

Canada's
History
for KIDS
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Canada's History Magazine for Kids

Kayak

Space



JOHN CHAPMAN
LEADS THE WAY



OUT AMONG
THE STARS

COVER STORY

Canada Among the Stars

Our tech is famous

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Psst! These symbols spell Kayak in Inuktitut.



Cover illustration: David Nemisato

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FROM-THE-EDITOR



Canada's space program is respected around the world. Our inventions have changed space travel. Our scientists have made amazing things happen. Our astronauts have done us proud. Read on to learn how it all came to be and discover stories that reach out to the stars!

Nancy



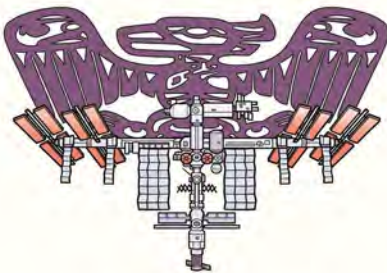
33,000 KG AMOUNT CANADARM CAN LIFT ON EARTH
266,000 KG AMOUNT CANADARM CAN LIFT IN SPACE



CANADIAN ASTRONAUT **JULIE PAYETTE** TOOK
 A LITTLE SQUEEZE BOTTLE OF **MAPLE SYRUP**
 WITH HER ON HER SPACE MISSION IN **1999**.

WHEN CANADIAN SPACE AGENCY
 ASTRONAUT **JEREMY HANSEN**
 LEAVES EARTH ON THE **ARTEMIS II**
 MISSION PLANNED FOR **2026**,
 CANADA WILL BECOME JUST THE
SECOND COUNTRY TO HAVE AN
 ASTRONAUT FLY AROUND THE **MOON**.

THE FIRST CANADIAN HARDWARE IN SPACE WAS A **COSMIC NOISE**
RECEIVER ON AN AMERICAN SATELLITE IN **1960**.



SEEN FROM ABOVE, THE
 INTERNATIONAL SPACE
 STATION LOOKS A LOT LIKE THE
THUNDERBIRD, AN IMPORTANT
 FIGURE IN MANY FIRST NATIONS.



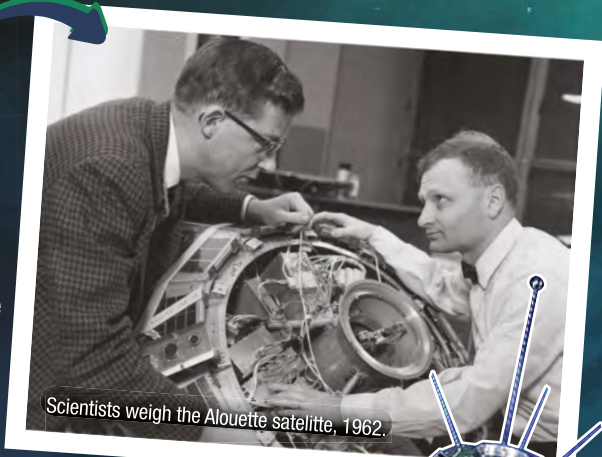
EACH OF THE THREE
 SATELLITES IN THE **RADARSAT**
 CONSTELLATION MISSION
 WEIGHS ABOUT THE SAME AS A
FULL-GROWN BULL MOOSE.

CANADA AMONG THE STARS

For more than 60 years, our tech has been an important part of space exploration. We count on it, but so do other countries and missions.

ALOUETTE

September 29, 1962, was a thrilling day. That's when the Canadian-designed and built Alouette satellite blasted off from California, carried on an American rocket. The launch made Canada the third nation in space after the United States and the Soviet Union (now Russia). Alouette took three and a half years to create. It studied the ionosphere, an outer layer around the Earth that bounces back radio waves for communication and navigation. The 145-kilogram satellite was only supposed to last a year, but it kept operating for a decade. It worked so well that three years later, its backup was made ready for space and launched as Alouette II.



Scientists weigh the Alouette satellite, 1962.



ISIS I AND II

The Canadian International Satellites for Ionospheric Studies (ISIS) satellites went up in 1969 and 1971. One of their goals was to figure out why the aurora borealis or northern lights, which occur in the ionosphere, messed up radio waves. Over 11 years, the ISIS satellites measured how changes in the sun's radiation affected the Earth's upper atmosphere. Their data helped Canadians become experts in taking and understanding images from space.

Many early Canadian space scientists did their research in the Prince Albert Radar Laboratory in Saskatchewan. To mark its first day, June 6, 1959, American President Dwight Eisenhower sent a special voice message to Prime Minister John Diefenbaker.



STORABLE TUBULAR EXTENDIBLE Member

The name of this antenna, invented by Canadian George Klein, shown above left, is usually shortened to STEM. Klein found a way to flatten and tightly roll up an antenna measuring 20 metres or more for the trip into space, where it could be unrolled again to its original shape. This valuable invention has travelled on Alouette, the first American space flights carrying humans, the Hubble Space Telescope, the Mars Pathfinder rover and more.

ANIK

In 1969, the federal government set up the company Telesat to provide Canadians with satellite communications — phone, television and radio signals. Three years later, Telesat launched Anik A1.

It was the world's first non-military communications satellite to sit in one place (called a geostationary orbit) over a country. Anik means "little brother" in Inuktitut. The satellite made it possible for people in Canada's Far North to watch live TV and have clearer long-distance phone conversations.

Some communities weren't sure they wanted shows from other places that might change their way of life. Using the Anik B, launched in 1978, Inuit producers created programs, some in Inuktitut, for home and school, but the Canadian government ended its funding in 1981. Telesat has been a private company since the government sold its portion in 1998.





Staff of the Alberta Native Communications Society are shown below in 1978. The Indigenous group was one of the first to make programs just for other Indigenous people and transmit them by satellite.

LUNAR LANDER

The famous American Apollo 11 spacecraft wouldn't have been able to plunk down on the moon in 1969 without landing gear designed and made by Quebec company Héroux (now Héroux-Devtek). In fact, all six moon landings set down on Héroux landing gear.



Launched in 1976, Hermes was the most powerful satellite ever built. It was the first to experiment with broadcasts sent directly to small stations on Earth. This photo shows Canadian and Peruvian diplomats in Lima, Peru, in 1978, getting ready to watch a hockey game broadcast this way.





This photo from April 28, 2001, shows something pretty amazing: two Canadian robotic arms “shaking hands” in space. Canadian Space Agency astronaut Chris Hadfield was at the controls.

CANADARM

In the early 1970s, the American National Aeronautics and Space Administration (NASA) was working on a new kind of spacecraft, the space shuttle. The NASA team realized they would need a giant robotic arm to unload the shuttle. A team of Canadian companies invented exactly what was needed. The Canadian government gave the arm to NASA, which used it in space for the first time on November 13, 1981. The Canadarm, as it was soon known, operated a lot like your arm does, swivelling at the shoulder, elbow and wrist. For 30 years, it moved cargo and astronauts who needed to fix equipment. It helped build the International Space Station (ISS). It even caught satellites and returned them to orbit after repairs. After 90 missions, the original Canadarm went out of service in 2011. The Canadarm2 launched in 2001 and is still at work in space on the ISS.



DEXTRE

This amazing robot, built by Canada's MacDonald, Dettwiler and Associates, can be attached to the ISS or operate at the end of Canadarm2. Since 2008, it's been installing and fixing things on the ISS, which gives astronauts more time to work on experiments. It has five cameras and a tool holster. Dextre can detect leaks of deadly gases and even fix itself.



Where can you find a Canadian astronaut, Canadarm2 and Dextre close to home? On the back of our five-dollar bill!



RADARSAT

Why launch three identical satellites? To keep track of what's happening with soil, ice, forests, lakes and oceans in Canada. The RADARSAT Constellation Mission (RCM), launched in 2019, does all that from about 600 kilometres above the Earth. It can scan our planet day or night, in any weather, to create amazing images that help us cope with climate change and watch for disasters.



ALL ABOARD

Many other countries' spacecraft use our tech. Here are just a few of the impressive Canadian inventions out there.

NASA's **OSIRIS-REx**, launched in 2016, used a Canadian instrument to gather information and map the asteroid Bennu. Our researchers get to work on a bit of the samples it sent back from the asteroid in 2023. The mission may help us understand more about how our solar system came to be.

There are two instruments built by Canadian company Honeywell on the powerful **James Webb Space Telescope**. One helps the telescope track, identify, point at and focus on the things operators want to take images of. The other helps study ancient galaxies and how they have changed over billions of years. NASA, the Canadian Space Agency and the European Space Agency work together on the telescope project.

Canadian instruments have ridden on the **Herschel Space Observatory** (launched in 2009), **Curiosity** Mars rover (2011), the **Swarm** observation satellite (2013) and many more.

CANADA FIRST

It's an exciting time for Canada in space. In the months ahead, a Canadian rover (shown below) will land on the south pole of the moon. The information it collects could help scientists learn whether there was ever ice made from water there. The rover will also analyze the moon's soil and try out new technology. Canadensys Aerospace is working with organizations from all over the world to build the rover.

**IN 2024, CANADIANS
VOTED FOR THE NAME
OF THE ROVER. WATCH
TO SEE WHICH CHOICE
WINS: ATHABASCA, POL-R,
COURAGE OR GLACIER.**



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!

CLOSER THAN YOU THINK

If you're interested in a career in space, or trying a space-related experiment for yourself, go for it!



SPACE SEEDS

The Tomatosphere™ program lets you and your classmates discover the impact of space travel on plants. Teachers who sign up get one set of tomato seeds that's been to the International Space Station or was exposed to the same conditions as on the ISS. The other set is regular seeds. Students plant both and compare how they grow. Part of the fun is that you only find out which seeds are which after your class sends off its results to Let's Talk Science, the organization that runs the free program. You can also take part in the Tomatosphere™ Adventure and find lots of other fun, free activities on the Canadian Space Agency website.



Let's Talk Science



STELLAR CAREERS

Besides astronauts, thousands of people in Canada have jobs connected to space. Gordon Osinski is a professor of earth sciences at Ontario's Western University. His expertise in geology on Earth led to an interest in geology on the moon. That in turn led to him being named the principal investigator of the upcoming Canadian-led lunar rover mission. He also trains astronauts in geology. "One of the things I really love about space is that you could have almost any background," Dr. Osinski says. The space program needs scientists, engineers and doctors, of course. But he adds that it's also important to have people to help understand the effects of long-term space travel on mental health and to think about what laws there will need to be in space. "We need artists to capture the journey, and music, too." If you're interested in anything from digital design and animation to astronomy, communication, robotics or photography, and you're excited about Canada's future in space, there are all kinds of careers to explore.

Some tips from the Canadian Space Agency for young people who want to work in this industry:

- ★ watch programs about space and visit exhibitions in museums and science centres
- ★ go to a space camp if there's one near you
- ★ read books and magazines about space, including science fiction
- ★ polish your English (it's the main language of space programs) and learn another language if you can. (Canadian astronauts speak English and French, and often Russian too!)
- ★ be prepared to study hard!



HEALTH ON EARTH

Written by Allyson Gulliver • Illustrated by Steven Hughes

**Near Tsiigehtchic, Northwest Territories,
Nov. 8, 2035**

“This might be a little chilly,” Dr. Khan said apologetically as she pressed her stethoscope to her young patient’s bare back.

Noah yelled. “Do you keep that thing in the fridge or what?”

Dr. Khan kept moving the metal disc around Noah’s back. “Take a deep breath,” she said, listening carefully. “And another.”

She lowered the arms of the stethoscope from her ears. “I don’t know exactly what it is yet,” she said to Noah and his dad, “but we’re going to find out soon.” She snapped open a grey case and pulled out a sleek machine about the size of a medium pizza box.

“So now you’re giving him video games to play?” Noah’s dad joked.

Dr. Khan looked at the screen of her tablet. “No such luck.” She turned to Noah. “Hold out your finger. You’re going to feel a poke.”

Noah winced as the little needle pierced his skin, but it was over instantly. “Is that it?”

“Almost,” the doctor said with a smile. “This part’s easier. Just spit into this little container. And please don’t miss!”

“What’s all this for, anyway?” Noah’s dad asked.

“This little machine will help us figure out what’s going on in his lungs.” She turned to Noah. “Not that

long ago, we’d have had to send you to Whitehorse or even all the way to Edmonton to get these tests done. Now I can collect the samples right here and get the results back later today.”

“Cool!” Noah said. “Although it would be pretty fun to go to Edmonton, too. That big mall sounds amazing!”

“Want to see something even more amazing?” Dr. Khan asked, holding up a black undershirt with silver dots here and there.

“Uh, it’s a shirt,” Noah said. “What’s the big deal?”

Dr. Khan smiled. “It’s not just a shirt. It’s a medical measurement and diagnostic device. We sometimes call it Double M Double D for short.”

Noah and his dad exchanged doubtful looks. “No, really!” the doctor laughed. “You wear it tonight and tomorrow. The whole time you have it on, the shirt will track a whole bunch of stuff — your heart rate, your breathing, how well you’re sleeping.”

“I wear it to bed?” Noah asked in surprise.

“Definitely,” Dr. Khan said. “You’re pretty lucky, Noah. All this high tech medical stuff means we can get some answers right here, and then decide what’s best for you. And if I don’t know, we can bring an expert in on a video call to help.”

“I hate coughing and being out of breath all the time,” Noah said. “My jijuu says I should eat more berries.”



"That's wise advice," Dr. Khan said. "Grandmothers know best, and berries are good for everybody. We'll see what else you need to help you breathe better and make your lungs stronger."

"Where did these doodads even come from?" Noah's dad was carefully turning the shirt over and peering inside it.

"Are you ready for this?" Dr. Khan asked. "Outer space!" Seeing their faces, she quickly added, "For real. Canadian astronauts tried out the shirt and the tester while they were on missions. I went to a presentation about it at our remote medicine conference. It's super-interesting."

Her face lit up as she explained. "When they're on the space station or headed to Mars, they can't just drop everything and go to a doctor's office or a medical lab. They have to figure it out for themselves. It's kind of like here — you can't exactly get these tests done down the street."

"Because there are no streets," Noah laughed. "Just gravel roads!"

Noah's dad was nodding. "And if these things work in space, they'll work for a doctor who has to travel around to see patients who live in tiny places like Tsiigetchic."

Dr. Khan nodded. "It's pretty amazing. Down south they're already connecting all these devices with artificial intelligence to find patterns doctors might miss."

"Careful, doc. You don't want the machines to replace you!" Noah's dad said with a grin.

Noah jumped down from the examining table. "Let's go, dad. I want to try out the Double MD shirt or whatever it's called."

Dr. Khan opened the office door. "I'll see you back here tomorrow afternoon," she said. "Sleep tight. Don't let the space bugs bite!" **K**



Think of this story as science fiction that's getting closer to reality all the time. All the tech we mentioned is already in use in space, like the Bio-Monitor. The Canadian Space Agency is now looking to develop tech that will help astronauts monitor their health and handle medical issues while they are far from Earth. Many of the same advances can help people here in Canada who live a long way from a big city hospital. Designed for space, the Connected Care Medical Module uses an artificial intelligence-based computer system. (It's known as C2M2; we made up the name Double M Double D.) These modules are already being tested with patients from Montreal to Whapmagoostui, Que., and in Sucker Creek, Alberta. Another amazing tool that started in space is the neuroArm. It's a robotic arm operated by remote control, using technology like what's behind Canadarm2 and Dextre. Instead of moving cargo in space, though, for nearly 20 years it's been helping surgeons perform incredibly precise operations that would be impossible otherwise. Astronauts on the International Space Station do all kinds of experiments, many of them related to human health. For instance, in space, people's bones weaken much faster. By studying what happens and ways to slow down this bone loss, astronauts can help people on Earth with the same condition, osteoporosis. And thanks to satellite communication, medical specialists can meet with doctors and patients who live almost anywhere.

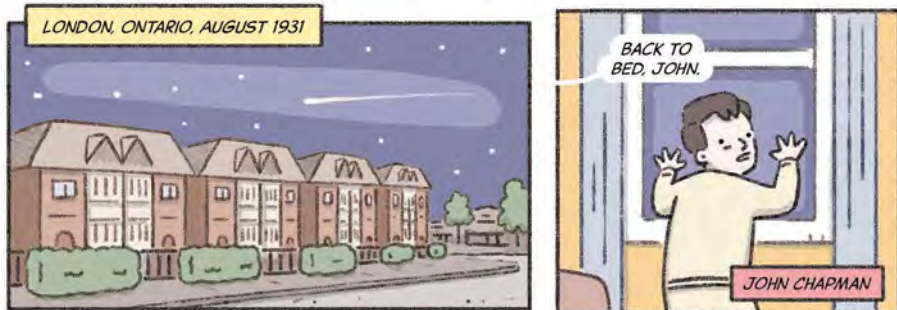
DREAMS *Beyond* EARTH

LONDON, ONTARIO, AUGUST 1931



BACK TO
BED, JOHN.

JOHN CHAPMAN



I WONDER...



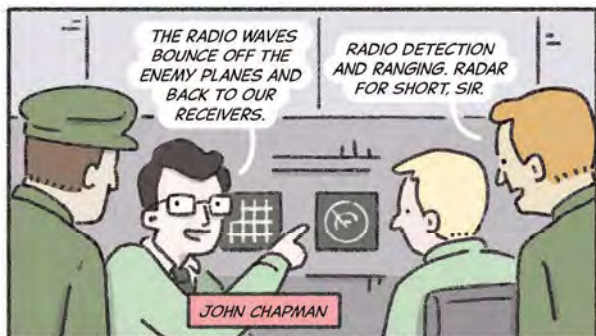
SOMEWHERE IN THE UNITED KINGDOM, 1942



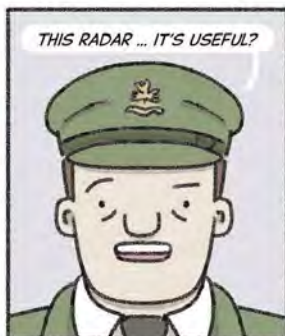
THE RADIO WAVES
BOUNCE OFF THE
ENEMY PLANES AND
BACK TO OUR
RECEIVERS.

RADIO DETECTION
AND RANGING. RADAR
FOR SHORT, SIR.

JOHN CHAPMAN



THIS RADAR ... IT'S USEFUL?



OH YES! WE CAN TELL WHERE THE PLANES
ARE AND WHERE THEY'RE GOING.



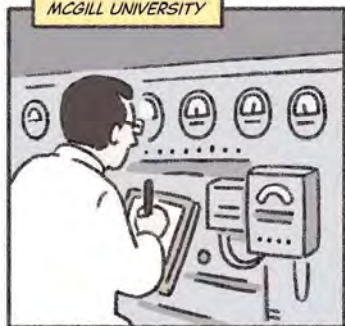
AND SOMEDAY,
I BELIEVE WE'LL
BE USING RADAR
FOR MUCH
MORE.



UNIVERSITY OF WESTERN ONTARIO



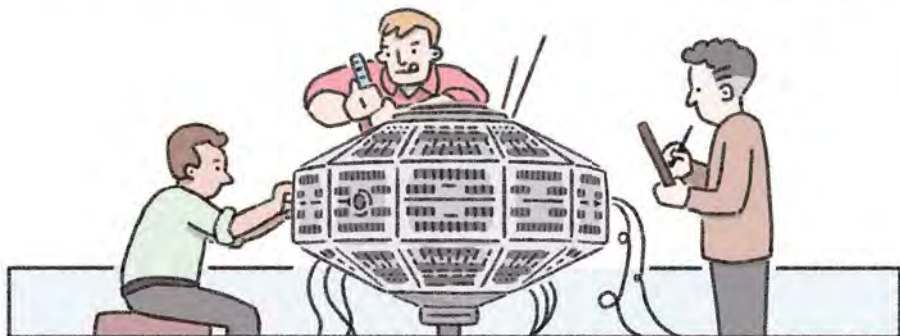
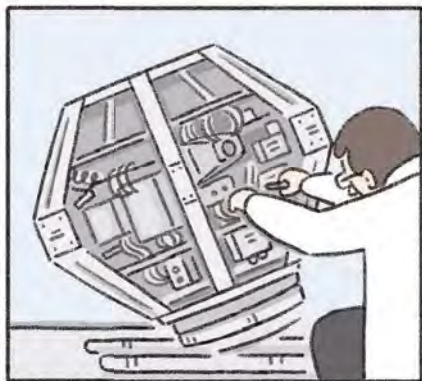
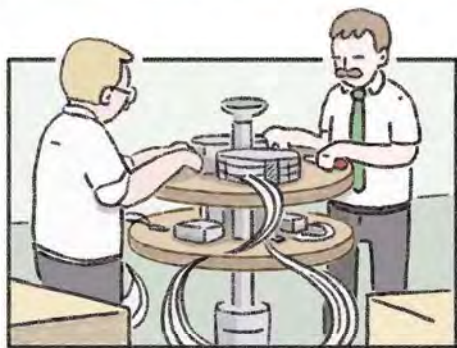
MCGILL UNIVERSITY

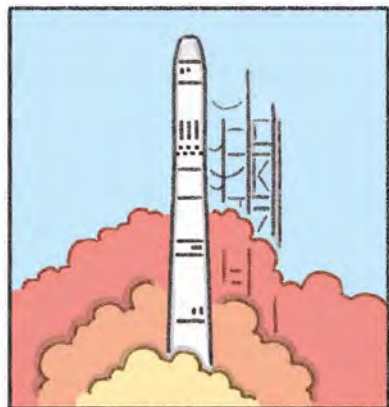
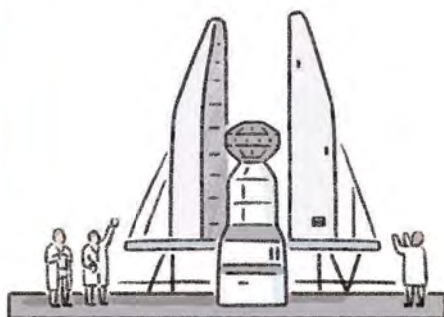


DEFENCE RESEARCH TELECOMMUNICATIONS ESTABLISHMENT
OFFICES, SHIRLEYS BAY, NEAR OTTAWA, OCT. 4, 1957



JAN. 31, 1958

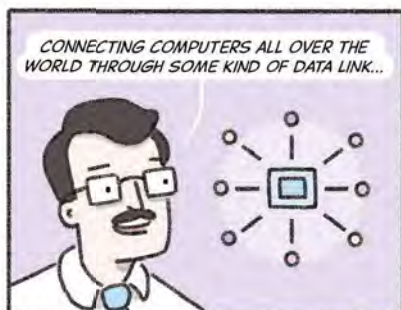




VANDENBERG AIR FORCE BASE, CALIFORNIA, SEPT. 29, 1962



MAKING IT EASIER TO TALK ON THE PHONE AND BROADCAST TELEVISION SIGNALS.



SCIENCE COUNCIL OF CANADA MEETING, JAN. 16, 1967



"FOR 100 YEARS, THE RAILWAYS HAVE BEEN UNDER GOVERNMENT CONTROL BECAUSE THEY WERE SO IMPORTANT TO LIFE IN CANADA. THERE SEEMS NO DOUBT THAT IN THE SECOND CENTURY OF CONFEDERATION, THE FABRIC OF CANADIAN SOCIETY WILL BE HELD TOGETHER BY STRANDS IN SPACE JUST AS STRONGLY AS THE RAILWAY AND TELEGRAPH HELD TOGETHER THE SCATTERED PROVINCES IN THE LAST CENTURY.

SINCE THIS IS SO, THE CRUCIAL ISSUE IS THE EXTENT TO WHICH CANADIANS WILL CONTROL THIS VITAL ELEMENT OF THEIR NATIONAL FABRIC. THE INFLUENCE OF SPACE TECHNOLOGY WILL BE FELT IN EVERY HOME IN CANADA. IT IS SO DIRECTLY RELATED TO THE NEEDS OF A LARGE, SPARSELY POPULATED COUNTRY THAT IT CANNOT BE IGNORED.

IT IS THEREFORE AN INESCAPABLE CONCLUSION THAT THE ELEMENTS OF SPACE TECHNOLOGY VITAL TO CANADA MUST BE UNDER CANADIAN CONTROL. WE CONSIDER THAT A CENTRAL AGENCY WITH RESPONSIBILITIES FOR SPACE RESEARCH AND DEVELOPMENT IS NECESSARY, AND WOULD RECOMMEND ITS ESTABLISHMENT."



CHAPMAN IS RIGHT. IT'S TIME TO TALK TO THE PEOPLE IN CHARGE!

I AGREE. CANADA MUST HAVE ITS OWN SPACE PROGRAM.

RESEARCHERS AT MY UNIVERSITY AND OTHERS ALL OVER THE COUNTRY ALREADY HAVE THE KNOWHOW.



FRANK DAVIES, DEFENCE RESEARCH TELECOMMUNICATIONS ESTABLISHMENT



DONALD ROSE, NATIONAL RESEARCH COUNCIL



BALFOUR CURRY, UNIVERSITY OF SASKATCHEWAN

IT TOOK UNTIL 1986 FOR CANADA TO DECIDE IT NEEDED A SPACE AGENCY LIKE THE ONE JOHN CHAPMAN AND HIS COLLEAGUES RECOMMENDED IN THEIR 1967 REPORT.

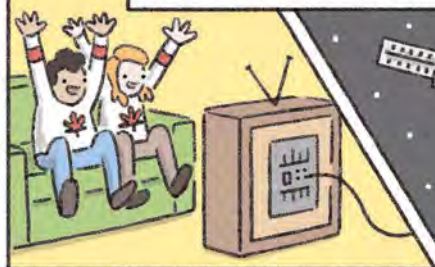


IT'S ESSENTIAL
FOR CANADA'S
FUTURE.



WHERE SHOULD THE
HEADQUARTERS BE?

FINALLY, IN 1990, THE GOVERNMENT CREATED THE CANADIAN SPACE AGENCY.



SOON AFTER JOHN CHAPMAN DIED IN 1979, HE WAS AWARDED THE MCNAUGHTON MEDAL. THE WORDING SAID IT WAS GIVEN "FOR HIS VISION AND LEADERSHIP IN RECOGNIZING THE POTENTIAL OF SATELLITES IN CANADA'S FUTURE UTILIZATION OF SPACE."

THE CANADIAN SPACE AGENCY'S HEADQUARTERS, LOCATED JUST SOUTH OF MONTREAL IN ST. HUBERT, IS NAMED THE JOHN H. CHAPMAN SPACE CENTRE.



MAYBE BEST OF ALL, THERE'S AN ASTEROID NAMED AFTER HIM.

Explore for Yourself

Learn about the past, present and future of Canada's role in space.

Canada Aviation and Space Museum, Ottawa

Find out more about Canada's astronauts, see some of their actual suits (including one worn by David Saint-Jacques) and learn what life is like on the International Space Station. You can see lots of the amazing tech you've read about in this issue, like a model of the Alouette satellite and a working model of the STEM antenna from 1962. There's also a cool model of Canadarm2 and Dextre with the Mobile Base System used on the ISS.



Cosmodome, Laval

Be part of a virtual space mission at this site just outside Montreal. Short films and games help you follow in the footsteps of the earliest space-goers or join an expedition heading for Mars. Check out an actual moon rock as part of the *Destination: Space* exhibition.

Science Centres

If there's a science centre near you, it likely has a section devoted to space. Spend some time in one, whether you're in Vernon, B.C., at the Okanagan Science Centre, or Science North in Sudbury, Ontario.





Star Shows

Many places in Canada have a planetarium, from St. John's to Winnipeg, Halifax to Jasper. A planetarium is a special domed theatre where shows are projected over your head. ObservEtoiles in Glen Sutton, Que., even has an augmented reality outdoor planetarium in the summer. If you love looking at the stars and planets, check out one of Canada's many observatories open to the public. Dark-sky preserves are special areas with little or no light pollution where you can get a great view just using binoculars. Canada has 13 of them — more than any other country.

H.R. MacMillan Space Centre, Vancouver

Take in an amazing show at the planetarium or learn how extreme environments on Earth help scientists prepare for missions to other planets. Discover our solar system and go to the Milky Way and beyond with Space Centre staff. See space objects with your own eyes in the observatory and wander through the Cosmic Courtyard.



ROVER FLEET
LUNA

Explore the surface of the moon in Rover Fleet Luna and learn about Cree constellations in Star Scribe. You'll find both games on the STEAM educational website amp.ca.



STAMPED INTO SPACE



In 1966, Canada put the Alouette II satellite on a postage stamp. Stamps are more than decorations; they also communicate. Governments use them to illustrate a country's values, promote its achievements and celebrate its culture. Why would Canada place a satellite on a stamp? What symbols do you see that suggest progress, science or national pride? What story is being told? Send your thoughts on what this stamp says about Canada's identity in space and science to CanadasHistory.ca/StampedIntoSpace to be entered into the Kayak contest!

KAYAK CONGRATS

Congratulations to Tabitha J., 10, from Yarmouth, N.S., for the winning entry in the April 2025 Kayak bicycles contest! Reflecting on a 1916 image of two sisters on a cycling trip, Tabitha wrote, "Biking was not a formal thing for women. It was something they could do independently and freely. It could take them to new places." Well said, Tabitha!

ANSWERS

HIDDEN PICTURES P. 32



TEACHER'S CORNER

You can find classroom material in both French and English to go with this issue of *Kayak*. Just visit CanadasHistory.ca/KayakSpace or HistoireCanada.ca/KayakEspace.



English



Français

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HIDDEN PICTURES



How sharp-eyed are you? See if you can find each of these objects or images in the comic **Dreams Beyond Earth** that starts on p. 22.