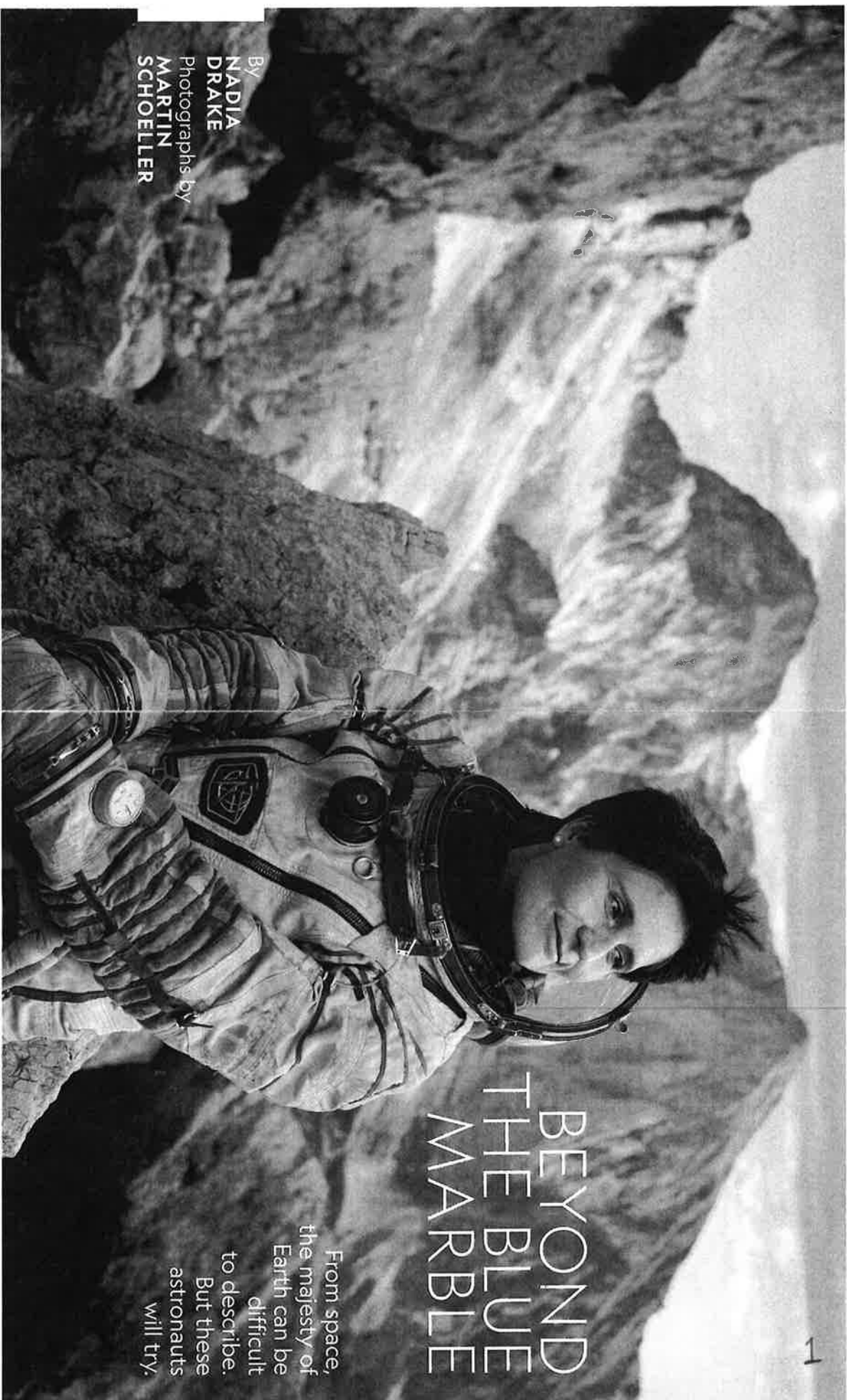


BYOND THE BLUE MARBLE

From space,
the majesty of
Earth can be
difficult
to describe.
But these
astronauts
will try.

By
**NADIA
DRAKE**
Photographs by
**MARTIN
SCHOELLER**





MIKE MASSIMINO

NEW YORK CITY

In 2009 the NASA astronaut visited the Hubble Space Telescope, some 350 miles above the planet, on a mission to fix the beloved eye in the sky for the last time. Hubble's gaze is perpetually turned toward outer space, but tethered next to the massive observatory, Massimino was entranced by Earth. With verdant South American rain forests, rugged African deserts, and sparkling city lights spread out below him, the planet looked like a paradise.

"I thought at one point, if you could be up in heaven, this is how you would see the planet. And then I dwelled on that and said, no, it's more beautiful than that. This is what heaven must look like. I think of our planet as a paradise. We are very lucky to be here."

WATCH ON NATIONAL GEOGRAPHIC

Take a thrilling tour of one of the universe's most peculiar places — Earth — in the 10-part event series *One Strange Rock*, airing Mondays at 9/8c starting March 26.



FOR THE BULK OF HUMAN HISTORY, IT'S BEEN IMPOSSIBLE TO PUT EARTH IN COSMIC PERSPECTIVE.

Bound by gravity and biology, we can't easily step outside it, above it, or away from it. For most of us, Earth is inescapably larger than life. Even now, after nearly six decades of human spaceflight, precious few people have rocketed into orbit and seen the sun peeking out from behind that curved horizon. Since 1961, a mere 556 people have had this rarefied experience. Fewer, just 24, have watched Earth shrink in the distance, growing smaller and smaller until it was no larger than the face of a wristwatch. And only six have been completely alone behind the far side of the moon, cut off from a view of our planet as they sailed in an endlessly deep, star-studded sea.

PHOTO (ABOVE): NASA. ASTRONAUTS' QUOTES HAVE BEEN EDITED FOR LENGTH AND CLARITY.

SAMANTHA CRISTOFORETTI

ITALIAN ALPS
(Previous spread)

The Italian astronaut holds the record for the second longest uninterrupted spaceflight by a woman, having spent 199 days on the International Space Station in 2015. (NASA's Peggy Whitson, on the cover, topped that record by almost a hundred days in 2017.) The longer she was in orbit, Cristoforetti says, the more her perception of humanity's time on Earth evolved. When the massive geologic forces that have sculpted the planet are visible at a glance, the eons in which we crafted pyramids and skyscrapers become nearly indistinguishable. It's as if, from her vantage point, all our constructed monuments arose overnight.

"You've got this planet beneath you, and a lot of what you see, especially during the day, does not necessarily point to a human presence. If you look at it on a geologic timescale, it's almost like we are this flimsy presence, and we really have to stick together as a human family to make sure we are a permanent presence on this planet and not just this blink of an eye."

It's an inherently unnatural thing, spaceflight. After all, our physiology evolved specifically to succeed on this planet, not above it. Perhaps that's why it can be difficult for astronauts to describe the experience of seeing Earth from space.

Italian space traveler Luca Parmitano says that we haven't yet developed the words to truly convey the realities of spaceflight. The building blocks of modern human communication, words are necessarily constrained by meaning and connotation, no matter which language you choose (Parmitano speaks five). And until the mid-20th century, there was no need to express what it means to see our planet in the fiercely primeval essence of space. "We just don't think in terms of spaceflight," he says.

Seeing Earth from space can change a person's worldview. U.S. astronaut Nicole Stott flew twice on the space shuttle *Discovery* and returned with a new drive for creating artwork depicting the view. Canadian spacefarer Chris Hadfield says that while orbiting Earth, he felt more connected to the people on the planet than ever before.

Kathy Sullivan, who in 1984 became the first American woman to perform a space walk, returned with an abiding awe for the intricate systems that come together to make Earth an improbable oasis. "The thing that grew in me over these flights was a real motivation and desire... to not just enjoy these sights and take these pictures," she says, "but to make it matter."

After retiring from NASA, Sullivan led the National Oceanic and Atmospheric Administration for three years, using the robotic eyes of orbiting satellites to pursue her passion. She says Earth from above is so captivatingly beautiful, she never grew bored looking at it. "I'm not sure I'd want to be in the same room with someone who could get tired of that."

Even when words fail us, a single picture of home from above can change the perspectives

Contributing writer **Nadia Drake** once applied to be an astronaut and now feeds her curiosity by covering the cosmos. Photographer **Martin Schoeller's** cover story on the Amazon's Kayapo people appeared in the January 2014 issue of *National Geographic*.



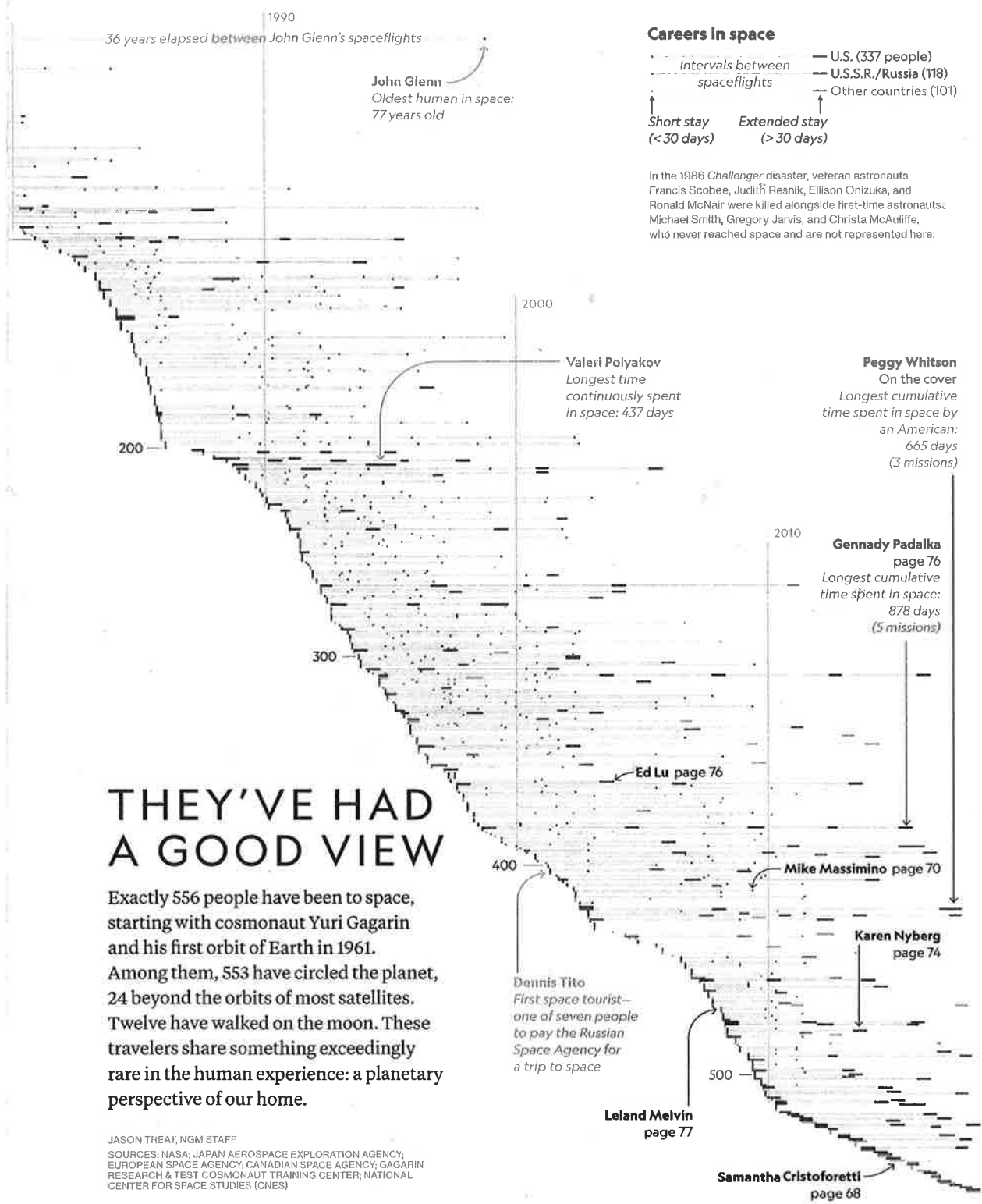
of millions of people. In 1968 the Apollo 8 crew became the first people to rocket far away from Earth and loop around the moon. On Christmas Eve, astronaut William Anders snapped what would become an unforgettable image: a lush world rising above the sterile, cratered lunar horizon. Now called "Earthrise," the photograph boosted awareness of our planet's beauty and fragility.

"Twenty eight is the 50-year anniversary of that iconic picture that helped define the environmental movement. What are the course corrections we need to do now that will help us get to the hundredth anniversary?" asks U.S. astronaut Leland Melvin. He's working with a coalition of fellow space travelers to rethink how we balance ecological health and human needs. The project will use astronauts' experiences to help others adopt more sustainable lifestyles.

Clearly, a desire to protect the planet is common among those who have left it. Russian cosmonaut Gennady Padalka has logged more cumulative days in space than anyone else. The allure of spaceflight kept him on the job for 28 years, but something even more powerful than gravity kept bringing him home.

"We are genetically connected to this planet," he says. And to the best of our knowledge, Earth is unique in its ability to support life as we know it. The past decade of astronomy has shown us that we are one among billions of worlds in the Milky Way galaxy, but our tangled web of geology, ecology, and biology makes this strange rock the only one in reach that's just right for humans.

There really is no place like home. □



THEY'VE HAD A GOOD VIEW

Exactly 556 people have been to space, starting with cosmonaut Yuri Gagarin and his first orbit of Earth in 1961. Among them, 553 have circled the planet, 24 beyond the orbits of most satellites. Twelve have walked on the moon. These travelers share something exceedingly rare in the human experience: a planetary perspective of our home.

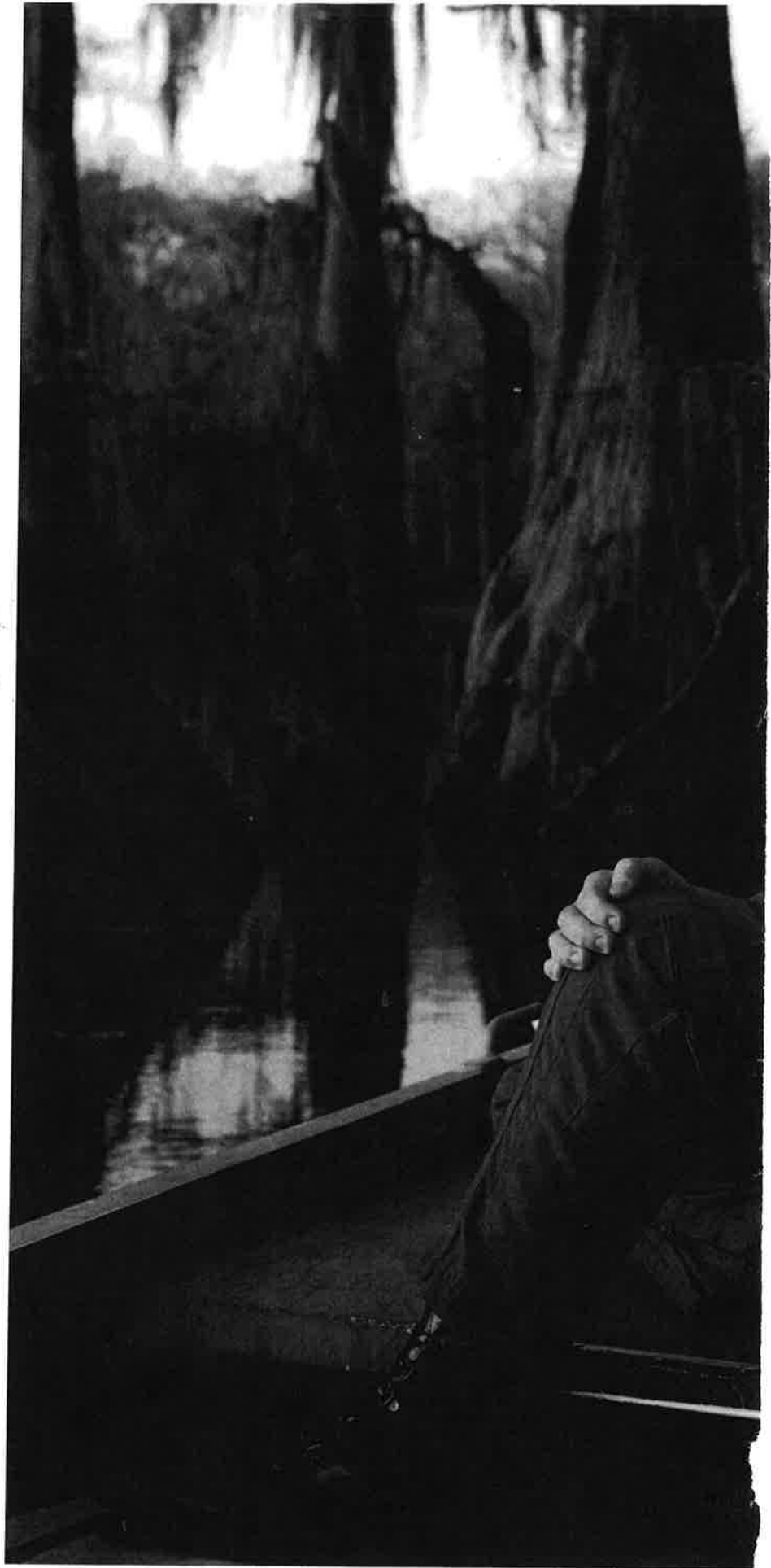
JASON THEAT, NGM STAFF
SOURCES: NASA; JAPAN AEROSPACE EXPLORATION AGENCY; EUROPEAN SPACE AGENCY; CANADIAN SPACE AGENCY; GAGARIN RESEARCH & TEST COSMONAUT TRAINING CENTER; NATIONAL CENTER FOR SPACE STUDIES (CNES)

KAREN NYBERG

CADDO LAKE,
TEXAS

In September 2013, during her second visit to the International Space Station, Nyberg made a stuffed dinosaur for her three-year-old son. It was, perhaps, the first toy sewn in space, constructed from spare material the mechanical engineer found aboard the orbiting outpost. Making the stuffed animal helped her feel more in touch with her loved ones far below. But the creative project was also a manifestation of the deep connection Nyberg felt to ecosystems past and present while she was in orbit.

"In the future, I would like to be more of an advocate for animal conservation. Every single part of the Earth reacts with every other part. It's one thing. Every little animal is important in that ecosystem. [Seeing the planet from above] makes you realize that, and makes you want to be a little more proactive in keeping it that way. If I could get every Earthling to do one circle of the Earth, I think things would run a little differently."





GENNADY PADALKA

LOSINY OSTROV
NATIONAL PARK,
RUSSIA

The Russian cosmonaut holds the record for time spent in space, with 878 cumulative days logged from 1998 to 2015. For him, the experience was a lesson in the virtues of teamwork, which become amplified in the lethal environment of spaceflight. There's no doubt in his mind that the planet will endure, even if it is significantly altered by humanity. But he wonders if we as a species will survive our more selfish actions.



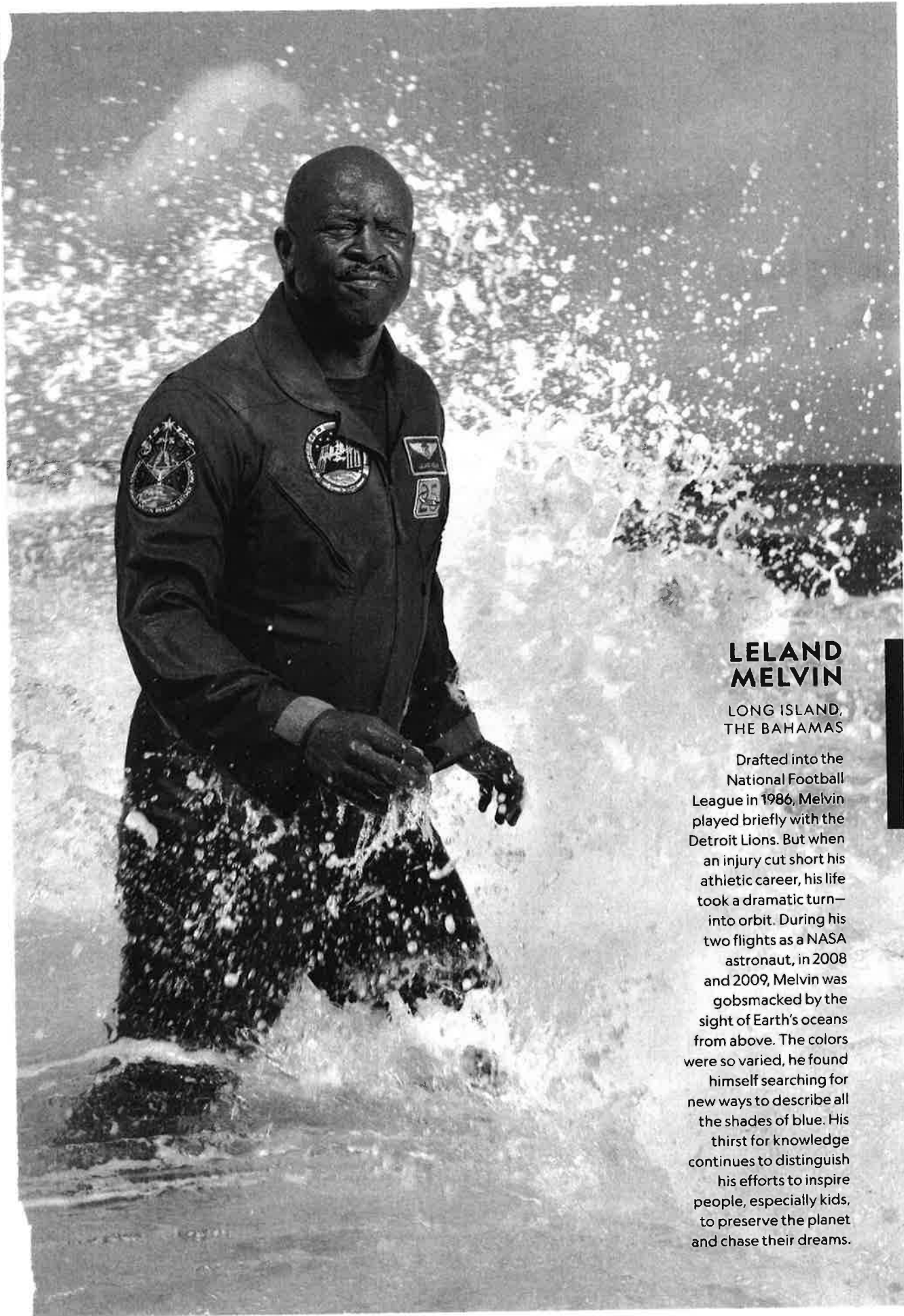
"The overriding impression I got of life on Earth is how robust it is. Life has managed to essentially completely cover this planet in all sorts of different places—it finds a way." —ED LU

ED LU

METEOR CRATER,
ARIZONA

A veteran of three NASA spaceflights from 1997 to 2003, Lu looked back at the planet and was struck by the massive craters pressed into its crust by past bombardments. In 2002 he co-founded the B612 Foundation, a nonprofit that works on what he calls "engineering on the largest scale imaginable." The group's goal: to prevent any devastating asteroid impacts on Earth.





LELAND MELVIN

LONG ISLAND,
THE BAHAMAS

Drafted into the National Football League in 1986, Melvin played briefly with the Detroit Lions. But when an injury cut short his athletic career, his life took a dramatic turn—into orbit. During his two flights as a NASA astronaut, in 2008 and 2009, Melvin was gobsmacked by the sight of Earth's oceans from above. The colors were so varied, he found himself searching for new ways to describe all the shades of blue. His thirst for knowledge continues to distinguish his efforts to inspire people, especially kids, to preserve the planet and chase their dreams.