

JCSA Recommendations to CSA based on 2024 March 06 / March 13 meeting

Over the two 4-hour blocks of the meeting, the JCSA heard mission updates and reports from the CSA, CASCA, and NRC. The recommendations below are informed primarily by the mission presentations, along with the ensuing discussions. In some cases, recommendations from the previous JCSA meeting on June 9, 2023 are also included, as those had not been conveyed to the CSA.

(This list of recommendations is at present not prioritized, although the CSA has asked the JCSA to weigh in on prioritization. A more general discussion to produce longer-term recommendations is scheduled for June 3, before the CASCA AGM in Toronto. This would also be an appropriate time to discuss priorities.)

A. Mission recommendations.

A.1. On-going or approved missions:

1. JWST: *Canada is close to meeting its 5% share of allocated JWST time in the first 2 Cycles. Canadian-led JWST proposals have also had an above-average success rate.*
 - a. (also from June 9, 2023) Consider ways to help increase Canadian proposal pressure for JWST, in order to meet or exceed Canada's nominal 5% share of observing time. Possible options include:
 - i. raising the science support envelope; the 100% requested budget allocation in Cycle 2 was very welcome but was announced only after Cycle 3 proposals were already submitted.
 - ii. simplifying the grant award process (see suggestion below).
 - b. (from June 9, 2023) Further simplify the CSA Webb observers support grant process. This is felt as onerous following successful proposal for Webb observing time. JCSA recognizes that some application materials are needed. Consider allowing the original proposal to be submitted as an attachment and streamlining the additional application materials required. Criteria that encourage the budget evaluators to re-review the scientific merit of an approved JWST proposal should be eliminated.
As observer support granting schemes are consolidated, consider parallel simplification for other Observer support grants.
 - c. Provide public statistics on Canadian participation and success rates of proposals with Canadian PIs, Co-PIs, and Co-Is to inform on proposal and budgetary pressures.
2. XRISM:
 - a. Extend the current grant program specific to the Canadian SWG, as the GO program would be insufficient to support current research intensity and complete the preliminary verification studies to maximize XRISM science output.
 - b. Ensure that members of the Canadian SWG are allowed to seek GO funding.

3. AstroSat:
 - a. Consider options to extend mission life and support beyond FY24-25
 - b. Continue GO support, which has brought in record numbers of Canadian-led programs and new PIs in the latest Cycle (13).

4. Ariel: *there is at present very little participation from North America, which leaves an opportunity for Canada to increase its influence. Canada has unfilled (unfunded) seats on the Canadian Ariel Science team, which it has chosen to fill gradually.*
 - a. Consider ways to engage early-career Canadian astronomers (PDFs, junior faculty) to participate in Ariel, perhaps with some modest funding for travel to meetings. An important science gap is exoplanet spectroscopy expertise.

A.2. Future missions endorsed by LRP2020:

1. CASTOR: *In view of the current budgetary uncertainty at the CSA, the path forward for the mission unclear. Science and programmatic readiness are high and partners are willing to sign up. However, partners would lose faith if approval does not come soon.*
 - a. Secure approval of mission this budget cycle, aided by the push from the Coalition for Canadian Astronomy and positively received lobbying with MPs and ministries.
 - b. If above is not successful, ensure continued funding for mission development for CASTOR stays on track for 2030 launch, especially given the recent approval of NASA's UVEX mission.
 - c. Accordingly, expand or free personnel capacity within the CSA to support a fifth \$1B-scale mission: the only one for Astronomy.
 - d. Offer JCSA membership access to the UVEX-CASTOR comparison document compiled internally within the CSA.

2. LiteBIRD:
 - a. Ensure continued funding to maintain mission activities in Canada.
 - b. There is urgency in providing the Canada-built prototype of the readout system for testing, and an associated \$600k near-term funding need.

3. POET: *despite being a top new small-mission priority in LRP2020, POET support from the CSA is entering a pause. The team is turning to CFI for funding the mission in its entirety.*
 - a. Provide in-kind and cash support for the CFI proposal by contributing the already built prototype optics and paying for launch services.
 - b. Provide bridge funding for POET for FY24-25 to support the CFI request. This could be through an upcoming AO.

A.3. Other proposed missions:

1. LISA: *The mission formally adopted by ESA on Jan 25. Focus now is on finalizing and organizing partner contributions, including selection of science team. However, this opportunity is not yet open to Canada.*
 - a. Define a pathway to enable Canadian contributions, which could be through establishing a Canadian node to LISA's Distributed Data Processing Centre

(DDPC) over next five years. Canadian DPC could provide copy of data, software infrastructure, computing cycles; can leverage previous work done for LIGO-Virgo-KAGRA collaboration (e.g., distributed computing, job prioritization, data management)

- b. Support Canada's DDPC proposal through HQP and equipment funding to design and deploy DDPC infrastructure.
2. STARLITE:
 - a. Support development in $1e-10$ extreme-contrast imaging technology in Canada for direct exo-Earth detection. This would offer a much more accessible ground-based complement to HWO observations. Support would be via funding the development of a space-based laser beacon to enable extreme-contrast imaging with a ground-based telescope.
 3. HWO:
 - a. Continue to support Canadian science definition activities within the START program that will subsequently inform HWO mission design. This is timely and important, as the mission science definition is taking place over the coming 2 years.

B. General recommendations.

1. Push for a dedicated budget for Astronomy within the CSA, avoiding the need to seek federal government approval for any programs over a few \$M. Possible model to emulate is NRC's funding for ALMA, Gemini, CFHT, which are funded directly from the Treasury Board through the "International Observatories Contribution Program".
2. Improve transparency in CSA prioritization and competition processes, and include peer review feedback. The JCSA fully supports the Science Advisor to the CSA President in convening working groups and consultation committees of all science disciplines represented at CSA, in order to facilitate prioritization and budgeting.
3. Provide an update on CSA budgetary support for future missions endorsed in LRP2020 (A.2 above) at the June 3 JCSA meeting.

C. Other recommendations from June 9, 2023 JCSA meeting.

1. Reduce the allowed institutional overhead for CSA grants in general. The FAST grants have a 10% CAP and this standardizes the overhead taken by institutions. Without this cap the institutional default (as high as 40% for some institutions) may be difficult to revise at the individual PI level. 5% would be even better than 10% to ensure limited CSA funds are more directly allocated to the proposed work. JWST Cycle 2 grants already adopted the recommended 10% overhead.

2. CSA should encourage the BRITE data to be provided to CADC for archival hosting.
3. Provide intent of a CSA contribution to PRIMA so that Canada has a science return on the Canadian hardware already considered for PRIMA (currently NASA will buy from ABB with no science return).
4. Include JCSA / CASCA LRP consultation on the consolidation of the space astronomy topical team reports.
5. CSA should move towards a single grant process for observer support. This can be ~yearly (with perhaps some retroactivity allowed to mitigate time delays between observer schedules and granting schedule, and to also allow the funding to be competitive). JCSA recognizes the distinction between CSA-funded instrumentation observations and facilities that are not CSA-funded, and that the size and nature of Webb may require it to have a unique system. Even a 2-tiered system for CSA-funded/-unfunded is simpler than developing a unique structure for each facility, etc. Competitive funding is better than first-come first-serve given the timing differences between many different facilities. A balance between some support for everyone vs. sufficient support to be useful to successful applicants should be struck, with emphasis on proposals with well justified expenses.
6. The JCSA is fully supportive of the CSA's intent to further stimulate the development of astronomy and space science in Canada. The CSA can rely on enthusiastic support from CASCA and likely from ACURA and the RASC in seeking the requested funds from the government.
7. Make the content of the space astronomy CSEW topical teams public (executive summary is acceptable).