

Report of the CASCA Ground-Based Astronomy Committee (GAC): June 2014 *(updated version including DRAO and CCAT: June 20, 2014)*

Membership and Activities

- Pauline Barmby, Western University (chair, 2012–15)
- John Hutchings, National Research Council (2009–14)
- Kristine Spekkens, Royal Military College (2011–14)
- Ludo van Waerbeke, University of British Columbia (2011–14)
- Laura Parker, McMaster University (2012–15)
- Craig Heinke, University of Alberta (2013–16)
- Erik Rosolowsky, University of Alberta (2013–16)
- Kenneth Tapping, National Research Council (continuing member, spectrum management)

The committee held a telecon in early May at which we (1) discussed “The Case for JCMT,” a report written by members of the Canadian submillimetre community who advocate continued Canadian participation in JCMT, (2) provided input to the Canadian Gemini Science advisory committee on whether Gemini is meeting expectations of the community and what its future directions should be, and (3) discussed an April meeting at the University of Toronto regarding large surveys with CFHT.

Facility reports

JCMT (E. Rosolowsky)

The JCMT remains operational under the current consortium agreement until September 30, 2014. The Canadian community has had its final call for proposals under the current framework, and the remainder of the time will be spent finishing the current PI science program and making as much progress as possible on the JCMT Legacy Surveys. After September, the UK Science and Technology Facilities Council (STFC) has arranged for control of the JCMT site to transfer to the University of Hawaii, enabling continued operations under a new consortium. Various parties have expressed interest in ongoing participation and a coalition led by the Academia Sinica Institute of Astronomy and Astrophysics (ASIAA) is being developed. The STFC is considering partnership in the new consortium.

The role of the Canadian community in the nascent coalition remains unclear. Members of the Canadian submillimetre community recently submitted a report entitled “The Case for the JCMT”

to the GAC and asked for commentary. Individual members of the Canadian community have received funding pledges from universities for ongoing participation in JCMT operations. NRC has clarified that it can provide no direct funding support for ongoing operations in the current situation.

ALMA (E. Rosolowsky)

ALMA continues operations in Cycle 1 of its Early Science with a transition to Cycle 2 expected this summer. The construction phase for ALMA is concluding imminently although significant systems integration work must still be completed before full science operations can commence. At the time of writing, 26% of Cycle 1 projects have been completed, and 57% of project have some data delivered. Owing to a low completion fraction, the top-rated Cycle 1 proposals will be carried over into Cycle 2. Cycle 2 proposal review has been completed; 76 individuals from 14 Canadian institutions participated in proposals. This is an increase of participation from Cycle 1 (55 individuals). There were 1381 proposals worldwide, of which 30 were submitted by Canadian PIs. Of these proposals, 5 projects were ranked high priority totalling 20.4 hours of 12-m array time or 1.3% of available array time globally (3.6% of North American time). Canadian scientists were co-investigators on projects that received an additional 9.6% of the available array time.

Gemini (C. Heinke)

Gemini-North returned to normal operations on Feb. 15 after a dome drive failure and repair; unfortunately there was another failure in a different drive unit on the dome on May 23 2014 and the telescope is expected to be off the sky for about 4 weeks. Three new instruments are functioning well on Gemini-South: Gemini Planet Imager (GPI) is observing Early Science programs, with normal programs starting in 2014B, while GeMS/GSAOI and Flamingos (imaging and long-slit spectroscopy modes) are observing regular programs. New GMOS Hamamatsu CCDs (with increased red sensitivity) are now being installed at Gemini-South. Innovative science results continue to be published (e.g., the farthest planet from its host star has been identified by the Montreal team; Naud et al. 2014, ApJ, 787, 5).

The GRACES link from Gemini-North to the CFHT EsPaDons spectrograph has obtained high efficiency (95% throughput) in initial testing. GRACES is targeting commissioning in the 2014B semester. A contract to build the next instrument, the Gemini High-Resolution Optical Spectrograph (GHOS), has now been approved, and the science team is being formed.

Two innovative new user programs are completing implementation. The Fast Turnaround Program is the Gemini Director's idea for monthly proposal calls, with each proposal reviewed by other PIs, enabling new ideas to get onto the sky quickly. This program was tested on a subset of CanTAC 2014B PIs who agreed to review each other's proposals, and will be compared with the results of the normal CanTAC process. If the program is approved by the Gemini STAC, this program will begin monthly calls for proposals in Jan. 2015.

The first Large and Long Programs TAC meeting has just concluded (including Canadian representatives Willott and Courteau), with an oversubscription rate of 3.5. The successful teams will

be expected to do some observing (generally using a new priority visitor mode, where the visitor executes the queue, with increased priority for their project).

CFHT (P. Barmby)

CFHT operations focus on the three main instruments WIRCAM, MegaCam, and EsPaDons, with healthy oversubscription rates from all communities including Canada. A project to install vents in the dome was completed in early 2014; there is not yet enough data to determine the effect on image quality. Development of new instruments SITELLE (Fourier transform spectrograph) and SPIRou (infrared spectropolarimeter) is ongoing. SITELLE acceptance testing is scheduled to take place in fall 2014; SPIRou passed its final design review in late May 2014. MegaCam is being upgraded with new, larger filters, both broad- and narrow-band. As discussed in the Gemini section, the GRACES project is going well; it will be up to Gemini to decide how to proceed.

Four existing Large Programs (BinaMIcS, MATLAS, MaTYSSE, and OSSOS) continue; they have been affected to differing degrees by the poor observing weather in semester 2013B. New Large Programs for 2015–16 were solicited in February 2014; the LP TAC has met and the Scientific Advisory Council has made a recommendation to the Board on program selection. At its most recent meeting in May 2014, the SAC began to consider possible mechanisms for very large surveys with CFHT as a means to maximize its scientific output. Community input on the decision process and format of the surveys is welcomed.

CFHT is 35 years old, and its future is under discussion. One possible future is the Maunakea Spectroscopic Explorer (MSE, formerly ngCFHT), which would reuse the dome and telescope pier but upgrade the telescope to a 10 m dedicated wide field spectroscopic telescope. An MSE project office was established in May 2014 and is tasked with generating a Construction Proposal over the next several years. The interim MSE Project Manager is Rick Murowinski and interim MSE Project Scientist is Alan McConnachie; searches are underway to fill these positions on a longer-term basis.

DAO (D. Bohlender)

Both DAO telescopes were oversubscribed in calendar year 2013. There were 32 proposals requesting a total of 399.5 nights for the 1.8-m telescope, or a subscription rate of 112% of the time available. 38 proposals requested 433 nights on the 1.2-m telescope, a subscription rate of 119%. Robotic operation of the 1.2-m telescope continues to be very popular and accounted for 65% of the scheduled time. While an exhaustive 2013 literature search has not been made, we know of 10 refereed publications based in whole or in part on DAO data and 14 conference proceedings and circulars.

Unfortunately in mid-September the 1.8-m telescopes 20+ year old Telescope Control System (TCS) computer suffered an irreparable failure. Plans had already been made to upgrade the TCS well in advance of the failure but with critical staff unavailable for 6 months the replacement of the old TCS with a new system took longer than we had hoped for with operation resuming in early December. By reviewing archived DAO Skycam images we estimate that approximately 310 clear observing hours were lost in the 83 nights the telescope was out of operation.

A lengthy project to upgrade the 1.8-m telescopes coating chamber was finally completed in

the spring of 2014 and the 1.8-m telescopes primary mirror received a long overdue new coat of aluminum in mid-May. A spare Cassegrain secondary mirror with a new enhanced aluminum coating was installed shortly thereafter. Because of commitments of NSI staff to other higher priority international instrumentation and telescope projects, scheduling time for primary mirror recoating of the DAO telescopes has not been easy. However the NSI long-term business plan now includes an annual commitment of staff for this work so we expect each telescope to receive fresh aluminum in alternating years in the future.

The focus of work on the Plaskett telescope will now be concentrated on completing efforts to enable robotic operation of the facility using lessons learned from automation of the 1.2-m telescope and high-resolution McKellar spectrograph. Work on the installation of new CCDs for the spectrographs of both telescope is also underway.

DRAO (A. Gray)

The Dominion Radio Astrophysical Observatory (DRAO) operates several observing facilities: the Synthesis Telescope (ST), a 7-element aperture synthesis array; the single-antenna 26-m Telescope; the 10.7cm solar radio flux monitor; and nearing completion is a “next-generation” solar radio flux monitor.

The ST is capable of simultaneous observations at 1420MHz and 408MHz. It offers wide-field continuum polarimetry and neutral hydrogen spectroscopy at the former frequency (1' resolution over a 2-degree field), and continuum total intensity only at the latter (3'' resolution over a 6-degree field). Telescope time is allocated via a competitive, peer-reviewed process, with deadlines at both equinoxes each year. Both short-term and long-term proposals are undertaken, with past projects ranging from targets of opportunity to surveys aimed at wide sky coverage or deep integrations. Although best-known for its work on Galactic ISM, in particular the Canadian Galactic Plane Survey (CGPS), the ST is also used for targets from solar system to nearby galaxies.

After a successful period of observations for the Galactic Magneto-Ionic Medium Survey (GMIMS), the DRAO 26-m Telescope is currently undergoing maintenance and refit procedures to embark on a survey to study Zeeman splitting. It is also used to support the CHIME pathfinder experiment being conducted at DRAO by a consortium led by UBC, and to provide short spacing information for ST HI observations. The telescope is open to external users via peer-reviewed proposals, but there are no proposal deadlines for this instrument, and the dominant use is long-term projects. The telescope has been used to observe from 408MHz to 6GHz, but the majority of experiments focus on neutral hydrogen spectroscopy at 1.4GHz.

Solar radio monitoring is also flourishing at DRAO, with the long-running Solar Radio Flux Monitor experiment - operated in partnership with NRCan, continuing to provide thrice-daily measurements of the 10.7cm radio flux to the space environment community. A “next-generation” instrument is under construction to provide measurements at additional wavelengths as well as high time-resolution spectrometry, and is expected to be operational in 2015. The solar monitors are not available for external use, as they are dedicated, single-purpose instruments.

NRAO facilities (K. Spekkens)

Access to the NRAO facilities JVLA, GBT and VLBA for Canadians through NRAO's open skies policy remains unchanged from the last GAC report. NSF funding levels for (Non-ALMA) NRAO facilities remains approximately constant despite the NSF Portfolio Review Committee's 2012 recommendation that the NSF divest itself from the GBT and the VLBI by 2017. NRAO is actively seeking partners to share the cost of VLBA and GBT operations; currently, 30% and 7% of observing time is reserved for these VLBA and GBT partners, respectively, reducing the time available for open skies by a corresponding fraction. It should be noted that the contract for the management of these facilities (currently awarded to Associated Universities, Inc [AUI]) will be re-competed in 2014. Clarity on the future of the GBT and VLBA may come after this re-competition has taken place.

CCAT (P. Barmby)

According to the April 2014 CCCT Newsletter, "CCAT is ready to commence construction!" The Chilean government has granted land access for both the access road and the telescope site. In March 2014 a proposal for telescope construction funding was submitted to the US National Science Foundation Mid-Scale Innovations Program in Astronomical Sciences, in the amount of \$US39.7M. A multi-institutional proposal to CFI from about a dozen universities will be submitted within the next few weeks; this would fund the Canadian share of construction costs.

CHIME (L. van Waerbeke)

Development of CHIME is going very well, with the final design review for the structure of the full instrument taking place on June 2, 2014.. The CHIME pathfinder which consists of two 40m long cylinders is in place and the site preparation for the full construction (five 100m long half cylinders) has begun. For the commissioning of the pathfinder, sky maps have been made to assess the sensitivity and angular responses. This involved measuring the response from known pulsars and performing holography with the DRAO 26m dish.