

Martha's mission

She has already led a Mars simulation for NASA. Now this Waterloo native hopes to become Canada's next astronaut

As commander of HI-SEAS, which simulated life on Mars, Martha Lenio had to don a space helmet and suit whenever she went outside.

PHOTOGRAPHY • CASSANDRA KLOS



Martha Lenio grew up in Waterloo and studied mechanical engineering at the University of Waterloo.

PHOTOGRAPHY • TOMASZ ADAMSKI

BY BARBARA AGGERHOLM

Martha Lenio takes a good look at her answers in the application form that will help decide if she's to become Canada's next astronaut.

"It's pretty involved," she says. "I've been working on it a month."

On a warm, summer day, Lenio, a friendly, straightforward woman with an easy smile, is sitting in the living room of a friend's red-brick house in Kitchener that she's looking after, along with the cat, while her friend is away.

Her bicycle leans against the wall in the front hall, in the process of a tune-up after Lenio rode it to Guelph, 30 kilometres away, to Hillside Festival the day before. An autobiography she's reading, "Gloria Steinem: My Life on the Road" lies on the coffee table.

Lenio reads some of the application questions aloud: Engineering PhD, check. Scuba diving certification, yes – 27 dives, basic open water. Experience with high altitudes? Decompression sickness? "I have scuba diving training and I've hiked in the mountains in high altitudes," she says. "I know about the bends.

"I've got a lot of these (qualifications)," she says. "There are also ones I don't have.

"And I want to work on my French a bit. I go to conversation circles now occasionally in Waterloo."

Could Lenio be more passionate about the idea of space travel? Not likely. Lenio, whom friends and family call "Mars," "Aunt Mars" and "Dr. Mars," has reached for space since she was a child. She watched the stars and moon through a telescope at her family's Muskoka cottage. Growing up, she read the writings of famed theoretical physicist Stephen Hawking and watched Star Trek.

In 2008-09, when the Canadian Space Agency last recruited new astronauts, Lenio, born and raised in Waterloo, oldest of five children, University of Waterloo mechanical engineering graduate, founder of the

Waterloo Space Society, made it to the second round before she was cut. She was in Australia then, finishing her PhD at the University of New South Wales.

In 2013, she was filling out another application, this time to be part of the Mars One mission, a privately funded one-way trip to Mars, when she discovered it would involve a reality TV production. She didn't like the idea and didn't complete the application.

"I was maybe OK with one-way; my Mom wasn't," she says. "I'd prefer to come back," she adds. "I do like Earth and I'd like to share the experience with people."

This time, when the Canadian Space Agency is looking for two candidates – only the fourth time it has searched for what it calls the "next generation of space explorers" – Lenio, 36, is even more prepared, more experienced, more knowledgeable.

Last year, Lenio came closest to her goal yet when she was chosen to be commander of the NASA-funded Mars analog mission called HI-SEAS, or Hawaii Space Exploration Analog and Simulation.

"She phoned to tell us she'll be part of the mission in the dome and not only that, she'll be mission commander. We all looked at each other. Martha will go for something and she surprises us all," says her mother, Mary Anne Lenio.

"My husband used to call her 'Charmed Martha.' We called her 'Dr. Charmed Martha' when she graduated."

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For eight straight months ending in June 2015, Lenio, who is single, was in charge of her crew's health, happiness and performance while the six of them lived and worked in a small, geodesic dome on the side of a volcano in Hawaii that mimicked life on a Martian base.

They were fake astronauts on fake Mars, performing research and living in a Mars-like environment so scientists can figure out how astronauts might react during future Mars exploration, possibly in 2030. Lenio would be about 50 then, "a completely reasonable age."

The highly educated crew members chose

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The high-profile NASA-funded simulation of life on Mars stationed Martha Lenio and her crew in a small dome on the side of a volcano in Hawaii.

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Lenio to lead them in the dome mission after they backpacked around a Wyoming mountain range together.

It was a role in which she hadn't seen herself originally, but she learned there are many kinds of leaders, including those who "lead from behind."

It was difficult at times. They were living in close quarters on an isolated mountain-

side (sleeping quarters were about as big as a closet; infrequent showers were one or two minutes long; emails were 20 minutes delayed to emulate Mars time). Naturally, there were conflicts to resolve. Privacy was at a premium; finding quiet time almost impossible. Lenio knew when she needed to lighten up the crew's mood during the third quarter of the mission – an especially stressful

time when everyone was thinking about what they would do when it was all over.

"Everyone had different needs so I guess I listened to people and what their troubles were and saw if there was a way to help," she says. "It was one of our goals to make it to the end and still be friends."

If a party was needed to lift spirits or battle repetition, they found plenty of reasons to celebrate. One day, they toasted Botswana Independence Day (with non-alcoholic beverages); another day, they celebrated the first woman in space. Lenio's gardening projects provided a tomato, cilantro, basil and lettuce to make freeze-dried dinners more interesting.

The dome's space constraints didn't bother Lenio so much; she and her sister, Susan, grew up sharing a room with cloudy blue

walls and fluorescent stars on the ceiling. She loves board games, a handy hobby to have when you're in a family of seven.

Books and knitting helped entertain her in the dome. She finished a man-sized Harry Potter cloak for her brother-in-law while on fake Mars.

When Lenio and her siblings were children, "I always said, 'Stay up as late as you want as long as you're reading a book,'" Lenio's mother, Mary Anne, says.

"She loves to read; I like to sleep," laughs her sister, Susan Stewart of Edmonton, who roomed with her at home. "Dad built a little divider so she had a light on and I could sleep."

Jocelyn Dunn, 29, a crew member at the dome, says Lenio's sociability was a big benefit. "One thing I didn't expect was all the board games. People played almost every single night," says Dunn in a telephone interview from NASA's Johnson Space Center in Houston, Texas, where she was working for the summer.

"She was never reclusive. . . . She tells really great stories. She has a great group network of family and friends. She has great taste in movies and TV shows and board games," says Dunn, an American scientist who has applied for the NASA astronaut program in the U.S.

"When times were tougher at the end, she mandated more debriefings because we needed them. She made us talk to each other and try to keep communication lines open. She made it delightful by making delicious pastries. In some ways, she was kind of like a mother.

"As a leader, she was fantastic. She's very easygoing but also decisive. She's not afraid to make decisions for the group and step up as needed. She was able to be a friend and commander."

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During the summer, while the Canadian Space Agency was getting its first look at who wants to rocket into space, Lenio was riding her bicycle from Quebec City to New Orleans.

She had taken a couple of months off work from her new company, Mars Green Consulting, to be assistant tour director

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and bike mechanic with TDA Global Cycling. From Aug. 8 to Oct. 3, she was either bringing up the rear of a touring cyclist group or driving one of two support vehicles, stopping in centres like Montreal, New York City, Nashville and Washington, D.C. She wrote a blog about their experiences. “I applied last summer shortly after getting out of the dome. I did a three-day test with them in Montana.

“It moves fast, my world,” she says, grinning.

A lover of travel, Lenio keeps a map of the world dotted with stickers showing her destinations in her bedroom, a converted playroom in the basement of her family home. She moved back to her basement room after the Mars-Hawaii mission was over, and took a student summer sublet after that.

At age 18, family and friends helped her organize a trip to Great Britain, France, Switzerland, Austria, Germany and Poland. When her friend and fellow University of Waterloo graduate, Philip Dilts, went to

Japan for a co-op job, she visited him.

After returning to the city, Dilts stayed in her old basement room this summer, which was decorated with mission badges and paintings, while he was job-hunting. The friends enjoy visiting art galleries together and watching art-house movies and independent films. Lenio worked at Princess Cinema when she was in university. Recently, they visited the Art Gallery of Ontario for a Turner exhibit that Lenio was eager to see.

Dilts understands why his well-rounded, interesting friend was chosen to lead the Mars mission in Hawaii, and why she’d get a job helping to lead a cycling tour.

“She keeps a really cool head and knows the importance of not letting things fester,” Dilts says. “You just trust her. She’s going to do the right things for the right reasons.”

She has an enviable reputation when she travels, he says.

“When she travels, she brings luck. When her friends travel with her, things go well

and when they travel without her, borders get closed, and then open when she joins them. . . . Things seem to work out for her and the people she travels with.”

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Lenio’s bike, electronic piano, a few paintings, books and her late father’s work mug are the few possessions she keeps as she moves from place to place. After her father died of a heart attack in 2013, she left Silicon Valley, Calif., where she had worked four years to move back to her home near Wilfrid Laurier University. She helped her mother care for her ailing grandmother in London, Ont.

Lenio began cycling in earnest when she lived in California, pedalling 161 kilometres a week to and from work.

Though her passion is otherworldly, Lenio is equally dedicated to improving life on Earth.

“If we can’t live sustainably on Earth, there’s no chance we can live anywhere else,” she says.

Her PhD is in photovoltaic engineering,

which designs systems to convert light to electricity.

Owning her own company, which she started in April, gives her flexibility to travel and allows her to work on different projects with different partners, such as the solar site inventory study she and another firm completed for the Yukon Energy Corporation. Another project involves solar consulting for a hotel and conference centre in Nunavut.

Mars Green Consulting specializes in photovoltaic work and does energy audits, recommends low-carbon solutions, does smart-grid development and renewable-energy consulting.

Before that, she worked on solar projects as part of another company.

A stint teaching in Ghana and her experiences in the Mars dome have made her even more conscious of what we waste in Canada. She keeps her showers short; composts as much as possible; eats more vegetables than meat; rides her bike.

Lenio and crew member Dunn, who is based in Indiana, are in the early stages of a project to help communities in Indiana with unstable fresh food sources to grow their own food. At the same time, Lenio has been doing whirlwind tours of schools and coffee shops where she gives presentations about sustainability.

While in the dome, the crew did science outreach projects with school children who investigated water recycling and modified space suits. They made videos with “Mission Commander Martha” explaining the crew’s attempts to build the students’ prototypes. “Outreach is a big component of Martha,” Dunn says. They plan to publish a cookbook for hikers and backpackers called “Fake Food on Fake Mars” that contains their inventive recipes using freeze-dried foods.

Recently, Lenio fixed a bicycle to give to a Syrian refugee, a member of a family of seven that she’s sponsoring with friends. The group raised money, did paperwork and helped the family see the city and enrol

in programs after they arrived this summer.

“I want to help out in some way because it is a huge crisis,” Lenio says.

Lenio’s friends and colleagues believe she has the right stuff to be an astronaut. Next summer, the names of two new Canadian astronauts will be announced, and they’ll relocate to NASA’s Johnson Space Centre for training in August.

“Martha would be an amazing astronaut,” Dunn says. “She has proven that she is one of those people who has drive and she also can motivate others.

“She has really good ethics and she’s a good person.”

Lenio wants it, but she isn’t letting her dream torture her. Whether or not she becomes an astronaut, she still wants to work in Antarctica someday to satisfy her interest in remote environments.

“My life is not a failure if I don’t become an astronaut. That’s the ideal job but I’d still be doing amazing work here, hopefully making the world a better place.”

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