

SPACE CANUCKS

In the mid-1980s, the American space agency NASA showed its appreciation for the Canadarm by inviting a Canadian to join a future space shuttle mission. The time had finally come for us to have our own astronaut program.

The first Canadian astronauts were chosen more than 40 years ago. Before that, Canadians helped put Americans into space.

Canadian Space Agency



The exciting news came in 1983: The National Research Council (NRC) was looking for the country's first astronauts. More than 4,000 people hoping to head to space applied. The NRC chose these six.

1. Ken Money never flew; contributed to research on the effects of space travel on the human body

3. Steve MacLean *Columbia* 1992, *Atlantis* 2006. He later became head of the Canadian Space Agency

5. Robert Thirsk *Columbia* 1996, *Soyuz* rocket 2009 for a 188-day mission on the International Space Station (ISS)

2. Marc Garneau first Canadian in space, on the *Challenger* shuttle in October 1984, *Endeavour* 1996 and 2000

4. Bjarni Tryggvason *Discovery* 1997

6. Roberta Bondar first Canadian woman astronaut, *Discovery* 1992





In the second round of the program in 1992, the Canadian Space Agency (CSA) was in charge of selecting four astronauts from more than 5,300 applicants.

1. Chris Hadfield first Canadian to operate the Canadarm, *Atlantis* 1995; first Canadian to walk in

space, ISS 2001; first Canadian to command the ISS 2013

2. Michael McKay never flew

3. Dave Williams *Columbia* 1998, *Endeavour* 2007

4. Julie Payette first Canadian aboard the ISS, *Discovery* 1999, *Endeavour* 2009



David Saint-Jacques

After a year-long process, CSA chose two new people for the program in 2009 as some of the original astronauts retired or moved on to other things.

Jeremy Hansen: assigned to *Artemis II* mission around the moon planned for 2026

David Saint-Jacques: longest Canadian mission (204 days) on the ISS, 2018-2019

Besides being very healthy and fit, astronauts must

- ★ have a university degree in engineering or science, or be a medical doctor or dentist
- ★ be between 149.5 and 190.5 cm tall
- ★ weigh between 50 and 95 kg
- ★ have good hearing and eyesight

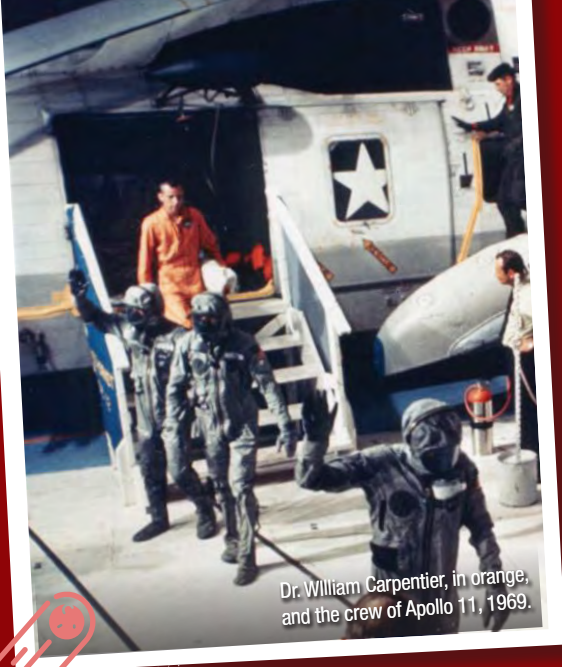
It also helps to speak more than one language and have other skills.



CSA selected two more astronauts in 2017.

Jenni Gibbons: assigned as the Canadian backup for *Artemis II*

Joshua Kutryk: will soon fly to the ISS



Dr. William Carpentier, in orange, and the crew of Apollo 11, 1969.

Doctor to the moon mission

William Carpentier was born in Edmonton and grew up in a logging camp on Vancouver Island. Qualified as both a pilot and a doctor, he caught the attention of NASA's new aerospace medicine program in the 1960s. As part of his training, he had to jump from a helicopter into the ocean to prepare him to help astronauts whose capsules had a splash landing. He earned a spot as the doctor for NASA's Apollo missions, including the first one that landed on the moon.

Canadian Space Agency, Canada Aviation and Space Museum • NASA



After the Arrow

It's been called the most advanced jet fighter in the world of its time. But in February 1959, with just six planes finished, the Canadian government cancelled the program to build the Avro Arrow. Within hours, NASA was calling; by April, it had scooped up nearly all of the key engineers who'd worked on the Arrow. Eventually there would be 32 people from the Canadian aircraft maker working at NASA. Jim Chamberlin was made head of engineering for Project Mercury, the first American spacecraft to carry a human. He also designed the Gemini spacecraft, which put the U.S. ahead in its space race with the Soviet Union. He even laid the foundations for the space shuttle program. Owen Maynard was rejected as an astronaut but hired as an engineer. Several other Avro folks were hired to work on NASA's projects to put an American in space. John Hodge was a flight director on the Mercury, Gemini and Apollo programs. Tec Roberts was an important part of the team that designed NASA Mission Control in Houston.



Canadian engineers **Farah Alibay** of Joliette, near Montreal (shown above), and **Raymond Francis** of Sudbury, Ont., both work in NASA's Jet Propulsion Laboratory.

PERSONAL PATCHES

NASA creates a special patch for the crew of a new mission. Canadian astronauts also each have a personal patch with special meaning.



Roberta Bondar, Mission STS-42

- Dr. Bondar's medical training
- Canada's partnership on the mission
- Sault Ste. Marie, Ont., where Bondar's from



Chris Hadfield, Expedition 34/35

- International Space Station
- Hadfield's three children and three trips to space
- water, which we must protect
- guitar pick shape — Hadfield became famous for playing his guitar on the ISS

Jeremy Hansen, Artemis II

Created by Anishinaabe artist Henry Guimond, Turtle Lodge, Sagkeeng First Nation, Hansen's patch recognizes Indigenous Peoples — the first explorers. It also reflects the time he has spent with Elders and Knowledge Keepers as he prepares for his mission.

- seven sides for the Seven Sacred Laws
- Artemis, goddess of the hunt, nature and the moon
- five-pointed star for Hansen's five family members and for Texas, where they live while he prepares



- seven animals, clockwise from bottom left — buffalo (bison): respect, eagle: love, bear: courage, Sabe or Sasquatch: honesty, beaver: wisdom, wolf: humility, turtle: truth

THROUGH AN ASTRONAUT'S EYES

David Saint-Jacques
took time to answer
some questions from
Kayak about what it's
like to be an astronaut.

What is something that might surprise people about what it's like to be in space, especially for as long as you were?

A lot of people have this idea of the lonely astronaut, but a space mission isn't like that. It's a very intense experience of group living and teamwork. Your crewmates become your brothers and sisters. The smaller the crew, the more intense the human experience.



What are some specific tasks or exercises you did to prepare for your time in space?

You go to astronaut school! If you're not a pilot, you have to learn to fly. I had to learn how to speak Russian and to fly the *Soyuz* rocket. You have to learn everything about the space suit and how to use Canadarm2. You have to learn all the emergency procedures — you're training yourself to be in constant danger.

Canadian Space Agency



What were some of your day-to-day responsibilities on the International Space Station?

About half our time is spent on maintenance. The space station is a giant life support system that's keeping you alive, so you have to constantly fix stuff! The rest of the time is spent doing science experiments, mostly on ourselves or colleagues. And we do two hours of exercise a day. It's the only way we can maintain our health when we're floating around for the other 22 hours a day.



Why is it important for Canada to have a space program and be part of space missions?

Just like we use highways and airports and the post office, we all use space every day. We call it our invisible infrastructure, where we develop things like satellites, recycling technology and energy management. Also, despite our differences, many countries are working together on the ISS. Space is like a bridge between those countries.



What was your most exciting moment as an astronaut?

Turning around and looking at where the Earth is, in the middle of absolutely nowhere. There's a lot of empty, quiet nowhere. We are living on this beautiful gem of a planet; everything else you can see is dead. The Earth is almost unbelievable. You never tire of that. With practical things, doing a spacewalk is a huge highlight. It's physically exhausting and mentally very taxing but overwhelmingly rewarding. And I was so proud to have been able to use Canadarm2.



What were some of the harder things?

The tough moments were missing my family, since my kids were really young. My wife was a genius at making it okay for them. On the other hand, on board, we spent a lot of time with crew members. Leaving the space station was hard. You want to go back home, but this might be the last time you're in space. And the gravity on Earth is crushing!