

## **GAC Report for December 2012**

### Members:

Tim Davidge (2009-13) National Research Council (Chair)  
Pauline Barmby (2012-15) University of Western Ontario  
John Hutchings (2009-13) National Research Council  
Roland Kothes (2009-13) National Research Council  
Laura Parker (2012-15) McMaster University  
Kristine Spekkens (2011-14) Royal Military College  
Kim Venn (2009-13) University of Victoria  
Ludo van Waerbeke (2011-14) University of British Columbia  
Kenneth Tapping (continuing member, spectrum management) National Research Council

### Activities:

In the time since the last report (May 2012), the GAC has addressed three issues involving ground-based Canadian facilities:

1)JCMT. At the request of Scott Chapman, the GAC discussed the future of the JCMT, with emphasis on the potential impact of the facility closing in 2014. The GAC recommended that means be found to keep the facility open to allow the completion of the Legacy programs. The GAC recognized that the LRP states that Canadian involvement in the JCMT would end in 2014, and so the GAC recommended that a cost-effective way be found to maintain short-term Canadian involvement in a way that does not perturb LRP priorities.

2)Gemini Governance. At the request of Greg Fahlman, the GAC discussed issues related to Canadian involvement in the Gemini telescopes. Topics discussed included the Canadian share of observing time, the mix of time between sites, and the operational model.

3)CFHT. At the suggestion of Greg Fahlman, the GAC is presently discussing issues related to the role of CFHT in the suite of Canadian ground-based observatories. Issues discussed include the mix of PI to survey time, the nature of future instruments (work horse versus program-specific), and the role of the facility in the context of supporting other existing and planned facilities. It should be noted that the purpose of this discussion is not to conflict with the CFHT SAC – rather, it is to provide broad guidelines provided by representative members of the Canadian community that should be considered by the SAC when discussing the future of this facility.

### Search for new Chair:

I have been on the GAC for a number of years, and have chaired the committee for the past two years. I will be stepping down as chair in May when my term ends. I encourage the CASCA council to identify a new chair to help make an orderly transition.

Tim Davidge

December 3, 2012

## **GENERAL GUIDELINES FOR THE FUTURE OF THE CFHT**

The Ground-based Astronomy Committee of the Canadian  
Astronomical Society, December 4, 2012

### OVERVIEW:

Until recently, the CFHT was the crown jewel of the Canadian ground-based optical/near-IR program. While the Gemini telescopes are now the premier Canadian optical/NIR facilities, the CFHT continues to see active use, and this is largely due to the superlative site characteristics. During the coming decade new Canadian facilities are expected to come on line (e.g. the TMT, SKA), and it is anticipated that the Canadian community will want the CFHT to be in a position to complement these facilities (e.g. placing narrow field observations of faint sources obtained with the TMT or SKA in a wider field context, or providing spectroscopic follow-up of new imaging surveys). There is also the prospect of increased time exchange between facilities - if CFHT is to benefit from such opportunities then it should be positioned to offer capabilities that users who are not part of the CFHT consortium will want to access. This will in turn give Canadians access to facilities that they might not otherwise be able to use.

The GAC recommends the following guidelines for the future of the CFHT.

#### 1) Exploit the CFHT site

The strengths of the current facility and the site must be recognized for continued use by future generations of Canadian astronomers. The paramount characteristic of the site is its excellent image quality. Exploiting the seeing of the CFHT site has proven to be of great benefit to the Canadian community, and will undoubtedly continue to be of interest in decades to come. The good IQ of the CFHT also provides a niche that will be beneficial to the CFHT when supporting other Canadian OIR facilities AND makes the CFHT valuable for time exchanges. Given that facilities like the TMT, SKA, and ALMA will observe sources that are much fainter than have heretofore been possible to study, it will be desirable to increase the light gathering power of the CFHT to allow it to probe fainter sources than is

now possible.

The GAC thus recommends that any strategy for improving, upgrading, or re-instrumenting the CFHT continues to place emphasis on exploiting the good natural image quality - proposals in which the facility is relegated to a 'light bucket' should not be considered. From the context of providing long-term support for other Canadian facilities, it is recommended that the CFHT be upgraded to enhance its light-gathering power, while also maintaining a wide field of view.

2) Deploy instrumentation that is of interest to the broad Canadian user community

As a national facility, the CFHT has tended to offer instruments that have broad, work horse capabilities. A recent study by Dennis Crabtree has shown that of the three instruments currently on the CFHT (MegaCam, WIRCam, and EspaDons), MegaCam has produced 4 -- 5 times more papers than the other two instruments combined. This shows the broad appeal of wide-field science at visible wavelengths to the Canadian community.

The GAC recommends that the CFHT instrument complement should maintain capabilities that are attractive to the Canadian community in general. Past experience suggests that this is best accomplished by instruments that offer work horse capabilities at visible wavelengths. In addition, work horse instruments also tend to have the highest degree of complementarity with other facilities in the Canadian ground-based and space-based facility suite - the prime example is GMOS on Gemini.

This does not mean that instruments that are geared for a specific program should be avoided entirely. It is recognized that some program-specific instruments may have broad applications to the community in general. In addition, there may be operational models where there are multiple instruments available, and a model in which some of these have work horse capabilities would also be acceptable. The GAC recommends that the CFHT not be configured in such a way that a niche instrument, that is of interest to only a small fraction of the community, is the only capability available.

3) Continue to offer PI access:

More and more time on 4 metre facilities is being dedicated to

surveys, and the CFHT has been no exception. Still, there is continued pressure to continue PI science programs, which involve time requests that span a few nights, to those that extend over many semesters. PI and survey programs each have metrics that indicate that they are of interest to the user community. Dennis Crabtree has shown that PI driven programs produce more papers than those that result from surveys. However, surveys produce higher impact papers. Given this dichotomy in success metrics, the GAC recommends that the CFHT maintain a mix of PI and survey programs, notionally at the current level. A change in this recommendation could be spurred by a drop in subscription rates for PI programs.

4) Consult with the Canadian user community, and provide realistic projections for project success and timing.

The age of CFHT is such that to remain scientifically competitive, the facility needs to be upgraded and to provide some kind of dedicated/unique capability. It is the view of the GAC that new instrumentation should not take priority over the pressing need for a major upgrade of the telescope as a whole. Major upgrades will require that the facility be closed for an extended period of time. It is therefore important that the Canadian community be allowed to evaluate the expected payout that would be delivered at the end of any major upgrade.

In order to maintain flexibility in a rapidly changing astronomical landscape, the GAC recommends that the CFHT should at present also avoid making other commitments that may tie up the site for up to a decade (e.g. very long-term surveys). Changes should also be avoided that may potentially (1) affect the ability to support other Canadian facilities, (2) affect the attractiveness of the facility for time exchanges, and (3) discourage potential new CFHT partners in an upgraded facility.

#### **JCMT Statement (Issued by the GAC on August 15, 2012)**

The JCMT has been a partnership between the UK (55%), Canada (25%) and the Netherlands (20%). The partnership will change in March 2013, with the withdrawal of the Netherlands. The STFC, the UK funding agency for JCMT, has committed to operations of JCMT until the end of September 2014, matching the commitment by Canada. The agencies have announced that at that point, unless a

new partner is found, funding for the JCMT will cease.

During the first decade that SCUBA was present, the JCMT was the world's primary sub-millimetre telescope, providing Canadian, UK and Dutch astronomers access to unobscured measurements of star formation within our galaxy and at cosmological distances. This past year the facility received a major new camera, SCUBA-2, which is the world's fastest mapping instrument at 850 microns. At 450 microns it can map four times deeper than Herschel-SPIRE, with a beam size four times smaller. The scientific potential of SCUBA-2 has kindled broad Canadian interest in the JCMT, making it one of the most over-subscribed Canadian ground-based facilities during recent semesters.

With the closure of the JCMT, Canadian astronomers will lose a forefront facility that gives Canadians a competitive advantage for exploiting ALMA. Six coordinated Legacy surveys are presently underway at the JCMT, and risk not being completed with the planned 2014 closure. These surveys will have lasting value that will support ALMA science, and will provide a legacy that will last at least into the CCAT era. An extension of even a year or two would have an enormous scientific impact. These surveys have substantial Canadian leadership and participation, and through these surveys, as well as ongoing PI programs, SCUBA-2 has already demonstrated the kind of exciting science results that made SCUBA so successful.

Members of the Canadian astronomy community are searching for a new way to keep the JCMT funded through 2016. Canadian astronomers and their UK colleagues are seeking partners to provide at least a portion of the operating budget, which is at present about \$4M per year. The intent is to tap Canadian funds that will not disrupt the priorities set out in the Long Range Plan (LRP). Highest priority would be given to completing the Legacy surveys, and an option that is being investigated is that of a stripped-down, SCUBA-2 only mode of operation with little user support and no future development program. Two years extended operation may also allow the implementation of Canadian-lead JCMT instruments (Pol-2 and the FTS, which are SCUBA-2 'add-ons') that are funded and at various levels of development and commissioning.

Given the scientific importance of the JCMT to the Canadian astronomy community and the utility of the Legacy surveys, the GAC endorses efforts to find alternative means of funding operations at the JCMT for an additional 2 years. To ensure

funding success in a highly competitive - and restrained - environment, it is recommended that a simplified operational model - that focuses on the timely completion of the legacy surveys - be pursued.