

## Joint Committee for Space Astronomy Report to CASCA

This report to CASCA covers JCSA activities for the period between May and December 2011. Roberto Abraham's term on the CSA ended in May, at which time Laura Ferrarese took over Dr. Abraham's duties as JCSA chair. Laura Parker was appointed to the CSA at the same time. The current JCSA is composed of Laura Ferrarese, Luigi Gallo, David Lafraniere, Brian McNamara, David Naylor and Laura Parker. Samir Boughaba, Luc Brulé, Jean Dupuis, Gregory Fahlman, Gilles Joncas, Denis Laurin and Gilles Leclerc are ex-officio members.

The most recent JCSA Meeting was held on Nov 17-18 2011 at the CSA Headquarters in Saint-Hubert, Quebec. Attending from the JCSA were Laura Ferrarese, Luigi Gallo, Brian McNamara, David Naylor and Laura Parker. Jean Dupuis, Denis Laurin, Gilles Leclerc, Genevieve Marchand, Eric Martin, Alain Ouellet and Michael Simkin represented the CSA. In addition, parts of the meeting were attended by René Doyon, John Hutchings, Steven Murray, David Schade and (by telecon) Roberto Abraham and Marcin Sawicki. Following the meeting, the JCSA submitted a series of detailed recommendations to the CSA. These are appended to this report, but have been edited from the original submitted to CSA by removing a few statements intended for CSA consumption only.

A few notable developments were presented at the meeting, as detailed in the attached recommendations. We will not repeat them in this report, but we do wish to add that uncertainties in JWST's future seem to have been resolved, and although investigations continue in the US and the project cost has been capped to 8.8 billion dollars, it now seems certain that the mission will go ahead. We were told that the CASCA petition sent on September 19 to the Honourable John P. Holdren in support of JWST was well received and played a role in securing the future of the telescope. In the week the petition was open, it was signed by 363 of the 497 CASCA members.

A source of great concern to the JCSA, which we wish to bring specifically to the attention of the CASCA Board and the Canadian astronomical community, is the dire financial situation the CSA, and in particular space astronomy related activities within the CSA, will find itself in the upcoming years. As detailed below, the consequences for the future of Canadian Space Astronomy are potentially extremely serious, and we urge the CASCA Board to take urgent steps to curtail the damage.

During the November JCSA meeting, the CSA did not disclose budget projections. However, such projections are detailed on the publicly available 2011-12 CSA Report on Plans and Priorities (RPP)<sup>1</sup>. The situation outlined in this document is potentially devastating for the future of the Canadian space astronomy program.

According to the RPP, the CSA budget is expected to decrease steadily from \$424.6M in 2011-2012 to \$317.5M in 2013-2014. The seriousness of this situation is further compounded by the internal reorganization of funds within CSA. Of the four "Program Activities" within CSA, three (Space Data, Information and Services; Future Canadian Space Capacity; and Internal Services) see virtually no change in the allocated funds between 2010 and 2014. Almost all of

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<sup>1</sup> <http://www.asc-csa.gc.ca/pdf/rpp-2011-eng.pdf> and <http://www.asc-csa.gc.ca/pdf/rpp-2011-details-eng.pdf>

the cuts are absorbed by the fourth program, Space Exploration. This is the program that funds (among other things) all activities related to space astronomy (such as JWST, Herschel, Planck, Astro-H, etc.). The budget for the Space Exploration program is projected to decrease from \$165M in 2010-2011 to \$88.8M by 2013-2014. Included in this allocation are \$48M of pre-allocated expenditures for the International Space Station (ISS). Once this is removed, the budget available for astronomy missions is effectively projected to decrease from the current ~\$120M to ~\$45M in 2013.

It is difficult to see how this funding can support the current level of space astronomy activities, let alone allow the new initiatives endorsed in the 2010 Long Range Plan for Canadian Astronomy.

The JCSA urges CASCA to notify the Canadian community of the situation, and organize a petition, along the lines of the one so efficiently and successfully organized for JWST, to lobby the CSA and Government for continued support for the space astronomy program.

On behalf of the JCSA,

A handwritten signature in cursive script, appearing to read 'Laura Ferrarese', followed by a horizontal line extending to the right.

Laura Ferrarese  
December 10, 2011

## **RECOMMENDATIONS TO CSA (edited version)**

### **Opening Remarks**

The JCSA Meeting was held on Nov 17-18 2011 at the CSA Headquarters in Saint-Hubert, Quebec. Attending from the JCSA were Laura Ferrarese, Luigi Gallo, Brian McNamara, David Naylor and Laura Parker. Jean Dupuis, Denis Laurin, Gilles Leclerc, Genevieve Marchand, Eric Martin, Alain Ouellet and Michael Simkin represented the CSA. In addition, parts of the meeting were attended by René Doyon, John Hutchings, Steven Murray, David Schade and (by telecon) Roberto Abraham and Marcin Sawicki.

The JCSA welcomes several positive initiatives and developments presented during this meeting. Moving forward with a concept study for a Canadian Space Telescope (CST) is viewed as a very worthwhile initiative that aligns the CSA with the recommendations of the 2010 Long Range Plan for Canadian Astronomy and builds on a great deal of effort the CSA and the community have invested since the 2009 Discipline Working Group exercise.

Problems with the performance of the JWST/TFI etalon have forced the TFI team to abandon the etalon design and reconfigure TFI. The redesigned instrument, renamed NIRISS (Near Infrared Imager and Slitless Spectrograph), now includes broad band imaging as well slitless spectroscopy. Although it is regrettable that such a drastic step had to be taken, this is a very welcome development given that the etalon problems could not be solved in a timely and satisfactory manner. The NIRISS PI and science team must be congratulated for redesigning the instrument with minimal impact to the original science goals. It is now imperative that the NIRISS team at the Université de Montreal (UdeM), the CSA and ComDev act quickly to resolve the extant problem with the dual wheel mechanism, a point to which we will return below (Section III).

The CSA is commended for their continuing commitment to SPICA and Astro-H. The JCSA hopes that the CSA Executive Committee will be able to expedite the funding process to allow for proper implementation of the risk reduction package for Astro-H's Engineering Development Unit before the February 2012 delivery date.

Finally, the JCSA notes that positive and unsolicited feedback was received from the community regarding the SSEP grants. The grants have greatly helped, and in some cases enabled the scientific exploitation of the missions with vested CSA interests. Continuing to offer these grants should be a top priority for the CSA, as they allow the community to benefit from multi-million dollar investments in space missions, at a very modest additional cost.

### **Detailed Issues and Recommendations.**

#### **I. Budget Outlook.**

The JCSA is deeply concerned about the anticipated cuts to CSA's Space Exploration budget and the effects this will have on current and future missions. The JCSA is very keen on working with the CSA and the PIs of the missions that might be affected to try to prioritize programs and minimize, as much as possible, the outfall of such cuts. The JCSA is also willing to work with the

CSA and advise CASCA to inform and consult the Canadian astronomical community about the consequence of the proposed budget cuts, and gather community support in lobbying for increase funding for space astronomy programs.

Budget projections were not available at the time of the meeting, preventing the JCSA from making detailed suggestions. However, we urge the CSA to implement the following

*Recommendations #1: as soon as possible after the Government's approval of next fiscal year's budget, JCSA recommends that all holders of grants/contracts that might be affected by the cuts are informed and asked to assess the situation and propose scenarios that would mitigate the damage. At the same time, a telecon between the JCSA and the CSA should be held, so that the JCSA is aware of the extent of the proposed cuts, and can work with the CSA and the PIs in prioritizing the allocation of funds.*

## **II. Canadian Participation in Euclid.**

The JCSA remains firm in its support of Canadian participation in ESA's Euclid mission. However, the JCSA is concerned that delays in issuing the RFPs to define the details of such participation might fatally compromise the prospect of Canada being able to join. The JCSA is receiving conflicting information from CSA and from the Euclid science advisory subcommittee regarding 1) the date by which CSA is expected to formally commit to the mission, and 2) the expectations of the Euclid Consortium regarding the ground segment work.

These discrepancies must be resolved. In particular, the Euclid science advisory subcommittee reports that all international participation in Euclid must be finalized by early summer of 2012, while CSA indicates that only a strong statement of interest is expected by that date. The consequence of misunderstanding ESA's expectations could be catastrophic and must be resolved. The CSA must assume a more proactive role in their interaction with the ESA Euclid Consortium.

*Recommendation #2: the JCSA recommends that the Euclid science advisory subcommittee (Hutchings/van Waerbeke/Carlberg) continues to act as a liason between CSA and the ESA Euclid Consortium. The subcommittee should continue to advise the CSA regarding priorities and steps that should be taken to ensure a Canadian collaboration in Euclid. An immediate task for the subcommittee is to resolve the discrepancy noted above regarding ESA's expectations for the date by which CSA must commit to Euclid.*

Although unable to discuss the content of the RFPs before release, the CSA indicates that, as a Government organization, the Canadian Astronomy Data Centre (CADDC) will be ineligible to respond to the RFP and receive funding from CSA to develop the ground segment for Euclid. While understanding the need for a competitive process (which the JCSA approves), the JCSA expresses disappointment in the fact that the CADDC, a recognized center of excellence for advanced data processing and archiving, is *a priori* excluded from the competition. This concern is further aggravated by the fact that the Euclid science advisory subcommittee and the CADDC lead, David Schade, indicate that the Euclid Consortium expressed reluctance in working with any organizations other than the CADDC, although the same strong signals were not received by the CSA.

*Recommendation #3: the JCSA recommends that the CSA explores possible ways to allow the CADC to participate in the competitive process for the award of the ground based segment contract for Euclid. If this is impossible, and no suitable proposals are received in response to the ground based segment RFP, the JCSA recommends that the CSA starts immediate negotiations with the CADC and moves quickly by amending the existing MOU with the CADC to include ground based support for Euclid.*

### **III. Canadian Participation in JWST**

The JCSA welcomes the increased involvement of UdeM and the NIRISS science team in testing the sub-systems of the new optical components. The continued failure of the NIRISS Dual Wheel (DW) Life Test Unit (LTU) to meet its expected performance is a source of concern and both CSA and ComDev must give highest priority to solving this issue.

The JCSA takes note of the fact that there is no CSA commitment to extend the contract of two of the NIRISS/FGS support personnel at STScI beyond the current expiration date of 2014. The JCSA reserves further recommendations on this issue until it has had a chance of reviewing the document being prepared by Alex Fullerton detailing the duties and proposed activities of each member of the STScI NIRISS/FGS team.

Finally, The JCSA shares the CSA view that NASA should be financially responsible for procuring new detectors for the FGS.

*Recommendation #4: given the increased workload the UdeM NIRISS team has assumed, JCSA strongly recommends that CSA continues to support the UdeM team at the current level for three year after the end of the current contract (March 31, 2012). This will allow to extend the positions of Mathilde Beaulieu and Loic Albert.*

### **IV. CSA Support of Space Missions.**

In reviewing the mission reports submitted for this and past meetings, JCSA is left with the clear impression that while CSA tends to be responsive and enthusiastic in enabling participation in future missions (Astro-H and SPICA are the latest examples), that enthusiasm diminishes once those missions move from planning to more advanced phases. It is not uncommon for PIs of on-going missions to express concerns over the level and/or uncertainty of funding (mostly to support HQP) during the immediate pre-launch, operational and post-operational phases of a mission. Yet, adequately supporting these later phases is critical to ensure the best return on the effort, time and money invested during the early phases. The JCSA wishes the CSA to move towards a “cradle to grave” *modus operandi* in which the same attention and support is bestowed to all phases of a mission. These include:

- Hardware and software development
- Operational support
- Post-operational support
- Data management, archival and processing
- Support for science operations
- Science exploitation (through, e.g., SSEP-like grants and funding for GO time awarded in open competitions).

Of course, not all these phases might be applicable to all missions, but the CSA should ensure that none is neglected as required by the project/collaboration.

In this context, data archiving/processing is a frequently reoccurring theme at JCSA meetings. This is an area in which Canadian Institutes and Universities have considerable expertise and yet, surprisingly, after HST and FUSE (both managed by the CADC) there have been no large-scale archiving/processing efforts for any of the major missions with Canadian contribution. To-date, there is no formal Canadian role in the archiving/processing of JWST data, in spite of the strong interest expressed by the CADC and the fact that it was the CADC that developed the JWST Common Archive Data Model adopted by STScI. The lack of a proper archive for MOST, the first Canadian led space astronomy satellite, is likely impacting the legacy value of the data. Likewise, no Canadian archive for AstroSat data is foreseen, despite the fact that there are still significant concerns over the quality of the data delivery and pipeline. In all of these cases, the CADC invested significant effort in developing and presenting proposals for proper archiving and data processing, however the CSA has been unable to secure a role for Canada in data archiving/processing. This is a missed opportunity and an inexcusable underutilization of Canadian expertise. CSA must actively pursue and resolve these issues.

*Recommendation #5: The JCSA urges the CSA to develop a coherent data management policy for space astronomy missions that enables efficient access to data and data products, thus ensuring that Canadian astronomers and the astronomical community at large are in a position to capitalize on the science potential of the missions.*

## **V. CSA Support of On-Going Missions: Specific Issues**

In this reporting period, concerns over funding necessary to perform various tasks related to operational activities were raised by the PIs of Herschel/SPIRE, Herschel/HIFI and Plank/LFI. Concerns over the level of funding to support pre-launch operations were voiced by the PIs of AstroSat/UVIT, JWST/NIRISS and Astro-H. The PIs of Spider, Herschel/HIFI and Plank/HFI stressed the need to maintain an adequate level of funding to support post-operation activities. The JCSA is supportive of these requests, which have been or will soon be formally submitted to the CSA by the mission PIs. Pending review of the applications, the CSA should consider funding these requests a high priority.

Specifically, beside the JWST/NIRISS case discussed in III, the JCSA wishes to draw attention to the current contracts that allow the hiring of 1) Joe Postma in support of flight hardware testing and calibration for UVIT, and 2) an FTE in support of data processing for Herschel/SPIRE. Both contracts expire in March 2012. The situation surrounding the contract to Blue Sky Spectroscopy Inc in support of data processing for Herschel/SPIRE (DAPSAS) is particularly troubling given that the end date of the existing contract is March 2013. Although contracts can be terminated early subject to availability of funding, understandably there was an implicit expectation that the contract would be honored up to that date.

*Recommendation #6: The JCSA strongly recommends the extension of the contract for Joe Postma until March 2013, i.e., at least a few months beyond the launch of AstroSat. Overall, CSA should act now to ensure that the mission is adequately supported until a few months beyond launch at the very least, with future funding pending a more detailed proposal from the AstroSat team.*

*Recommendation #7: The JCSA strongly recommends that the contract to Blue Sky Spectroscopy Inc. for Hershel/SPIRE be granted up to the original end date of March 2013, so that the project can be taken through its operation phase (further extensions should be submitted and approved as necessary). The JCSA believes that failure to restore the contract, which is necessary for the analysis and processing of the SPIRE data, will unacceptably diminish the legacy value of the instrument.*

## **VI. EBEX**

The EBEX Canadian PI, Matt Dobbs, expressed concerns that the reduced level of funding that is anticipated from NASA for the final year leading to EBEX's launch (expected in December 2012) will lead to the inability to hire an adequate number of HQP on the US side and will be very detrimental to the mission. EBEX is deemed to be of high scientific value, it breaks new ground in the development of digital readout systems for large arrays of TES bolometers and represents a pathfinder for future missions.

*Recommendation #8: The JCSA recommends that the CSA contacts, via email or phone, NASA to stress the importance for Canada's space astronomy program of seeing EBEX through to its science flight in Dec 2012 with adequate funding.*

## **VII. Future Missions Opportunities: WISH, WFXT, Athena.**

The JCSA wishes to thank Marcin Sawicki, Stephen Murray and Luigi Gallo for presenting the science case and mission design for, respectively, WISH (a concept for a JAXA mission for which a decision on whether to proceed to Phase A is expected in 2012/2013), the Wide-Field X-Ray Telescope Mission (a concept for the next NASA X-ray Astronomy mission submitted in response to NASA's September 12, 2011 Request for Information), and Athena (ESA's new X-ray mission concept, expected to go through the downselect process in February 2012).

The JCSA continues to welcome information on these missions. WFXT and Athena are of particular interest given their potential to fulfill the number one priority for "medium-sized" space-based facilities identified in the 2010 LRP.

*Recommendation #9: the JCSA recommends that the CSA contacts Stephen Murray and ESA expressing interest in WFXT and Athena, respectively, and asking to be kept informed of future developments.*

## **VIII. Mission Scientist Positions at CSA.**

The JCSA shares the CSA disappointment for the fact that the astronomer and planetary scientist positions the CSA was expected to advertise in the fall of 2011, and which were to include a 20-25% research component, have been put on hold waiting for the current budget situation to be resolved. The JCSA believes that the hiring, at CSA, of research scientists with strong scientific credentials is needed to strengthen the scientific component of the Agency and match the current engineering and managerial expertise. A strengthened scientific staff is also essential to allow a more streamlined and direct communication between the CSA and the scientists involved in the missions with which CSA has or is seeking collaborative agreements.

*Recommendation #10: the JCSA views the hiring, at CSA, of at least two mission scientists to be a priority. The scientific credentials of these scientists should be very high. The JCSA recommends that the hiring committee includes members selected within the CSA, the JCSA, as well as research scientists from the community. Additionally, specific astronomers identified as being particularly well suited for the position should be targeted directly and invited by the CSA to apply.*

### **Concluding remarks**

We wish to thank the CSA for organizing the meeting and for valuing the JCSA input. We also wish to thank Roberto Abraham, René Doyon, John Hutchings, Stephen Murray, Marcin Sawicki, David Schade and Alan Scott for participating during the meeting. The JCSA is composed of Samir Boughaba, Greg Fahlman, Laura Ferrarese (chair), Luigi Gallo, Gilles Joncas, David Lafraniere, Brian McNamara, David Naylor and Laura Parker.

On behalf of the JCSA,

A handwritten signature in cursive script, appearing to read 'Laura Ferrarese', followed by a horizontal line extending to the right.

Laura Ferrarese  
November 21, 2011