Report of LRPIC to CASCA, Nov 2012

The committee has followed the progress and status of all elements of the LRP, and Individual LRPIC members have been involved in many of them. As we are all aware, This is a time of fiscal restraint and uncertainty in moving forward in all large new initiatives, and this is the strong backdrop to the LRP progress. Nevertheless, we are happy to note significant progress in several aspects of the LRP.

We comment here principally on projects where there has been progress, where there are problems, and where we feel the situation has changed appreciably since the LRP was published. We have borne in mind that the LRP is intended to constitute a coordinated plan of complementary facilities, rather than simply a wish list in which goals may be achieved (or dropped) by a subset of LRP capabilities.

1. TMT remains the top priority of ground-based facilities. There has been steady political progress over the past year and the details are submitted separately. Two of the LRPIC are members of the `TMT planning committee', and we are involved in the lobbying effort under way with the federal government. The 20-page summary of the project which LRPIC initiated and led, has been used for this, and is now being mailed to all MPs. Several key meetings are in the works for the next few months, and the goal is still to have Canada a funded partner for construction start in 2014.

2. CFHT. The status of the CFHT and its future have changed significantly over the past year. We comment on two broad issues.
a) Long-term plans for the telescope and site.
b) Broad plan for use and instruments with the existing CFHT.

a) The ngCFHT concept has been developed with extensive documentation on the science cases, technical feasibility, and design. These have authorship from a number of potential partner communities, and have been formally submitted to the CFHT SAC and Board, this month. As it represents a major upgrade and a different resulting facility, the LRPIC wishes to endorse this as the best long-term possibility for Canada. We strongly encourage all parties concerned to develop the partnership and funding to make this possible. With the potential partnership, the cost to Canada should not be much more than continuing the current CFHT. We assume, and recommend, that Canada remains a major or equal partner in the ngCFHT.

While it represents a major change in focussing the capability on spectroscopy, we consider that it fits the trend towards specialized capabilities and time-sharing between telescopes that we see as the way of the future. It also involves several of the TMT partners, and represents a step towards the PRO concept. It is important to get this under

way in a timely fashion, to make the most of such a facility, working together with other LRP projects in a coordinated way, and as an excellent complement to facilities such as LSST, PanSTARRS, Euclid, and JWST.

b) We note that current new instrumentation plans for CFHT suffer from delays and demand-limitations, which adds impetus to moving ahead rapidly with ngCFHT. Accordingly, we do not recommend pursuing plans for new CFHT instruments until the long-term future is settled. (This does not include the new visitor instrument Sitelle, which is not in our purview). In this regard, we note that the recently-introduced idea of converting CFHT into a very wide-field imager is more than a new instrument, and would constitute a major delay in realizing any other CFHT capability, by inserting considerable downtime for the current telescope. We do not consider it within our mandate to discuss individual instrumentation plans that are currently in consideration, beyond the blanket statement here about them all. Current demand for existing instruments is strong and effective, and likely to remain so for a few more years.

3. We are pleased to learn that the CHIME project has been funded by CFI.

4. Space astronomy projects. Progress on existing commitments has been good, and we note that CSA plan to maintain support for those. These include JWST, UVIT, Astro-H. The news is not good for new starts that follow the LRP, as noted below.

a) Euclid. This represents the best current opportunity, in consultation with ESA, to join a dark-energy mission - the top priority for space-based facility. We have been chasing diminishing possibilities with ESA and the Euclid team for the past two years, and the last opening to join Euclid lies in enabling the optical wavelength surveys needed, via PanSTARRS. A co-ordinated plan and budget was developed, involving CSA, NRC (CADC), and Compute Canada, to enable this. The story is not yet over, but there are two major difficulties as of this month: PanSTARRS need for much more funding, and CSA's inability to support their part in the plan. (This situation is the driver behind the wide-field-imaging CFHT concept noted above as an alternative.)

b) CASTOR - the orbiting space telescope delivering 0.15" wide-field imaging in the blue and space-UV. The CSA-sponsored concept study is very attractive and has generated agency interest within the US, Europe, India, and Australia, as well as individuals from other countries. Potential partners are in discussion, but the essential requirement is CSA's plan to move ahead with it. CASTOR is designed to be the ideal provider of the Euclid survey noted above, as well as supporting wide-ranging legacy science and a PI program. CASTOR plus Euclid in fact form part of a coordinated LRP, replacing (and vastly improving upon), for example, the imaging capability of the present CFHT. While expensive, this project has wide appeal to potential partners as well as Canadian scientists, and we strongly

urge that this project be kept alive via intermediate studies by CSA contracts, and active soliciting of partners. We also note that a major partnership in this project is cheaper than our investment in JWST, and considerably cheaper than other major CSA projects.