu'aux archives du CCDA à Victoria. Bientôt, les astronomes vont liaiser avec le CCDA sur le web pour recevoir leurs données.

Early December, HIA's **CADC** announced its new FUSE Science Archive, with close to 40 000 individual FUSE exposures (delivered by STScI). CADC has a processing infrastructure to allow consistent reprocessing of the entire FUSE collection.

Début décembre, le **CCDA** de l'IHA annonça ses nouvelles Archives scientifique de FUSE, avec près de 40 000 clichés individuels de FUSE (délivrés par STScI). Le CCDA a mis en place une infrastructure pour le traitement et re-traitement homologue de toute la collection FUSE.

Reports

Canadian Space Astronomy Workshop (CSAW) - Report by *René Doyon*

Canadian Time Allocation Committee / Comité Canadien d'Allocation de Temps by Sara Ellison

Envelope Funding for Astronomy and Astrophysics

Canadian Space Astronomy Workshop (CSAW) - Report

René Doyon

The Canadian Space Agency (CSA) hosted the first Canadian Space Astronomy workshop on November 23 and 24 2006. More than 100 participants from academia, industry and government agencies gathered at the John H. Chapman Space Centre in St-Hubert to exchange and discuss future space astronomy missions and Canada's involvement in those missions. The goal of the workshop was to initiate the process of defining a balanced Canadian space astronomy program for the next decade up to ~2025. What are the big questions and which missions can address them? What will come after the James Webb Space Telescope (JWST)? What will be our top-priority space missions in the next Long Range Plan (LRP)?

The format of the workshop was designed to stimulate discussions rather than have formal presentations. The morning of the Day 1 was devoted to introductory talks. John Hutchings gave us a very interesting perspective and lessons learned from his three-decade long experience in space astronomy. Representatives from ESA, JAXA and NASA (represented by CSA since NASA could not attend because of US Thanksgiving) presented their future plans. In the afternoon, participants were invited to join five sub-groups divided by science theme, from the Solar system to cosmology, to focus on big science questions. On Day 2, 4 breakout sessions were held in parallel with participants from all science themes, this time to discuss specific missions that could address the science objectives identified on Day 1. A summary of all breakout sessions was presented to all participants followed by a general discussion.

A "call for ideas" was issued prior to the workshop to give participants the opportunity to present a brief written overview of their ideas in advance (mission and/or technology development). The majority of these ideas were briefly presented and discussed in the second breakout session; many of them were supported by posters which stimulated further discussions during coffee and lunch breaks. There was no shortage of ideas, big and small! Two dozen missions were briefly presented, the majority falling in one of those eclectic categories: solar system, exoplanets, wide field imaging, UV, x-ray, far-infrared and cosmic microwave background. A more detailed description of the missions/ ideas presented at the workshop will be available on the CSA web site (www.space.gc.ca/CSAW) by the end of this year.

One clear message that came out of the workshop was that Canadians are very keen to get involved in big missions as *leader* and/or major partner. The mission "package" discussed at CSAW would certainly be worth several billions of dollars; clearly, only a small fraction of those missions could be realistically funded. A first attempt was made to prioritize these missions but this exercise was somewhat premature given that we have yet to learn more about the missions that were (very briefly) presented.

CSA presented a brief overview of its nominal space astronomy budget over the next 10 years. Simply put, except for small missions in the $3M range and microsats in the $10M range (all to be competed for with other space disciplines), there are no funds yet identified that would allow Canada to either lead or be a major partner in a big mission on the scale of the Canadian contribution to JWST (approximately $100M over ten years). It is for the community to make the appropriate representations to our governments in order to raise these funds and the success of this lobbying exercise will rely much on having a well-developed plan i.e. a “short list”. It was clear right from the beginning that such a short list would not be the main output of the workshop but CSAW certainly unveiled several potential “front-runners” and, more comforting, names of people ready to go and lead these long haul projects.

What is the way forward? There is a clear path for small missions. CSA has set up a new structure of announcements of opportunities (AOs) that should be out in the next few months to enable such small missions. In addition there will be AOs for technology development which will help prepare for future missions (both large & small). For big missions, like for large ground-based observatories, the only realistic way to get them funded is to get a sufficiently broad community behind it, so that, as a community, we can argue convincingly that this is part and parcel of a LRP that is simply too good not to support. Therefore, the next step for the community is to get organized and focus on fleshing out the details of these big missions. CSA can help this process in many ways, for instance by organizing other workshops like CSAW and issuing relevant AOs like the one recently issued on Discipline Working Groups. It was apparent at the workshop that many of these groups are being formed. Communications between CSA and the community will be crucial to make this process as effective as possible. To keep the obvious momentum created by CSAW, JCSA has formally requested a special poster session and a one-hour town hall discussion on large space missions at the next CASCA in Kingston including participation from CSA. Of course, potential leaders are strongly encouraged to present their mission concepts in more details as a normal contributed talk/poster at the next CASCA. People are also encouraged to express their ideas and comments to JCSA (JCSA_Members@space.gc.ca) as to how one should proceed for coordinating future activities leading to the definition of our space astronomy program.

As expressed by many participants, CSAW was a very successful event, in particular to make the community aware of the urgency of planning our space astronomy program in the next two decades. CSAW was only the beginning of a process; hopefully, within 2 years, we shall have new exciting space projects in the executive summary of the next LRP.

René Doyon
Université de Montréal
Chair of the CSAW scientific organizing committee and member of JCSA

Canadian Time Allocation Committee Gemini N&S and CFH Telescopes Summary for semester 2007a

Comité Canadien d'Allocation de Temps Télescopes Gémini N&S et CFH Sommaire du semestre 2007a

Proposal Statistics

CFHT: For this semester, 28 Canadian proposals were received, requesting 80 nights. The allocated time for Canada was 23 dark nights for the Legacy Survey, and 39 nights for the regular proposals. Thus the Canadian oversubscription (requested time to available time) was 1.7 overall (including the Legacy Survey). After subtracting the LS obligation, the general observer proposals faced an oversubscription of 2.1.

Statistiques des demandes de temps

TCFH: Pour ce semestre, 28 demandes de temps canadiennes ont été reçues, et un total de 80 nuits fut demandé. Le temps alloué pour le Canada fut de 23 nuits noires pour le Relevé du Legs [LS], et de 39 nuits pour les demandes de temps. Le facteur de pression canadien (temps demandé/disponible) fut de 1.7 au total (incluant le Relevé du Legs). Si on ote l'obligation LS, les demandes de temps générales font face à un taux de sursouscription de 2.1.

Gemini: For Gemini North, CTAC received 39 proposals requesting 405 hours, and for Gemini South CTAC received 13 proposals requesting 152 hours. Given Canada's share of 224 hours on GN and 126 hours on GS, the Canadian over-subscription was 1.8 for GN and 1.2 for GS.

Gémini: Pour le télescopes Gémini Nord, le CATC a reçu 39 demandes pour 405 heures, et pour Gémini Sud le CATC a reçu 13 demandes pour 152 heures. Comme la part du Canada est de 224 heures sur GN et de 126 heures sur GS, ceci done un facteur de pression de 1.8 sur GN et de 1.2 sur GS.

Peer review: Two independent referee reports were requested for each proposal. The referees' response rate was very good with 84% for CFHT, and 81% for Gemini. CTAC wishes to thank the many referees for their valuable scientific evaluations.

Arbitrage: Pour chaque demande TCFH ou Gémini, on a fait participer deux arbitres indépendants. Le taux de réponse des arbitres a été très bon: 84% pour le TCFH, et 81% pour Gémini. Le CATC veut remercier les arbitres pour leur travail scientifique de qualité.

CTAC meeting & voting members

Réunion du CTAC et membres votants

Current members of CFHT/Gemini CTAC are:

Les membres du CATC pour les télescopes Gémini & TCFH sont:

Doyon, René (Univ. de Montréal)
Ellison, Sara (Univ. Victoria), Chair/Présidente
English, Jayanne (U. Man. - Winnipeg)
Ferrarese, Laura (NRC-HIA Victoria)
Hoekstra, Hendrik (Univ. Victoria)
Martel, Hugo (Univ. Laval, Québec City)
van Kerkwijk, Marten (Univ. Toronto)
Wade, Gregg (RMC Kingston)

The CTAC Technical Secretary, Dr. **Jacques P. Vallée** (NRC-HIA, Victoria), supervises a number of things, including computer processing, communication linkage, procedure and interface with HIA.

Le Secrétaire Technique du CATC est le Dr. **Jacques P. Vallée** (IHA, Victoria), supervisant le processus informatique, les liaisons de communication, la procédure et l'interface avec l'IHA.

The CTAC meeting was held on 3 & 4 Nov. 2006 at the Univ. de Montréal. As always, CTAC ranked proposals according to their scientific merit and technical feasibility.

La réunion du CATC a eu lieu les 3 & 4 nov. 2006 à l'Univ. de Montréal. Comme d'habitude, le CATC a classé les demandes selon le mérite scientifique et leur faisabilité technique.

CTAC points of interest

1. The Canadian over-subscription on Gemini South was considerably less than on Gemini North. This is a regular occurence and proposers are therefore encouraged to consider Gemini South where their instrument choice permits.

2. Gemini proposers should split their total requested time between partner countries. Whilst there is no fixed formula for the division, an approximate division by co-Is is usual.

Points d'intérêt du CATC

1. La sur-souscription canadienne pour Gémini Sud est considérablement plus basse que pour Gémini Nord. Ceci arrive régulièrement, et on encourage les demandeurs d'utiliser Gémini Sud lorsque leur choix d'instrument le permet.

2. Les demandeurs de Gémini devraient apportionner leur demande totale en temps entre les pays partenaires. Il n'y a pas de formule fixe, mais une division approximative entre les co-Is est suggérée.

International TACs

CAT Internationaux

At these international meetings, joint proposals are discussed, and time assignments and scheduling are finalised. The final observing schedules can be seen on the CFHT and Gemini web pages.

The CFHT International TAC/SAC met during the SAC meeting held in mid-Nov. 2006. Due to the unavailability of the CTAC Chair, Henk Hoekstra represented Canada at the Gemini ITAC. The members of the Gemini ITAC met in late Nov. 2006.

As usual, CFHT & Gemini TAC summaries and copies of referee reports (names withheld) are sent from HIA in Victoria by email to the PIs of the proposals.

PS: 2007A represents Sara Ellison's final semester as CTAC Chair. She would like to express a very sincere thanks to both her committee and also to the Canadian community as a whole for their valued contributions to the TAC process."

À ces rencontres internationales, on discute les demandes conjointes, et on finalise les allocations de temps et l'horaire.

Le CAT International pour le TCFH s'est réuni pendant la rencontre du Comité Scientifique Aviseur en mi-nov. 2006.

Vû l'absence de la présidente du CATC, Henk Hoekstra a représenté le CATC auprès du CAT International. Les membres du CAT international pour Gémini se sont réunis en fin nov. 2006.

Comme d'habitude, l'IHA envoie aux chercheurs principaux par courriel depuis Victoria les rapports des arbitres (anonymes) et le sommaire du CATC.

PS: 2007A est le dernier semestre présidé par Sara Ellison. Elle voudrait exprimer ses remerciements sincère à son comité et aussi à la communauté canadienne en entier pour leurs contributions appréciables au processus d'allocation de temps.

Sara Ellison
Chair, Canadian Time Allocation Committee (CTAC) for Gemini and CFHT

Sara is a Professor at the Univ. of Victoria, BC. Much of her research involves distant galaxies and quasars.

CTAC Chair, Sara Ellison, on horseback in Kyrgyzstan in the summer of 2006.

Sara Ellison
Présidente, Comité d'Allocation de Temps Canadien (CATC) pour Gémini et le TCFH.

Sara est professeure à l'Université de Victoria, CB. Sa recherche touche les lointains quasars et galaxies.

La Présidente du CATC, Sara Ellison, à cheval au Kyrgyzstan à l'été 2006.

Envelope Funding for Astronomy and Astrophysics

Last spring following a discussion in Grant Selection Committee 17, NSERC (Samir Boughaba, Team Leader, Physics, Astronomy, Major Resources Support) issued the following update on this initiative:

"You will find in this message an update on our current initiative with respect to the funding of the Space and Astronomy Grant Selection Committee (GSC). This matter was thoroughly discussed during the 2006 policy meeting of the Committee.

In an attempt to effectively address the needs of the communities that are served by the Space and Astronomy GSC, we are considering the adoption of an envelope as a funding mechanism. Such a mechanism has been demonstrated to be very successful for the subatomic physics community, which has needs that are similar in a number of respects to those of the space and astronomy communities. Prior to any decision, we will undertake a thorough and extensive consultation of the communities. This consultation will be led by an ad hoc advisory Committee of highly regarded members of the space and astronomy communities and their representative bodies. The consultation will be carried out through different formats (e.g., town hall meetings, web-based surveys, interviews). The Committee will have a focused mandate, and it will advise NSERC, through a report, on the appropriateness of this funding mechanism, and recommend possible structures for the envelope. The Committee will be established by the fall of 2006. The 2007 competition will not be affected by this process, and the existing funding mechanism will be used.

As you may know, NSERC will also be reviewing in the near future the structure of its GSCs to ensure that the latter efficiently cover all the disciplines and areas, including the many emerging ones, in Natural Sciences and Engineering. Both initiatives will complement each other."

The Board has discussed the issues extensively once again and will be working openly with NSERC to facilitate this exercise. The latest information is that NSERC hopes to have this ad hoc "Envelope Evaluation Committee" in place by the end of this calendar year. The timetable is to launch the consultations early in the new year and reach some conclusion by 2008 for implementation for the 2009 competition. The exercise on Realignment of Committees would conclude in 2009, for implementation in 2010. This could turn out be an ideal convergence of reviews and evaluations whose outputs will be how best to provide the strongest possible support to our community.

ACURA is in the process of developing input on these issues as suggested in the Mid-term Review of the LRP. It is assumed that ACURA will be commenting from the perspective of the institutions that have a stake in astronomical research rather than from the perspective of individual astronomers.

Briefly Noted

New CASCA Awards

Thanks to an ad hoc committee, great progress has been made in enhancing the program of awards presented by the Society. The CASCA Board has approved the following guidelines for new awards and is now focusing on the practical issue of funding!

a) *Mid-Career Achievement Award*

The Mid-Career Achievement Award recognizes significant contributions to astronomy by a member of CASCA who is within the bracket of ten to twenty years of receipt of their PhD degree. The terms of the award are:
i) Normally awarded every two years following the recommendation of the CASCA Awards Committee. The award will be in the alternate years with the Beals Award.
ii) Cash prize in an amount determined by the CASCA Board, plus a certificate.

b) *Award for Innovation in Astronomical Research Tools*

The Award for Innovation in Astronomical Research Tools is presented by CASCA to an individual who is a CASCA member or a team led by a CASCA member for the design, invention, or improvement of instrumentation or software that has enabled significant advances in astronomy. The terms of the award are:
i) Normally awarded every two years following the recommendation of the CASCA Awards Committee.
ii) Cash prize in an amount determined by the CASCA Board plus a certificate.

c) *Award for Distinguished Service*

The Award for Distinguished Service is presented by CASCA to an individual who has made sustained contributions in service (e.g., to innovations in education, outreach, or outstanding delivery thereof, or to support of research facilities or tools used by others) that have strengthened the Canadian astronomical community and enhanced its impact regionally, nationally and/or internationally. The terms of the award are:

i) Normally awarded every two years following recommendation of the CASCA Awards Committee.

ii) A cash prize in an amount determined by the CASCA Board plus a certificate.

Notes on JWST and UVIT

JWST continues to progress well towards its June 2013 launch date. All major technology developments are on track for a flight readiness review in January: this includes the sunshade, detectors, mirror segments, wavefront sensing, cryocooler, microshutter, asics, and cryogenic structures. The Canadian FGS narrow band imager has a prototyped etalon coating that works from 1.6 to near 5 microns. The telescope, optics, all instruments, and attitude control system are progressing through their design reviews, and quite a lot of hardware is already in hand, including all 18 beryllium primary mirror segments. The budget is stable and the schedule to launch looks achievable.

There will be a scientific meeting in Tucson in Sept 2007 which will focus on the science of JWST and other new facilities for the next decade. Canadian scientists are members of the NIRCAM and NIRSPEC instrument teams, as well as the team for the Canadian instrument. The January AAS meeting in Seattle will feature a special JWST reception, and the full-scale model from Northrop Grummann, with talks by several key persons, including the US project scientist, John Mather, who shares this year's Nobel prize for his work on the cosmic background explorer satellite.

The ASTROSAT project is ramping up as the Sept 2008 launch approaches. Canada is providing the photon-counting detectors for the two UV telescopes (UVIT) on board this ISRO (Indian space agency) observatory. The other instruments are co-aligned X-ray telescopes of different kinds, and an all-sky X-ray monitor. The first joint ASTROSAT science teams meeting was held in Bangalore in September, attended by four of the Canadian UVIT science team. The details can be seen at http://www.iiap.res.in/uvit/uvitwork.html. Canada will have access to all instruments via UVIT team time and a guaranteed amount of competed time for the mission.

The UVIT flight detector components have been fabricated, tested, and selected, and the detector system design is essentially complete. Imaging performance is being tested using data from a laboratory detector system. The scientific calibrations will be done in the vacuum UV facility at the University of Calgary, during 2007, and the laboratory is being upgraded for the job.

John Hutchings

Canada-France-Hawaii Telescope 2007 Users' Meeting

CFHT Users' Meetings take place every three years and their location alternates between France and Canada. These Users' Meetings are a unique opportunity to gather the users of the telescope as well as the Agencies funding the Corporation to share scientific and technical achievements as well as ideas for the years to come…

The next CFHT Users' Meeting will take place on May 9 to 11, 2007 in downtown Marseille, France. It will come at a time when exciting scientific results are being published using the three highly competitive instruments in operation, MegaCam, WIRCam and ESPaDOnS, more observing time is expected to be made available in mid-2008 with the end of the bulk of CFHTLS observations, and many questions and ideas are in the air about what to do with the telescope in 2011 and beyond.

The 2007 Users' Meeting will therefore offer the opportunity to present and discuss a few "hot topics" on three main themes:

A review of the ongoing science

- The latest news on the scientific results of the CFHT Legacy Survey, which represents a huge investment of observing time on CFHT.
- A highlight on other ongoing scientific programs, including the spectacular results from the first two years of operation with ESPaDOnS, with ample space for posters and enough time for key oral presentations.

What to do once the CFHTLS is completed?

In the [2008-2010] period, the 100-night a year currently used by the CFHTLS will be available to the CFHT communities for large programs on either (or all) of the three main instruments CFHT will offer, for another Legacy Survey, or for PI programs. What would you like to see happening:

- A follow-up of the CFHTLS? (continuation of current topics with MegaCam and WIRCam)
- A CFHTLS-2? (new topics, eg a joint MegaCam/WIRCam survey for stellar physics)
- Observing campaigns on ESPaDOnS?
- Other ideas?

2011 and beyond

The current "Golden Age Plan" calls for the CFHT Corporation to be in good shape staff- and operation-wise by the end of 2010. A few questions remain to be answered in a relatively near future to see what happens next.

- What level of accessibility to the observatory do the current CFHT communities want to maintain beyond 2011?
- Which instruments in addition to the current ones should be made available?
- Back to high angular resolution (VASAO or other AO developments), and for which instru-men-tation?
- Interferometry ('OHANA , …)
- Spectropolarimetry in the IR (SpIRou)?
- Very high accuracy radial velocity observations?
- A bigger WIRCam?
- ...?

The theme of the 2007 annual CASCA meeting, to be held one month after the CFHT Users' Meeting, is: "Big science in small packages: smaller-scale facilities in an era of large-scale projects". CFHT is an excellent example of such facilities. So, if you are a CFHT user or if you are interested in the future activities of the telescope and in the Canadian involvement in this future do not hesitate and make the trip to Marseille!

Whichever way you wish for CFHT to evolve into, you will have to make it known in order to make it happen. So, look at the information given on the **Users' Meeting web site**, accessible from the CFHT web page at www.cfht.hawaii.edu. Register, submit talks or posters you would like to present, and participate!

In order to prepare the 2007 Users' Meeting, a **web/email based forum** has been set up and you are encouraged to register. Discussions are going to start any time now. The forum is visible by all, but posting is restricted to those who register.

Thanks in advance for your involvement, which is going to be essential to draw the future of your access to CFHT.

45580 Renéracine

The first asteroid discovered in Québec named in honor René Racine. Discovered 2000 Feb. 10 by the amateur astronomer Denis Bergeron at Val-des-Bois, the first asteroid discovered in Québec will now bear the name 45580 Renéracine. The citation saids:

René Racine (b. 1939) has served as director of the Mt. Mégantic Observatory (1976-1980, 1984-1997) and the Canada-France-Hawaii Telescope (1980-1984). His research interests cover globular clusters, galaxies, astronomical instruments and adaptive optics. Some of his projects have earned him international renown.

In The Classroom

Education Notes by Heather R. (Scott) Theijsmeijer

Putting Students to the Test by Heather R. (Scott) Theijsmeijer

A CWL Tour of the Okanagan by Jayanne English

Education Notes

John Percy Inducted into University of Toronto Teaching Academy

At the University of Toronto's inaugural Teaching and Learning Symposium in October, John Percy was recognized for his contributions to the education field by being one of the first inductees into the newly formed University of Toronto Teaching Academy.

John's inductance to the academy was preceded by the receipt of one of five President's Teaching Awards. The award recognizes both research in teaching and sustained excellence in teaching, as well as the integration of teaching and research. As a member of the academy, John will be an advocate for excellence in teaching, advise the vice-president and director of the Office of Teaching Advancement, and assist in the assessment of teaching at the University.

For more information, see http://www.news.utoronto.ca/bin6/061031-2683.asp

Congratulations, John!

Science with Impact!

Let's Talk Science (http://www.letstalkscience.ca) has recently released a new outreach training program aimed at helping professionals prepare outreach activities for youth.

Science with Impact is a kit which contains a facilitator manual, workbook, CD-ROM and DVD, all of which provide scientists with information on outreach, practical examples and best practices models of outreach methods. The workbook kit is available in both French and English, and offers strategies to plan activities for a variety of settings.

For more information (including ordering information), visit http://www.letstalkscience.ca/main/outreach_training_for_scientists/

CASCA Education/Public Outreach Represented at Ontario Conferences

John Percy traveled to Ottawa for the third annual *Science and Technology Awareness Network (STAN) conference*, November 9-10. Highlights included a keynote address by Sir Roland Jackson, Chief Executive of The British Association for the Advancement of Science. John facilitated a breakout discussion session on “understanding gender specific issues in education,” based on a talk by the same title by Dr. Jodi Asbell-Clarke (TERC, Saint Mary’s University). John is also a member of the STAN steering committee.

http://www.scienceandtechnologynetwork.ca/

Heather Theijsmeijer traveled to Toronto to participate in the Science Teachers’ Association of Ontario (STAO) conference, Nov. 17, to present a talk on integrating astronomy into both science and non-science courses. The talk was well-received by secondary school teachers, and among other things, highlighted resources found on the CASCA education website.

http://www.stao.org

Putting Students to the Test

At this time of year everybody is swamped with exams. Every semester, it seems there are always students who miss those really easy questions. Sure, there are some students who seemingly refuse to study, but many other bright students just simply don't do well on tests and exams. This can lead to frustration and a lack of interest on the part of otherwise enthusiastic students.

Experiencing success in a course is key to ensuring that a student stays motivated and continues in astronomy or science, which may eventually lead to more students in these programs at higher levels. Success on tests and exams is just one way of encouraging students.

Many instructors are hesitant in changing their testing style because they do not want to sacrifice the integrity of the course. While the exam (or, any test for that matter) is designed to evaluate the students on their knowledge of course material, there are several ways in which we can make tests and exams a little easier, without changing the content or difficulty of questions.

1. Start with easy questions, end with challenging questions

Begin with low-order thinking skill questions (multiple choice, fill-in-the-blank, True/False, simple definitions) and then work toward the open ended questions, calculations and interpretation questions at the end of the test. Experiencing success at the beginning can often motivate the student to continue right to the end of the test. It's much better than being "blown out of the water" on the very first question!

2. Group similar-themed questions together.

Within any section of the test (multiple choice questions or long-answer), keep questions on specific topics together. For instance, ask three questions on celestial motion, then two on lunar phases, three on telescopes etc. It is easier for the student to maintain their train of thought on one topic for a few minutes rather than jumping around between topics.

3. Be specific in your questions.

Instead of saying “Compare O stars to K stars,” say “State three differences between O stars and K stars.” This subtle cue tells the writer exactly what they need to do to finish a question and get good marks. On higher-order thinking questions, this also gives the student a better sense of when she or he is done the question and can move on to the next one.

4. Teach test-taking skills.

This doesn’t have to take up much time in a lecture, but reminding students of how to write a test can help them stay focused and better prepare. Here are some suggestions:

- If you are not sure of a question, star it and then come back to it later (ensure you do the ones you know first to make sure you get those marks).
- Unless the marker is taking off marks for incorrect answers, every single multiple choice, true/false question should be answered, even if it is a guess (you may guess correctly!);
- Every 20 minutes or so, look up from your paper, stretch a little and take a few deep breaths to help you clear your mind, relax and then refocus on the next part of the test;
- Read through the test *in its entirety* first. This will allow you to immediately find the questions you’ll know how to do, and give you a sense of how to budget your time. Some students use this time to highlight key words (such as, “choose **ONE** of the following”);

5. Show the mark breakdown and suggested times.

On the test or exam itself, breakdown the marks both by section and by question. For example, Part A contains 12 questions, worth 20 marks total. Each question will then have the allotted marks beside it in brackets (square brackets work well as they separate the marks from the question text). Also, include suggested times for each section. This can either go on the cover sheet of the exam, or listed with each part.

6. Be consistent.

Finally, use a template when designing your tests and exams so that the students become familiar with your writing style. Using the same layout and types of questions – always starting with about the same number of multiple choice questions – will help eliminate surprises and reduce stress which can lead to frustration.

All of these suggestions can help reduce student stress and anxiety, making test-taking (and marking!!) easier. Take a look at your recent set of exams – is there a way you can encourage more success from your students?

A CWL Tour of the Okanagan

by Jayanne English

Although somewhat after the Wine Festival, mid-October is still a fine time to tour the Okanagan with a CASCA Westar Lecture (CWL) in tow. The Okanagan chapter of the Royal Astronomical Society of Canada organized 4 venues associated with Okanagan College in 2 towns (Vernon and Kelowna) and audiences ranging from college students to retirees. My pleasant responsibility was to present talks demonstrating how astronomy images are made, while describing the scientific content in those images. The students at Okanagan College (Vernon) shook my hand with appreciation and the members of this energetic and active RASC chapter were very attentive and enthusiastic about my visit. Having aquired telescope mirrors, they have found a site for the observatory they plan to build and I also enjoyed hearing about their "sidewalk astronomy" outreach program. I expect that they will be particularly successful participants in the International Year of Astronomy 2009 activities.

An attentive and appreciative audience!

The author with Guy Mackie

Although moderately attended, the public lecture audience was attentive and interesting. (I would like to produce suggested promotion guidelines for groups arranging public lectures based on the experience of CASCA members who have organized such lectures, say for CASCA meetings. If you have suggestions please email me at Jayanne_English@umanitoba.ca.) I feel the most successful event of the Okanagan CWL tour was the 2 hours spent with the Society for Learning in Retirement, which was very well attended. This is a peer education group and I used the opportunity to assign some pair-share issues and then wander about the audience to find out how individuals were approaching these questions. There was a lot of energy and very good questions from the audience, which has an impressive knowledge of topics like synchrotron radiation! Guy Makie did an excellent job of organizing this series of events, Richard Christie was tireless in his arrangement of venues and equipment, Colleen O'Hara - who drove me everywhere - provided me with information about the RASC and astronomy in the region, and Jim and Bitten Tisdale were most astounding hosts. This thoroughly enjoyable CWL tour, due to its proximatey, also provided the opportunity for a pleasant, brief visit with colleagues at DRAO.