Optical and Infrared Astronomy Committee (OIRAC) Report to the CASCA Board, Dec, 2007

Submitted by M. Balogh on behalf of the OIRAC.

1 Membership

Name	Membership expires
Doug Welch	May 2008
Tim Davidge	May 2008
Michael Balogh (Chair)	May 2009
Pierre Bergeron	May 2009
John Hutchings	May 2010
Chris Willott	May 2010

Chris Willott recently joined OIRAC for a three year term. John Hutchings was reappointed for a three year term.

2 Recent OIRAC activities

Our last report to the board was submitted June 2007 and is available, with previous reports, from our web page at http://astro.uwaterloo.ca/OIRAC.

Following is a report of OIRAC activities from June-Nov 2007.

2.1 Meetings

1. A Skype teleconference was held on Oct 26, 2007. All OIRAC members were present. Chris Willott gave a brief summary of the recent GSC meeting. OIRAC considered a proposal from Greg Fahlman, that we form a Canadian Gemini Science Committee to act as advisory to the GSC. OIRAC unanimously agreed this was a good idea and, after some discussion, decided upon the structure as described in section **??**.

2.2 Gemini Science Committee

On July 3, 2007, Greg Fahlman requested that OIRAC nominate two members to the newly-constructed Gemini Science Committee. Doug Welch abstained from discussion on this issue, due to conflict of interest through his position as Gemini Board Chair. The rest of OIRAC had an email exchange to come up with a list of five candidates, which was passed along to Greg on July 13. OIRAC was informed on Aug 31 that, from this list, René Doyon and Chris Willott had been selected by Gemini to serve on the GSC.

Greg also suggested that OIRAC consider forming a Canadian Gemini Science Committee (CGSC), in light of the new GSC structure. In particular, since Canadian Gemini Office staff

are explicitly barred from participation in the GSC, there is no longer a clear link between the GSC and the broader Canadian community. The CGSC would thus serve as an advisory body to the GSC.

OIRAC discussed this during a telecon on Oct 26 and decided upon a committee with the following structure (closely following Greg's initial suggestion):

- 2 GSC members (currently Willott, Doyon)
- 1 CGO group leader (currently Stephanie Cote)
- 1 outside board member (currently Yee)
- 1 OIRAC chair (currently Balogh)
- 4 additional members from the community. At least one of these should have a strong background in "long-wavelength" astronomy (mid-infrared or longer), since mid-infrared instrumentation is an important component of Gemini's future.

Invitations were extended to the following four people, all of whom agreed to serve on the committee:

- Mike Fich (3 years)
- Laura Parker (3 years)
- Laura Ferrarese (2 years)
- Luc Simard (2 years)

Terms are staggered to allow continuity in membership. The interim chair is Chris Willott, but the committee may elect it's own chair during its first meeting.

2.3 Infrared Spectrum Management

On Nov 26. 2007 OIRAC was contacted by Ken Tapping, who represents the interests of Canadian radio astronomers at international spectrum management meetings in Geneva and with Industry Canada. Ken requested some information from OIRAC, on the infrared usage and requirements of Canadian astronomers. This is important to ensure that Canadian interests are represented when and if the International Telecommunication Union begins to make allocations of low-attenuation wavelength ranges for anticipated space-to-ground infra-red links. OIRAC notes that this is an excellent example of how the interests of the astronomical community are best served by a committee that oversees all ground-based astronomy, rather than by committees arbitrarily divided by wavelength.

The following information was provided to Ken on Dec 6:

Access to the infrared (defined here as wavelengths 1–30 microns) spectrum is of great importance to most, if not all, Canadian astronomers. Canada has part- or full ownership of five telescopes currently in operation with infrared instrumentation. Two of these are located within Canada (l'OMM and ARCT), while the others (CFHT, Gemini-N, Gemini-S)

are located in other countries (see table below). In addition, Canadians are users of infrared-capable telescopes that offer international time (KPNO, CTIO) or time-exchange programs (Subaru, Keck). Through collaboration, Canadians also make use of facilities such as VLT and UKIRT.

For the immediate future, Canada has a strong investment in the TMT (first light planned for 2012), which is designed to perform well at infrared wavelengths, and to complement the James Webb Space Telescope. Although the site of the TMT has yet to be decided upon, it is likely to be one of either Hawaii, Mexico, or Chile.

Canada also has an important role in site-testing for future infrared observatories around the world. In particular a collaboration at the University of Lethbridge (with partial funding from NSERC and HIA) has developed an IR monitor called IRMA, which measures atmospheric water vapour emission at 20 μm. Three IRMA units are presently deployed by TMT for their site testing campaign, while another is at the Las Campanas Observatory for the GMT site testing campaign. A next generation unit with a more powerful cryocooler and larger mirror is currently being built for full-time use at the GMT. Another IRMA unit is currently undergoing a retrofit for cold temperature operations at Dome C Antarctica as part of the University of New South Wales' AASTINO site testing observatory.

Finally, there is another site-testing campaign (Project Leader: Eric Steinbring) underway to explore the possibility of an observatory in the mountains of the Canadian Arctic. The stable weather, dry conditions, and long hours of darkness in the winter months make polar regions particularly suitable for infrared observations, and satellite imagery has already suggested that parts of the the Canadian Arctic may be comparable in site quality to Dome C in Antarctica.

The table below summarizes the instrumentation and approximate sensitivities (where known) of existing and planned instrumentation on Canadian-owned telescopes.

Telescope	Location	Instrument	Wavelength Range (microns)	Point Source Sensitivity (1 hour, 5 sigma) (mJy)
ARCT	Alberta		0.8-2.4	
OMM	Quebec	SIMON	0.8-2.4	0.01-0.0259[1]
		CPAPIR	0.8-2.4	0.1-0.025
CFHT	Hawaii	WIRCAM	0.95-2.4	0.002
Gemini-N	Hawaii	NIRI	1-5	0.0007-0.2
		NIFS	0.95-2.4	0.026-0.879[2]
		Michelle	7-26	1.1-12
		TEXES	5-25	80-400
Gemini-S	Chile	GNIRS	0.9-5.5	0.024-0.49[2]
		Phoenix	1-5	2.6-6
		T-ReCs	8-26	1-15
		NICI	1-5	
		FLAMINGOS-2	0.95-2.4	
TMT[3]	Not in Canada	IRIS	0.8-2.5	
		IRMS	1-2.5	
		IRMOS	0.8-2.5	
		MIRES	4.5-28	
		PFI	0.8-2.5	
		NIRES	0.8-2.5	
		WIRC	0.8-2.5	

[1]Sensitivity ranges reflect wavelength dependence.
[2]Sensitivities of spectrographs are given per spectral pixel.
[3]TMT sensitivity is expected to be at least a factor 14 better than for the Gemini telescopes, and up to a factor 200 better for point sources.

2.4 OIRAC, the RAC, and a proposal for a CGBA:

In our June 2007 report we recommended that the CASCA board reconsider and redefine the mandate of its subcommittees OIRAC and RAC. In particular we made the recommendation that the Board consider the creation of a Committee for Ground Based Astronomy (CGBA), in full consultation with all CASCA committees.

We were informed that CASCA set up a subcommittee (Joncas and Hickson) to look into this issue, with the aim of developing recommendations for the Board to consider at it's fall meeting. OIRAC has been informed that this subcommittee has not yet (as of Nov 26) made progress on this issue, but expects a more fruitful winter term.

OIRAC suggested that we schedule a face to face meeting between OIRAC, RAC and the Board for the May AGM. This proposal was discussed during a Board telecon in Nov 2007, and apparently met with a positive response, provided that significant progress is made prior to the AGM.

3 Recommendations:

OIRAC repeats its recommendation from June 2007, that CASCA define its mandate for OIRAC and the RAC, and consider forming a Committee for Ground Based Astronomy. OIRAC looks forward to future participation with the subcommittee established to investigate this issue. We recommend that a face-to-face meeting be explicitly scheduled for the spring AGM.