

The JCSA has met twice since the last CASCA board meeting. The first meeting was held at UBC immediately following the CASCA AGM and the second meeting was held at the CSA headquarters in St. Hubert in December 2013. The JCSA membership is currently:

Laura Parker (chair)  
Andrew Cumming  
Gary Hinshaw,  
David Lafrenière  
JJ Kavelaars  
Peter Martin

All of these members will continue for the next year, but we are currently in the process of identifying a new chair.

There have been a number of developments over the last year, which I will briefly summarize:

- 1) **CSA President:** The CSA has a new president (Aug 2013) who is currently coordinating a space policy for Canada which will be followed with extensive strategic planning. The CSA president has approached university and industry partners to aid in this strategic planning and a 'space conference' will take place at the CSA in February bringing together representatives from the CSA, academia, industry and funding agencies. The JCSA is asking astronomers to get in touch with their VPRs to help encourage them to attend this summit. In October I met with the new president along with John Hutchings. The president made it clear that no major projects will be funded until a balanced federal budget; however, he was enthusiastic about astronomy and the ability for astronomy projects to both stimulate industry and excite the public. The president's experience and presence in Ottawa and his leadership at the CSA has renewed enthusiasm among CSA staff.
- 2) **Emerson Report:** The Government has officially responded to the Emerson report on space. From this response, it appears that the CSA's budget will not increase until after an expected balanced budget in 2015/16, but the government announced that within that budget more funding will be allocated on technology development. This could be good for planning for future missions. New initiatives in the near future will need to be funded from outside of the baseline CSA budget. The other relevant recommendation of the Emerson report is the need for government agencies to work together more closely. At the recent JCSA meeting we heard that the CSA will respond this recommendation and the implications for astronomy are two-fold: 1) the government wants a list of priorities that are not separated into ground (NRC) and space (CSA), but simply in one ranked list, and 2) the CSA is planning to start discussions with funding agencies on the need to have project-based

funding for science available for CSA-funded missions.

- 3) **Current Missions:** Despite reduced budgets the CSA has managed to support all ongoing missions (MOST, JWST, Astrosat (UVIT), Astro-H, Herschel, Planck, NEOSat) including post-operations support for some missions. CSA has not identified funding for new missions at present except for small technology studies and (hopefully) one call per year for a Phase 0 mission study. The other avenue for funding missions at present is to consider balloon missions. The only grants program on offer is FAST, which is an HQP funding initiative to develop and fly balloon payloads. The CSA has also signed a deal with CNES resulting in a number of available balloon flights per year. PIs can use FAST to develop payloads and then fly them for free on CNES balloons. The challenge for astronomers is that the CNES flights are relatively short duration and do not support heavy payloads, two requirements for most astronomy balloon missions.
- 4) **Future Missions:** Without committed funding, plans for future missions are ongoing. The top LRP space-based priority in the coming decade remains joining a dark energy mission. The planned missions addressing dark energy questions (as well as many other science goals) include Euclid, WFIRST, CASTOR and WISH.
  - 1) **Euclid:** Despite enormous efforts by many individuals within Canada the possibilities for Canada to join the ESA-led mission Euclid have all been exhausted.
  - 2) **WFIRST** is NASA-led wide-field IR project which is expected to include international partnerships. A science definition team for WFIRST was recently struck by NASA, who invited the CSA to add a Canadian member. CSA issued a call and JCSA/CSA jointly held an evaluation and selected Mike Hudson to join the team. There were a number of very strong applications received which highlights the interest in the community for this mission.
  - 3) **CASTOR** is a proposed wide-field Canadian led UV-blue 1-m class space telescope. There was a mission concept study completed in 2012 and the CSA is currently supporting related detector technology studies. The cost of the CASTOR project is clearly beyond current CSA budgets and would require specific funding as well as international partnerships (including a launch partner). The next step for CASTOR is expected to be a Phase 0 study and there may be a call for such a study in 2014.
  - 4) **WISH** is JAXA-led wide-field near-IR mission to study high redshift galaxies. There is some potential for Canada to contribute hardware for this mission, which could be explored using CSA technology development funding.

It is clear that as part of the mid-term review Canada's space priorities will need to be re-evaluated and it will become important to define what would 'count' as participating in a dark energy mission if that remains the top priority.

In addition to dark energy missions, the JCSA is also closely following other missions as they develop, including SPICA (far-IR) and ATHENA+(X-ray). SPICA was initially a JAXA-led mission, but ESA is now expected to play a much larger role, which means that SPICA needs to be selected through the ESA M4 mission selection process. The selection process delays the expected launch date of SPICA to the second half of the 2020's. ATHENA+ is an ambitious ESA-led X-ray mission which could also launch at the end of the 2020's. ESA is planning to lead this mission with only small contributions from international partners, but it is possible that Canada could contribute some hardware.

- 1) **Mission Extension Reviews:** After JCSA recommendations, the CSA has implemented a Phase E mission extension review process. All missions (not only space astronomy) will undergo a standard review when they reach their initially planned lifetimes. This process was first applied in the fall of 2013 to the MOST mission (initial lifetime of 2 year, but has been flying for >10 years). The JCSA participated in the review by evaluating the scientific aspects of the mission, while the CSA lead the program portion of the evaluation. The result of this review should be known soon (results were expected at the end of 2013). It is anticipated that the JCSA will be involved in future mission reviews for space astronomy related projects.
- 2) **Committee Structure:** The CSA has recently restructured their external committees. In recent years the JCSA was the only active committee, but the goal is have a number of committees (JCSA, planetary exploration, human space flight, signature technology) in space exploration as well as a 'super-committee' consisting of the chairs of the four sub-committees. All of the committees are 'consultative' in nature rather than 'advisory'. This change in terminology is unlikely to change how the JCSA operates, the only significant change being that there are now co-chairs (one appointed by CASCA and one from the CSA [currently Denis Laurin]). The co-chairs set the agenda for the meeting and invite guests. The JCSA was concerned by the changes in the committee structure, but after our most recent meeting (nominally under the new structure) we are less concerned. It is important to monitor how the JCSA operates, but it appears that the committee will continue to run as it has in the past with reports including recommendations submitted to the CSA and reporting to the CASCA board. The JCSA is fundamentally different than the other CSA committees because it is joint with CASCA, and as such, any changes to how it operates should be approved by both the CSA and CASCA.
- 3) **Mid-term Review:** With budget reductions and a large number of current commitments, planning for future space missions has been difficult in recent years. The timing of the mid-term review is aligned well with the time scale of when the federal budget is expected to be balanced and we can imagine the

possibility of planning for an ambitious future mission. With that in mind, it is important for the community to get organized and have a clear up-to-date ranking of priorities. Space missions take 10+ years of planning and we know from experience that it is critical to get involved early in international projects in order to play a significant role. The JCSA would like to ask that space missions be explicitly discussed at the mid-term review session at the upcoming AGM in Quebec City.

**1) Science Exploitation:** A common theme in JCSA reports is the need for science funding associated with CSA missions. The return on major mission investments comes in the development of new technologies, support of Canadian industry as well as ground-breaking new scientific discoveries. In order to ensure the latter it is important to invest in science exploitation. There are a number of mechanisms possible to do this, including funding the science team through post-launch, having a grant program that funds post-doctoral researchers like the SSEP program, or having grant money available for PIs with successful observing proposals. NASA has a model where successful proposals are accompanied with money to exploit the data, and this is a model the JCSA has recommended for missions with open competition for observing time. Going forward the funding profile for missions should ideally include not only support for the science team, but also grants for users of mission data outside of the science team. This type of funding could potentially be granted in collaboration with NSERC.

On behalf of the JCSA,



Laura Parker

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