

Women in STEM


Bletchley Circle is a popular British miniseries that tells the incredibly important but untold story of women codebreakers during World War II. Hidden Figures was a best-selling book that became a hit Hollywood movie depicting the life and work of Black American women whose genius helped win the space race.


Canadian history has its own heroic women whose work in STEM made pivotal contributions to pivotal moments in developments over the past century. But Canadians have done a woeful job of telling those stories and making sure these women are celebrated.


Are Canadians aware that a young woman from Ontario travelled solo to Africa and became a leading zoologist years before Jane Goodall? Do we know the brains and brawn behind the Hawker Hurricane, a superb WWII fighter plane that was key to defeating Nazi aircraft in the skies over Europe, was a Canadian who also happened to be the world's first female aeronautical engineer? Role models play an important role in attracting girls and young women into STEM careers.


The underrepresentation of women in STEM plays out in real-life problems. Industrial tools and machines designed for the male body means unnecessary work-related injuries for female workers (Criado Perez, 2019). Medical research and pharmaceutical trials created by men for the male body, means women die unnecessarily of heart attacks or are prescribed the wrong dosages of medication (Criado Perez, 2019).


The nine Canadians included in this section are trailblazers in fields where men still disproportionately outnumber women. They have written reference books still used by zoologists, conducted space-based research that benefits Parkinson's patients, designed lasers that have allowed people to pitch their prescription eyeglasses and have won prestigious international science competitions. These are Canadian women whose lives and work warrant recognition and whose names must be commemorated.


Year	Name
1860-1880s	<p>Jennie Trout</p> <p>- Jennie Trout</p>  <p>Image: https://en.wikipedia.org/wiki/Jennie_Kidd_Trout</p> <p>Born 1841, in Scotland. Died, 1921, in California</p> <p>Daughter of farmers, her family moved to Ontario when she was six years old. 1860 - Went to 'normal school' and earned her teaching qualifications. This was one of the very few career options women had. She taught from 1861-1865.</p> <p>In 1869, Trout began the fight of being able to attend medical school. She and</p>

	<p>Emily Stowe were finally permitted into a one year 'qualifying' program in 1871. However, no school in Canada was allowing women into the MD programs. She faced discrimination and exclusion by professors and classmates.</p> <p>She moved to Philadelphia, Pennsylvania in order to study and earn her MD. In 1875 she moved home to Toronto and passed the examinations of the College of Physicians and Surgeons in Ontario.</p> <p>She was the first and only female doctor in Canada until Emily Stowe received her license in 1880.</p> <p>Heritage Minute https://www.youtube.com/watch?v=Q0I_P-euask</p>
	<p>Kate (Kathleen)Rice</p>  <p>Image : https://www.jeanwilsonmurray.com/kate-rice-pro prospector-pioneer-and-extraordinary-woman-of-the-wilds/</p> <p>1882-1963 Prospector, mathematician, teacher Born in 1882 in St. Marys, Ontario</p> <p>In 1902 she entered the University of Toronto with scholarships. She studied mathematics, physics and astronomy. She graduated in 1906.</p>

	<p>She conformed to social pressures and became a teacher but became extremely restless and unhappy. Soon, she quit her job and traveled northwest. Rice became a self-trained geologist, miner, hunter, trapper and canoeist.</p> <p>She heard of minerals being discovered in the north. She packed up alone and learned about prospecting. Kate eventually hired a crew of men to work for her. They blast and drill and eventually find copper, nickel and zinc.</p> <p>Because women were not considered 'persons' in Canadian law until 1929, all of Rice's business documents had to be signed by someone else.</p> <p>In 1960, Rice ended up in a Mental Institution. There are conflicting stories: one account had her checking herself in and the second account was that she was admitted by someone else. Regardless, she spent two months in hospital and was released – the doctor stating she was an 'unconventional woman, not insane'. She went to a nursing home where she died in 1963.</p>
<p>1890s-1970</p>	<p>Kirkina Mucko – Indigenous nurse – Labrador.</p>  <p>Image: https://en.wikipedia.org/wiki/Kirkina_Mucko</p> <p>Also known as Elizabeth Jefferies</p> <p>Born in Labrador in 1892. The winter of her second year, her mother fell ill and died in their small cabin. Kirkina's father was away trapping. Upon his return, he was forced to amputate Kirkina's legs because of frostbite and gangrene.</p> <p>Her father died a few days later.</p> <p>A doctor visited the area when she was four. He and his wife took Mucko to New York where she had multiple surgeries on her legs.</p> <p>She would end up travelling with the doctor and his family to the US, Mexico and Britain.</p>

	<p>She was fluent in Spanish.</p> <p>Despite being well educated and cared for by her 'adoptive' parents, Kirkina's name was changed and she was taken from her homeland.</p> <p>At the age of 23, Mucko returned to Labrador, got married and had seven children. In 1918, her husband and six of her children died of the Spanish Flu. Poverty stricken; she could not afford new artificial limbs. She would often hobble from home to home, nursing and midwifing across Labrador.</p> <p>After being without artificial limbs for almost three decades, a pilot donated money for Kirkina to be fitted with new prosthetics. She continued to serve her community and nurse until her death in 1970.</p>
<p>1930s - 1940s</p>	<p>Elsie MacGill – aeronautical engineer –</p>  <p><small>Image: https://www.umich.edu/~womenaeroastro/About_Elsie.html</small></p> <p>Born in 1905 in Vancouver, British Columbia</p> <p>She was a lover of the outdoors, of building and of fixing machines and appliances.</p> <p>In 1922 she attended University of British Columbia – but was kicked out by the Dean who didn't want a woman in his program.</p> <p>Elsie moved across the country to attend University of Toronto and in 1927 graduated with a BSC in electrical engineering.</p> <p>In 1929, she then moved to Michigan to earn a Master of Science. She became the first woman in the world to earn a degree in aeronautical engineering. On the eve of graduation, she contracted polio and was told she'd never walk again.</p> <p>After years of physical therapy and determination she proved the medical profession wrong, moved to Montreal and in 1938 became the Chief Aeronautical Engineer of Canadian Car and Foundry. Elsie was the head of production of the fighter plane The Hawker Hurricane – a plane that played an important role in</p>

	<p>WWII.</p> <p>After retiring from engineering, MacGill lobbied for the rights of women and children. She was a member of the Royal Commission of the Status of Women from 1967-1970.</p>
<p>1950s-70s</p>	<p>Anne Innes Dagg Zoologist, teacher, activist</p>  <p>Image: https://www.cbc.ca/radio/thecurrent/the-current-for-november-14-2018-1.4904602/how-a-canadian-giraffologist-stuck-her-neck-out-to-fight-sexism-in-academia-1.4904626</p> <p>Born in 1933</p> <p>1936 – was taken to the Chicago zoo by her mother, where she saw and fell in love with her first giraffe</p> <p>Earned a degree in biology and a Master of Science in genetics from University of Toronto</p> <p>After her Masters in Genetics, she applied to conduct research in Africa but was always rejected until she left her first name off of the letter of application and simply put A. Innis – concealing her gender.</p> <p>She wrote to a number of ranches to request a research position and was rejected until she concealed her gender by signing the forms with her initial and not her first name.</p> <p>At the age of 23 (5 years before Goodall) made a solo trip to South Africa. She was the first person in the world to study giraffes in the wild.</p> <p>1957 – returned to Canada, worked as an assistant professor at University of Waterloo and worked on her PhD.</p>

	<p>Went on to apply for a number of tenured professorships and was always turned down despite having written books and dozens of journal articles. She took legal action against a university on the grounds of gender discrimination and lost. Her book "The Giraffe: It's biology, behavior and ecology" is still referred to as 'The Bible' in giraffe zoology.</p> <p>In 2020 , at the age of 86 - the movie "The woman who loves giraffes" is released which has finally given Dr. Anne Dagg a sliver of the recognition she and her work deserves.</p>
<p>1960s- 1970s</p>	<p>Irene Uchida 1917-2013 Geneticist/Researcher/Teacher</p>  <p>Image: https://womeninstem.ingeniumcanada.org/portfolio-item/irene-2-ayako-uchida/</p> <p>Born Ayako Uchida in Vancouver, British Columbia in 1917. She was the daughter of immigrant Japanese parents. Her piano teacher couldn't pronounce her name and called her Irene.</p> <p>After high school, Uchida enrolled at University of British Columbia where she was very involved in rights for the Japanese. Before completing a degree, she decided to take two years to travel through Japan.</p> <p>In 1941, just after her arrival back home to Vancouver, she and her family were collected and interned in a camp in Northern BC. They were among 22,000 Japanese Canadians to be forced into internment camps for the duration of the war.</p> <p>While imprisoned, she opened a school and taught hundreds of students. After the war she moved to Toronto, worked as a seamstress in order to attend University of Toronto and complete her BA. Engrossed by her genetics courses, she went on to obtain a PhD in zoology in 1951.</p> <p>From 1951-1955 Irene worked at the Hospital for Sick Children where she conducted research on twins with heart defects.</p>

In 1960, the Children's Hospital in Winnipeg hired her as its director of medical genetics. She then moved onto McMaster University where she headed the genetics lab and taught.

She discovered the ability to detect genetic abnormalities by testing amniotic fluid. She also discovered the connections between x-ray exposure of pregnant women and the prevalence of Downs Syndrome.

Roberta Bondar
Neurologist/Researcher/Astronaut



Image: <https://www.sootoday.com/columns/remember-this/remember-this-25-years-ago-tomorrow-roberta-bondars-childhood-dream-came-true-516897>

Born in 1945 in Sault Sainte Marie, Ontario – On family camping trips, she'd look up at the stars and dream of traveling to space.

She was told by her high school guidance counsellor that girls shouldn't study math or science and that she'd never do well in math.



Graduated from University of Guelph with a degree in zoology and agriculture. Whilst a student in Guelph, she earned her pilot's licence (long before she got her driver's licence).

She went on to earn an M.Sc from Western University and a PhD from McMaster.

In 1983, Bondar was selected to be part of Canada's Space Team and in 1990 Roberta was selected as a payload specialist for the Discovery space shuttle. In 1992 Bondar became the first Canadian woman and the world's first neurologist in space. While onboard, she conducted over 40 advanced experiments for fourteen different countries.

After that she collaborated with NASA and headed an international space medicine research team.

1990s

	<p>Roberta has served as Chancellor at Trent University. She is an author, photographer, speaker and environmental activist.</p>
<p>2000-2020</p>	<p>Donna Strickland</p>  <p>Image: https://www.kitchenertoday.com/local-news/nobel-prize-winner-donna-strickland-returns-to-her-guelph-roots-1246100</p> <p>1959-</p> <p>Born in 1959 in Guelph, Ontario.</p> <p>She was told in high school that maths and sciences were boys' subjects.</p> <p>Strickland studied laser and electrooptics early and studied at McMaster University. The appeal to attend this school was because the program straddled physics and engineering</p> <p>Strickland knew she wanted to study lasers in her graduate work. In 1989 she earned her Ph.D. from University of Rochester, NY.</p> <p>It was in 1985 that Donna Strickland and her doctoral supervisor Gérard Mourou, succeeded in creating ultrashort high-intensity laser pulses without destroying the amplifying material. This work was why she was awarded the Nobel Prize for Physics in 2018 – (Only the third woman in the world and the first woman to be awarded the prize in 55 years.)</p> <p>Strickland was an Associate professor at the University of Waterloo when the prize was announced. She claimed she had never bothered to apply to become a full-time professor.</p> <p>Months before earning the Nobel, a contributor had tried to create a Wikipedia page about Donna Strickland and the request was denied by the moderator. Since the Nobel Prize, Donna has applied and earned the position of full-time faculty. Wikipedia has also permitted a page to be created.</p>
<p>2020</p>	<p>Maryam Tsegaye</p>  <p>Image: https://www.theglobeandmail.com/canada/article-alberta-teenager-wins-prestigious-international-science-competition/</p>

2003 -	<p>She was born in 2003. She lives in Fort McMurray, Alberta. Her parents immigrated from Ethiopia.</p> <p>With a lot of extra time at home thanks to restrictions that Covid-19 forced on to the world, Maryam turned to her love of science to help pass the time. (She explains that she is interested in science and science communication.)</p> <p>So, with a laptop that was held together with clips and a keyboard that only half-worked, she created storyboards, wrote, designed, shot and edited her three-minute video and sent it off to the international competition. She explains quantum tunneling using dice and music.</p> <p>She is the first Canadian to ever with the competition. She has been awarded over \$500,000 in prize money- for her future studies, her high school and for her science teacher.</p> <p>Maryam has been named one of the 2021 Top 25 Women of Influence. Tsegaye said she plans on studying overseas and is looking to finally buy a new laptop.</p>