

SPACE – AGED

Grey hairs are showing in the ranks of NASA's astronauts, but the agency says its crews aren't just getting older, they're getting better

By Elizabeth Howell

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When astronaut Steve MacLean steps into space from the shuttle Atlantis, he will go where no Canadian – over 50 – has ever gone before.

Performing a spacewalk is an extremely gruelling task for anyone, let alone a 50-year-old. Since there is no gravity to anchor him as he works on the International Space Station, Mr. Maclean will have to use his arms to brace himself as he turns wrenches and moves equipment.

His work, which will follow the launch of the shuttle from the Kennedy Space Center near Orlando, will extend over seven consecutive hours. Spacewalks were once seen as a young person's game but in the past decade, even astronauts in their late 50s have gone outside.

"The age makes it a little harder, probably," says Nadine Wielgopolski, Mr. MacLean's wife. "But he is in top shape and I have faith that he will do what he needs to do."

As the shuttle program winds down, Canadians can expect to see older astronauts from their country in space because the Canadian Space Agency (CSA) – that put calls out for astronauts in 1983 and 1992 – has no recruitment planned for the foreseeable future.

But NASA is not worried about its aging crews. Officials there say 50-year-olds – and even 60-year-olds – can be just as fit as those in their 30s. Chalk it up to another way the baby boomer generation is redefining expectations about what is possible.

"Because of healthy living, (boomers) are raising the age at which they are considered 'average,'" said David Foot, a University of Toronto professor who wrote about the boomer generation in *Boom, Bust and Echo*. "Some of that also is due to much better training for athletes and astronauts. They can extend their useful lives and occupations farther than in the past."

Marc Garneau, a Canadian boomer astronaut who has since retired, flew three times between 1984 and 2000. He was 51 during his last flight, but did not walk in space. He did say at the time that he used his experience to compensate for any physical slowdowns.

THE CANADIAN CREW

Julie Payette, 43
Chris Hadfield, 47
Steve MacLean, 51
Dafydd (Dave) Williams, 52
Bob Thirsk, 53
Bjarni Tryggvason, 60

GREY-HAIRED ASTRONAUTS

John Glenn - flew at 77 years old
Mr. Glenn was the first American to fly an orbital mission, which he did in 1962. After retiring from NASA and becoming a senator, he re-applied as an astronaut to study the effects of aging in space. He was accepted and flew on the shuttle in 1998 at age 77.

Mike Melville - 63 years old
When he was 63, Mr. Melville was the first pilot of a commercial spacecraft and was on the team that won the \$1-million X-Prize. He twice piloted SpaceShipOne, a suborbital spacecraft developed by entrepreneur Burt Rutan, in June 2004.

Story Musgrave - 61 years old
At age 58, he conducted three spacewalks to repair the Hubble Space Telescope in 1993. Mr. Musgrave, who was selected as an astronaut in 1967, waited nearly two decades for his first flight in 1983. He retired at age 61, in 1996, after flying six missions.

John Young - 61 years old
Selected as an astronaut at age 32, Mr. Young flew several Gemini and Apollo missions, including a lunar landing. In 1981, a 59-year-old Mr. Young commanded the first ever orbital space shuttle flight. His last flight was in 1983, when he was 61.

Marc Garneau - 51 years old
Mr. Garneau, Canada's oldest astronaut, flew three times in space between 1984 and 2000. At age 51, he was the first Canadian astronaut to operate the robotic arm Canadarm. He also served as an assistant to the commander and pilot during the landing.

In the end, he said, he was just as capable of performing his job as somebody 10 or 20 years younger.

"I was 16 years wiser and 16 years more knowledgeable because I put that time to good use in perfecting shuttle systems ... but at the same time, to be fair, I also slowed down in terms of my reactions," he said. "That's why we do so much training, to make sure we're able to react (to problems) quickly."

The boomer generation was in its childhood during the early days of the American space program in the late 1950s and early 1960s. At that time, NASA worried that older astronauts would not be able to react to space flight situations quickly enough, so it drew its first few astronauts from ranks of test pilots, who were renowned for their extreme physical fitness and mental quickness.

No one over 40 could apply for space duty, an age restriction that was later lifted in favour of selecting by physical fitness.

"Just think about the incredible unknowns about the stresses of space flight," said Andrew Chaikin, an American historian who penned *A Man on the Moon*, which chronicles the Apollo moon program.

"NASA was afraid that a human would not be able to function in space weightlessness ... so along with piloting skill and intelligence, superb physical condition was a requirement for space flight. That argued right away for younger people."

Some might argue, too, that spacecraft in those days also called for younger crews. Atlas and Titan rockets exerted immense gravitational forces on space crews during launch -- up to seven times what we experience on the ground.

In today's shuttles, which first flew in space in 1981, astronauts typically experience only three or four times the force of gravity during launch. On paper, it looks like a gentler ride for older astronauts, but Carleton University physics professor Robert Dick says the ride is equal in terms of physical challenge.

"Especially when the solid boosters are strapped on during launch, there are a lot of G-forces and a lot of extreme vibrations. It's just a matter of knowing what it does to your body, so it's a matter of selecting the right astronauts for the right traits. Those traits can be in older people as well as younger people."

Due to a combination of fewer shuttle flights and a standby crew of 100 qualified astronauts, recruitment efforts in Canada and the United States have slowed. Everyone had expected Canadians and other astronauts would fly more often, said Dwayne Ross, NASA's manager of astronaut candidates.

"When folks come to the astronaut program, some stay for one flight and leave. Some stay for two to three flights and some exceptional ones may stay for six," he said.

However, the Challenger shuttle accident in 1986 forced NASA to reduce the number of flights to meet safety concerns. Then, when the shuttle Columbia broke up over Texas in 2003, it halted the program and delayed the construction schedule of the International Space Station by three years.

The station can only take a crew of three until it is complete, at which point crews will expand to six members. If the shuttle flies the expected four flights a year between now and 2010, with a maximum capacity of seven astronauts per flight, there are at most 119 spots available.

"Just think about the incredible unknowns about the stresses of space flight."

Andrew Chaikin
Space historian

After the Columbia accident, the Canadian Space Agency, then under the leadership of Mr. Garneau, cancelled plans for a third recruitment campaign in 2004, because the current Canadian corps is enough for the remaining shuttle seats.

The average age of the six Canadian astronauts left is 51.

"The backlog actually exacerbates the problem for the Canadians because they have to wait in line," said Mike Bloomfield, a former astronaut who flew with Mr. Garneau on his second flight in 1996. "So the net result is the people who are waiting in line are waiting longer and they tend to be older. That's why Steve is flying later than he should have."

No one knows how long the current Canadian astronaut corps will keep flying. The current president of the CSA, Carole Lacombe, said astronauts are guaranteed flights until the space station is completed in 2010, but what happens after that is still under negotiation with NASA.

"We're looking at extended stays on the station ... and it would be contingent that the (construction) schedule continues as planned," said Ms. Lacombe. "That's why there's a lot of uncertainty."

Mr. Garneau says eventually we will need more astronauts to replace our aging corps, but he has every faith that Mr. MacLean will be able to do every task on the spacewalk as well as any younger astronaut.

"Steve has been thinking, breathing and living this mission for a long time," Mr. Garneau said. "He is ready for it. There is no question about it." ♦