

# NRC roles in facilitating participation in international telescopes

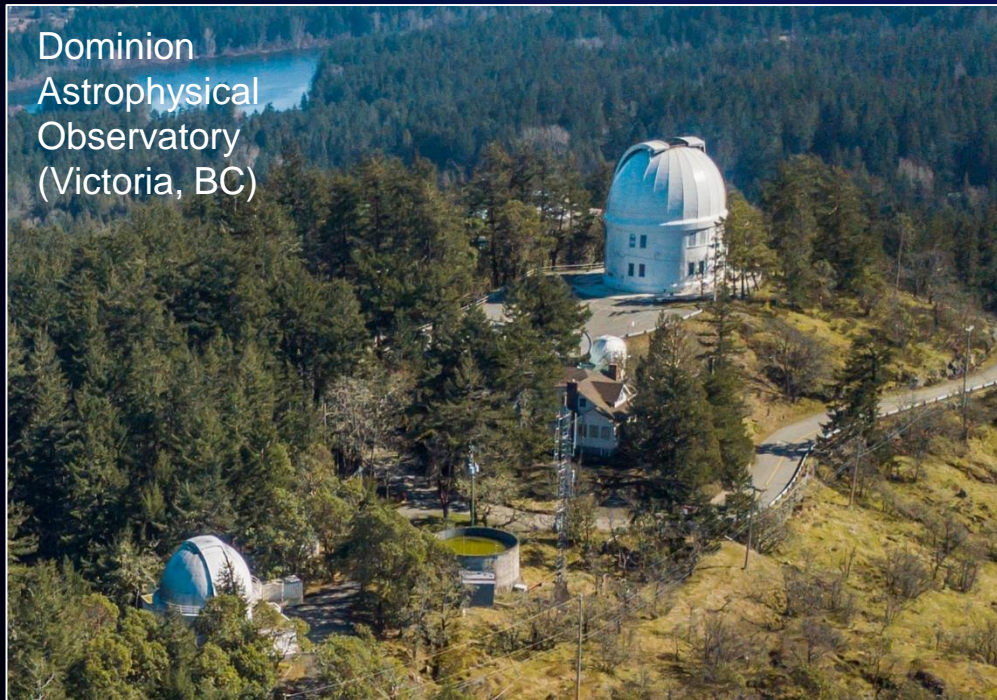
Canadian Neutron Initiative Roundtable – 15 December 2020

Luc Simard, Director General, Herzberg Astronomy and  
Astrophysics Research Centre

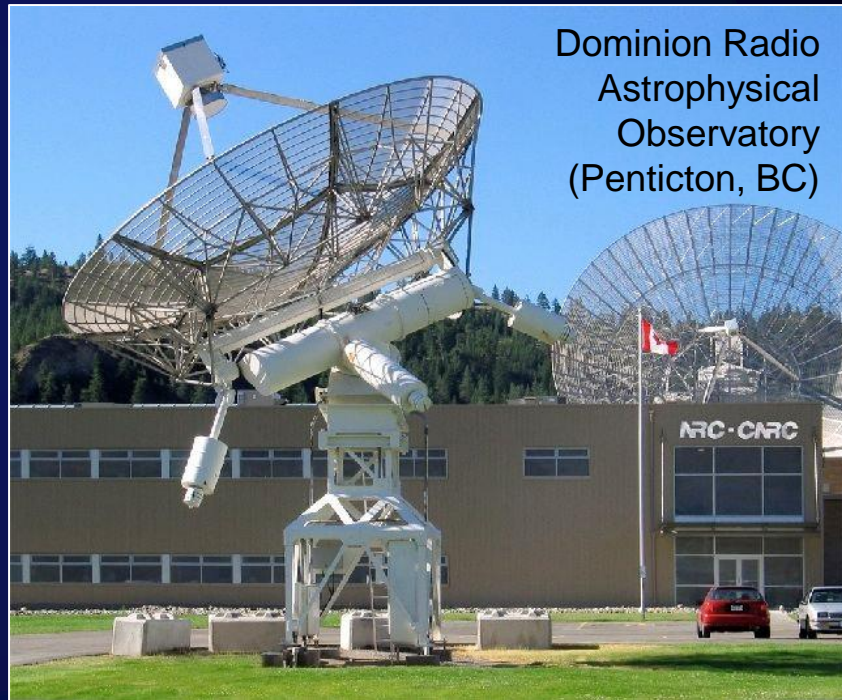


# Herzberg Astronomy & Astrophysics Research Centre

Dominion  
Astrophysical  
Observatory  
(Victoria, BC)



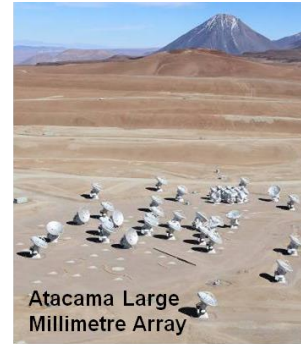
Dominion Radio  
Astrophysical  
Observatory  
(Penticton, BC)



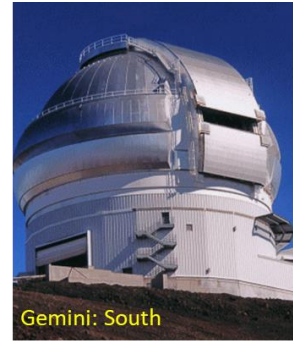
# NRC's Mandate for Astronomy

*NRC Act (R.S.C 1985, c. N-15): "To operate and administer any astronomical observatories established or maintained by the Government of Canada"*

- The mandate gives NRC a unique role within the practice of ground-based astronomy in Canada.
- NRC-HAA leverages global investments in excess of \$2B to provide Canadian astronomers access to world-leading observatories solely on the basis of the scientific merit of their proposed research as judged by unbiased peer review.
- The Mandate includes all phases: pre-construction, construction, operations and decommissioning.



Atacama Large  
Millimetre Array



Gemini: South



CFHT and Gemini North

# Current “Canadian” Family of Telescopes



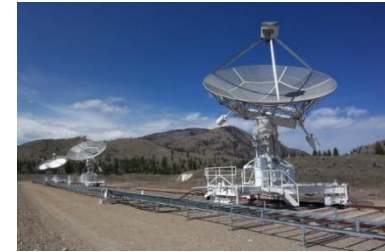
Plaskett, Victoria (1918)



McKellar, Victoria (1962)



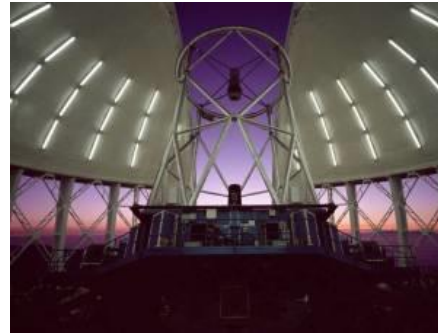
Galt, Penticton (1960)



Synthesis Telescope, Penticton (1995)



Canada-France-Hawaii,  
Hawai'i (1979)



Gemini, Hawai'i and Chile  
(1999, 2000)



CHIME, Penticton (2017 CFI\*)



Atacama Large Millimeter Array, Chile (2012)

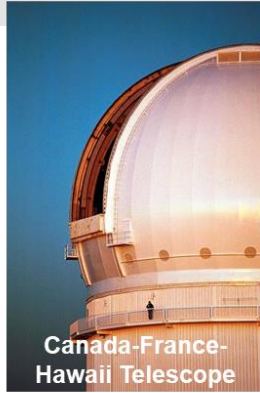
# Meeting the Challenges

- Leading scientists and engineers on staff
- Integrated labs on unique national sites
- Canadian Astronomy Data Centre – World-leading astronomy data services with big overlap in ocean sciences and other fields
  - Compute Canada, CANARIE and now the New Digital Research Infrastructure Organisation (NDRIO)
- Strong linkage with Canadian universities (ACURA, CASCA) and industry
- Extensive international presence (e.g., project leadership, science and technical steering committees) and reputation for delivering on commitments

# International Astronomical Observatories Program (IAOP)

- The International Astronomical Observatories Program (IAOP) was launched in 1978 and was established in light of Paragraph 5(1)(m) of the NRC Act
- NRC, in collaboration with other international bodies, provides financial contributions to support the management and operations of offshore ground-based observatories and their related facilities, including the Canada-France-Hawaii Telescope (CFHT), the twin telescopes of the Gemini Observatory, and the Atacama Large Millimeter Array (ALMA). NRC participates in the oversight and direction of these facilities and their research capabilities
- Through NRC's financial and in-kind contributions, the Canadian astronomy community is provided merit-based access to these facilities with appropriate financial and technical support.
  - NRC is the steward of Canadian telescope access
- Canada supports international partners in maintaining the facilities at competitive levels and, in doing so, seeks to address the technical problems in a way that allows Canadian industrial partners to capture the innovation inherent in new astronomical facilities and instruments for the benefit of their commercial interests and of Canada.

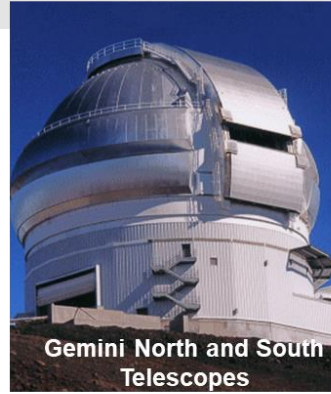
# Canada's International Observatories



Agreement: 1974

Canada	42.5%
France	42.5%
Hawaii	15.0%

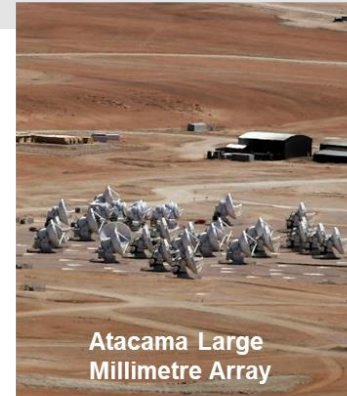
Locale: Hawaii  
Optical-InfraRed  
3.6m primary



1993

U.S.A.	67.24% (2018)
Canada	18.15%
Argentina	3.10%
Brazil	6.51%
Korea	5.00%

Hawaii + Chile  
Optical-InfraRed  
2 × 8m primary

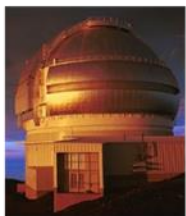


2003

N. America	37.5%
(Canada	2.8%)
Europe (ESO)	37.5%
Japan/Taiwan	25.0%

Chile  
Sub-millimetre array  
66 antennae

# International Telescopes: Deliverables



## Near Term

- Canadian astronomers have access to leading-edge facilities and technology.
- Qualified students have access to advance their training.
- New technologies are developed for new telescopes and instruments.
- Timely publication is facilitated by efficient management of telescope time and by timely availability of telescope data.
- Telescope data is effectively managed to help create and disseminate new knowledge.

## Intermediate

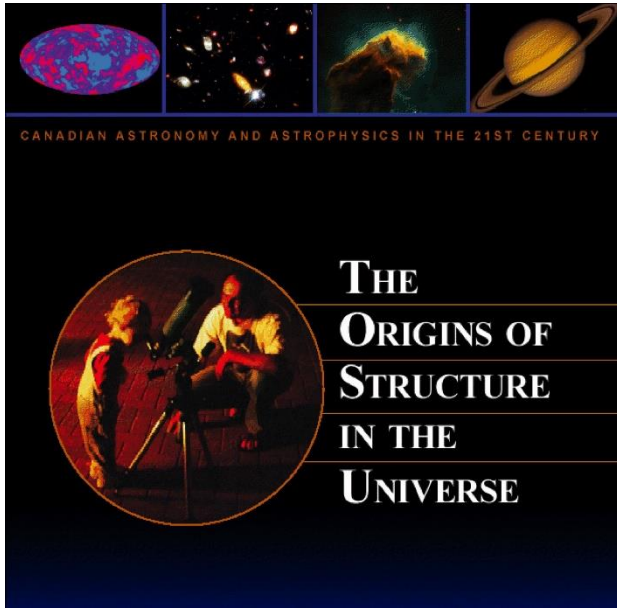
- Canada plays a prominent role in international science
- Scientific benefit to Canada is maximized through science conducted with leading-edge instrumentation.
- Canadian industry has increased opportunities to participate in advanced scientific projects and increased opportunities to benefit from contracts and technology development.
- New technology is transferred to industry.

## Long Term

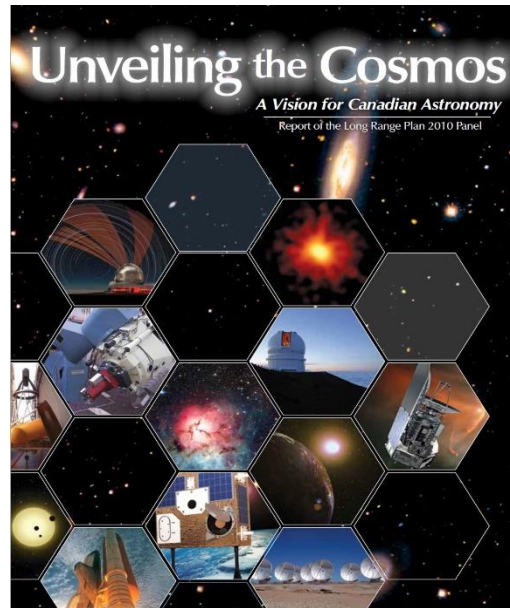
- Important knowledge is acquired about the universe.
- Canada's position is enhanced among the world's leaders in astronomy.
- Canadian industry is afforded the opportunity to become more globally competitive through the development of technologies related to international observatories.



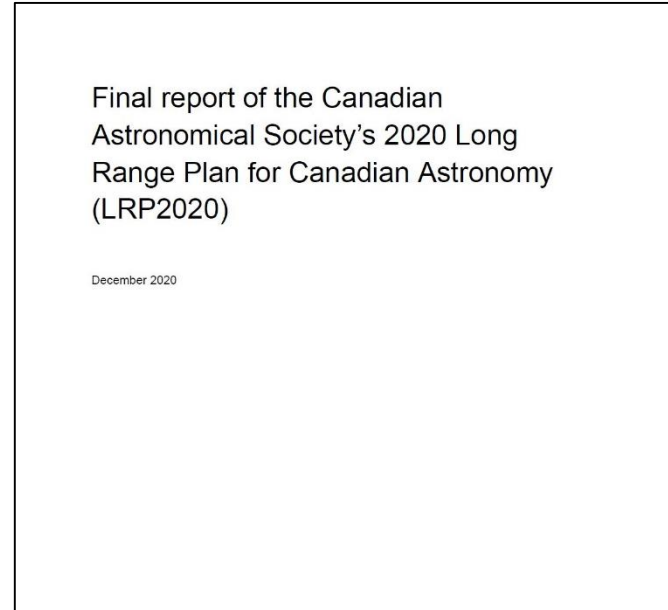
# The Long Range Plans for Canadian Astronomy



2000



2010



December 4, 2020!

# LRP2020 and NRC-HAA

- Final report released on December 4, 2020
- The LRP is the blueprint for HAA
- For HAA, this report means:
  - Update of our five-year Strategic Plan
  - Greater clarity on which large CFI-funded projects to support and precursor activities to pursue
  - Development of engagement strategies for LRP priorities including large projects such as the international Square Kilometre Array (SKA) telescope
  - Update of our International Telescopes Contribution Program

# THANK YOU

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