



## CANADA IN SPACE: THE FINAL FRONTIER

### THINGS TO PONDER:

- What new areas of exploration and technologies will drive the space sector in the years to come?
- How can Canada maintain current capabilities, and position our industry and research institutions for future success?
- How can we ensure that the exploration of space benefits all Canadians?

### SESSION PANELISTS

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### BACKGROUND

Space captures the imagination, and speaks to our desire to dream, explore, and discover. How did Canada get our start in space? Following the end of the Second World War, the Government of Canada embarked on a number of defence-related space projects. This culminated in the development of Black Brant sub-orbital rockets, first launched in 1961 (and still used today), and the launch of Aloutte 1 in 1962. With Aloutte 1, Canada became the third country in the world to build its own satellite. These milestones laid the groundwork for Canada's involvement in space.

Today, Canada's space activity cuts across academia, and public and private sectors. The Canadian Space Agency (CSA) leads Canada's public sector space activities. Its programs include the RADARSAT satellites, our astronaut program, and Canada's contribution to the International Space Station. The Department of National Defence, Public Services and Procurement Canada, and Innovation, Science and Economic Development Canada collaborate on military space projects.

Canada's private space sector is a growth industry. We are considered leaders in robotics, earth observation, space exploration, and satellite communications. Canada does not have a domestic launch capability, but we know our strengths. From 1997 to 2013, revenues for the overall sector grew by \$2.23 billion, or almost two thirds. Employment in the space sector in Canada is small, but includes a high percentage of skilled individuals in the science, technology, engineering, and math (STEM) fields. In 2013, the space sector in Canada employed 8,231 people (CSA State of the Canadian Space Sector, 2013). The work of those people generated \$3.94 billion in total revenues in 2013 (CSA State of Space Sector, 2013).



Academic research in Canada is a key driver of discovery and innovation related to space. Programs in astrology, astrobiology, astrophysics, earth and space sciences, and physics are offered at the University of Toronto, McMaster University, Queen's University, York University, University of Calgary, and others. Many other engineering and science programs are applicable to study of space.

Telecommunications, weather forecasting, climate data, search and rescue, and global trade, are all reliant on our capabilities in space. Our exploration of space has led to innovations in software engineering, advanced medicine, robotics, water purification, solar panels, environmental monitoring, and more. As we continue to explore the stars, there will be new discoveries that will shape our world in ways we cannot yet imagine. In our quest for the final frontier, who knows what we will think of next?

## SUGGESTED READING

Want to know more about the space sector in Canada and across the world? Check these out:

- Canada's Space Sector – Government of Canada  
<http://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/ad03933.html>
- Canadian Space Society  
<http://www.css.ca/>
- History Office - NASA  
<http://history.nasa.gov/>
- Publications – European Space Agency  
[http://www.esa.int/About\\_Us/ESA\\_Publications](http://www.esa.int/About_Us/ESA_Publications)
- Reaching Higher: Canada's Interests and Future in Space – Government of Canada  
[http://aerospacereview.ca/eic/site/060.nsf/vwapj/Space-e-online.pdf/\\$file/Space-e-online.pdf](http://aerospacereview.ca/eic/site/060.nsf/vwapj/Space-e-online.pdf/$file/Space-e-online.pdf)
- State of the Canadian Space Sector Reports – Canadian Space Agency  
<http://publications.gc.ca/site/eng/9.507039/publication.html>
- Students for the Exploration and Development of Space  
<https://seds.ca/>
- The New Space Race – Washington Post  
<https://www.washingtonpost.com/graphics/business/rockets/>

## REFERENCES

- Aloutte 1 and II – Canadian Space Agency  
<http://www.asc-csa.gc.ca/eng/satellites/alouette.asp>
- Defence & Discovery: Canada's Military Space Program, 1945–1974. Vancouver: University of British Columbia Press, 2011
- State of the Canadian Space Sector 1997 – Canadian Space Agency  
[http://publications.gc.ca/collections/collection\\_2012/asc-csa/ST96-8-1997-eng.pdf](http://publications.gc.ca/collections/collection_2012/asc-csa/ST96-8-1997-eng.pdf)
- State of the Canadian Space Sector 2013 – Canadian Space Agency  
<http://www.asc-csa.gc.ca/eng/publications/2013-state-canadian-space-sector.asp>