

LRPIC report to CASCA May 2012

The committee membership has evolved as follows:

James Graham replaced by Ingrid Stairs.

Rob Thacker to stay on for life (just kidding)

CSA observer now Alain Ouellet, (replacing Jean-Claude Piedboeuf, replacing Luc Brule).

GAC-chair observer is Tim Davidge (not-replacing John Hutchings).

The LRPIC has exchanged emails as issues arise, and this has been our principal means of progress. Those who are present at CASCA plan to meet at a lunch hour. The individual LRP projects that have received attention in the past months are listed below, with related narrative.

TMT/VLOT

We have followed the developments within the board and the project. TMT is now the only project responding to the NSF call for support proposals. This has not lessened the effort, and a thorough plan has been put forward. Much of the effort involved HIA staff, including editing the full submission to NSF. It is now proposed to develop a document that summarizes the construction plan for all partners to use in seeking funding support. It is clear that this year a major effort must get under way to meet the 2014 construction start date now proposed, and for Canada to remain in the partnership. The ACURA board plans to coordinate work via the Coalition and hold a workshop, probably early next year. John and Brian are on the ACURA-led 'TMT planning committee' which includes the Coalition, and who met by telecon this month. Serious lobbying will begin once the NSF decision is made later this year. Preparation and coordination are already under way, including the construction plan draft, to be distributed at this CASCA meeting.

Some LRPIC members met with Jon Dellandrea at the Perimeter Institute, to discuss private fundraising approaches, and we have been encouraged informally by CASCA to initiate such efforts this year. Working with SCURA and the Coalition is essential for any such effort, but it is viewed as a valuable potential complement to requests for Government funds. The share of observing time remains in discussion, but the Canadian share will be close to an equal fraction of the partnership of 6. The LRPIC continues to advise following TMT as the best option for VLOT partnership, as we may pass the 'deadline' suggested in the LRP for 'switching' to EELT. One potential complication is our membership in Gemini. The next 10-year agreement begins in 2016, but the 'assessment point' is November 2012.

SKA

In March, Canada became part of the international SKA organization, joining Australia, China, Italy, the United Kingdom, the Netherlands, New Zealand and South Africa. This gives Canada two representatives on the SKA Board (Russ Taylor and Greg Fahlman) and a vote in the site selection, which is expected to take place within the next few months.

On April 27th, a workshop was held at Calgary with nearly 50 representatives from Canadian industry as well as numerous government and university participants. The goal was to initiate a Canadian SKA Industry Consortium which will respond to the recently issued International Call for Expressions of Interest for SKA Pre-construction Work, and this consortium is now in the process of being formed. The consortium will also provide the industrial representation on the Canadian SKA Consortium Board.

Various proposals are also submitted and/or planned to carry on SKA-related work in the interested universities, building on recent NSERC SRO and CANARIE NEP-2 grants. The Canadian SKA Consortium Board intends to work with CASCA to re-establish the Canadian SKA Science Advisory Committee.

ngCFHT

The concept study under way, led by Patrick Cote at HIA will wrap up and report to the CFHT board later this year. The project has a wide base of scientific support, led by 10 working groups: 5 are led by Canadians, and 5 by French astronomers, totalling 58 in all. Workshops and meetings are planned, to follow up issues of design, performance, science, costs, and schedule. These will occur at CASCA, SPIE, and in Hawaii next spring.

The viability and cost estimates remain as reported a year ago, and the proposal continues to attract potential international partners. A notable development is the idea that the Japanese PFS could be designed to be modified and transferred to ngCFHT, as a substantial contribution from that partner. The timescale looks like 2022 for completion, which fits with such a PFS transfer. Visits between Canada and Japan are under way on this topic. The cost to Canada above continuing CFHT as-is, is in the range \$10-30m. The project involves many of the same partners, but the timescale and state of readiness are not compatible with TMT, so they need to proceed independently.

ngCFHT has risen in science priority and feasibility considerably since the LRP was drafted, but as anticipated in the LRP. ngCFHT involves many of the same partners as TMT, and will provide a unique dedicated multi-object spectroscopic capability to complement TMT. The project needs (of order \$2m) support to continue the Canadian design team work and activities, and liason with other partners.

Euclid

CSA concept studies were completed in March and we are negotiating details of a minor partnership in the mission. The essential CSA-funded elements of our minor participation are a momentum-compensating wheel (CMU), CADC involvement in data handling, and participation in project-wide science algorithm teams. To complement the Euclid survey database, access to PanSTARRS is wanted by the Euclid team as a high priority, and *our intent to pursue that* is required as part of the MOU with ESA, being worked now, and due in June this year – i.e. immediately.

The issue of PanSTARRS is an important new and actively developing consideration, as membership cannot be supported by CSA, beyond minor funds to support the required CADC involvement. PanSTARRS membership will offer considerable advantages within our Euclid participation, placing CADC in a key position within the two major databases of the mission, of significant benefit to both sides. It would also provide inside access to the PanSTARRS surveys for many other astronomical interests. There are some routes being explored to fund this, at the cost of a few million over several years. An initiative via an NSERC MRS proposal ended with cancellation of that program, but is being worked to apply to other possibilities, and the Euclid consortium recognizes that some time will be needed. LRPIC realizes the need to inform the community more widely once the details emerge, but generally views this as an excellent opportunity for LRP projects. Principally, we note that it is an essential ingredient of our participation in a dark-energy mission, the top LRP space astronomy project.

CST (CASTOR)

The CSA concept study for CASTOR is completed. The science and performance are very compelling and require follow-up design work. Partnership with other agencies is being pursued. CASTOR offers a major and superior addition to the Euclid database and science capability, as well as a wide range of other investigations. CASTOR would be a unique facility to provide HST-like resolution in the far-UV, after HST has ceased operations. It fulfils the LRP desire for a major mission in dark energy. Its full realization lies outside what the CSA budget may support at present, although the cost is similar to that of CSA's JWST instrumentation. Partnership with other space agencies on this is being sought actively, and already has international interest. CASTOR has the potential to become an icon of CSA, with considerable public interest.

JCMT and CCAT

An LRPIC representative attended Feb 17 meeting at the University of Toronto, to discuss the future of submillimetre astronomy in Canada. A key outcome of this meeting was the establishment of a working group (Tracy Webb, Scott Chapman and Norm Murray) charged with creating a science-driven, prioritized "roadmap" for submillimetre opportunities. These include short-term extension of JCMT involvement, longer term involvement through new instrumentation, CCAT, possible balloon-borne missions and, in the much longer term, SPICA. LRPIC would welcome a communication or report from this group.

Following the official end of SCUBA-2 commissioning in September 2011, the JCMT Legacy Surveys were rescoped to account for the lower-than-expected instrument performance. These surveys run until September 2014, which is when Canadian (and UK) funding for JCMT runs out. Netherlands will withdraw in March 2013. At the meeting in Toronto, there was considerable interest in extending Canadian JCMT involvement to 2016. A thorough science case for this extension was not presented, though it was noted that

access to only three years with SCUBA-2 limits what can be done. Oversubscription in the first year of SCUBA2 operation was 4, indicating strong demand. The JCMT director has submitted a paper to the UK Science Board requesting an extension of operations to March 31, 2016. A panel was set up to examine this and their report to the Science Board was received in April of 2012. The Science Board has agreed on a set of recommendations to STFC Council which will be considered by Council on 29 May 2012. If the UK does not extend their participation, then Canada will almost certainly have no choice but to follow suit. But if the UK extends their participation, then Canadian involvement could be continued at ~800k per year, perhaps less if operated in full survey mode. It was recognized that this funding will almost certainly not come via NRC, and thus alternative funding sources must be sought.

The CCAT project is now well into the final Engineering Design Phase (EDP) which will conclude with a Preliminary Design Review (PDR) in late June, 2013. Shortly after that, the first construction contracts will be issued. The Canadian Consortium has issued a contract for the enclosure design as part of the EDP, and several Canadian institutions have participated in the call for the design of first light instrumentation. It is expected that a request will be made to CFI in the next funding round (expected in early 2013) for the Canadian participation.

While CCAT is moving forward, it remains unclear whether it will be operated as a University facility like CSO, or as a national facility like JCMT. This can make a significant difference in how, and by whom, the facility is used, and perhaps also on the scientific productivity. Within Canada, it remains unclear how and where the CCAT consortium intersects the larger astronomical community. It was recognized at the meeting that the science case for CCAT is still in an early stage of development, and more work needs to be done on this front before a case can be made to make CCAT a national priority.

GEMINI

Our recommendation to continue participating in TMT, rather than considering ESO membership, has important implications for our involvement in Gemini. Nov 2012 is an assessment point, at which time Canada must state its intention regarding participation in the Gemini partnership after 2015. This next ten-year agreement is unlikely to overlap substantially with full TMT science operations. Gemini has undergone major changes in the past year, including a change in directorship, and the establishment of a STAC and a Gemini Users Committee (GSC). These changes potentially represent a positive change in the way science priorities are set over the next ten years. The signing of a new international agreement in 2015 may also be an opportunity to address any concerns with the governance or operation of the observatory. Gemini therefore remains Canada's flagship optical observatory, and we recommend a positive response to the assessment point. The withdrawal of the UK from the partnership actually opens possibilities for Canada to increase its share of Gemini with little or no additional cost. LRPIC will be prepared to issue a recommendation on this, which will depend in part on future

instrumentation possibilities and observing modes. Current issues related to future instrumentation are being assessed by the STAC and the GAC.

Astro-H

The CSA-supplied Astro-H metrology system is in progress, with normal minor technical and scientific issues. The engineering unit has been tested and will be delivered by the June 2012 need date. The flight unit is due in spring 2013. However, the contract is on hold as CSA resolve their current budget issues, and seek the proper approvals to move forward. JAXA can tolerate a small delay and work with the EU. The Canadian science team is engaged, and members attend meetings. This will be an excellent step towards a more major role in a future mission such as (son of) Athena. (Athena was not chosen by ESA in their recent selection, and we await further developments on that project.)

NSERC issues

LRP has been requested to consider feedback on the new NSERC evaluation procedure. This was an issue highlighted in the LRP report (pages 78-79 and recommendation 31), and affects all university-based astronomers. The recommendation asks that LRPIC look at how astronomy has fared under the new system, especially compared to other disciplines. At the same time it would be useful for LRPIC to wade in on the impact to astronomy of cancelling the MRS program.

LRPIC needs to review and discuss this matter further, so a conclusion will not appear in this report.

Space plan advisory committee

The current JCSA members plus the LRPIC chair are participating as an advisory group to the CSA Consultation document on the Space Exploration program plan. The draft plan provided is being worked with CSA towards a balanced, ambitious, but realistic plan that includes the LRP space astronomy priorities. Given the cuts to the already-inadequate CSA budget this year, the future needs work and patience. The committee is also tasked with setting (LRP) priorities on space projects for the decade.

The LRPIC, along with CASCA, sponsored letters last December to the CSA president and the federal government on the need for a more adequately supported agency and space astronomy program. They were signed by some 400 astronomers across the country. A response was received in early May from minister Paradis, long after the budget and associated cuts, but indicates that it has been read.