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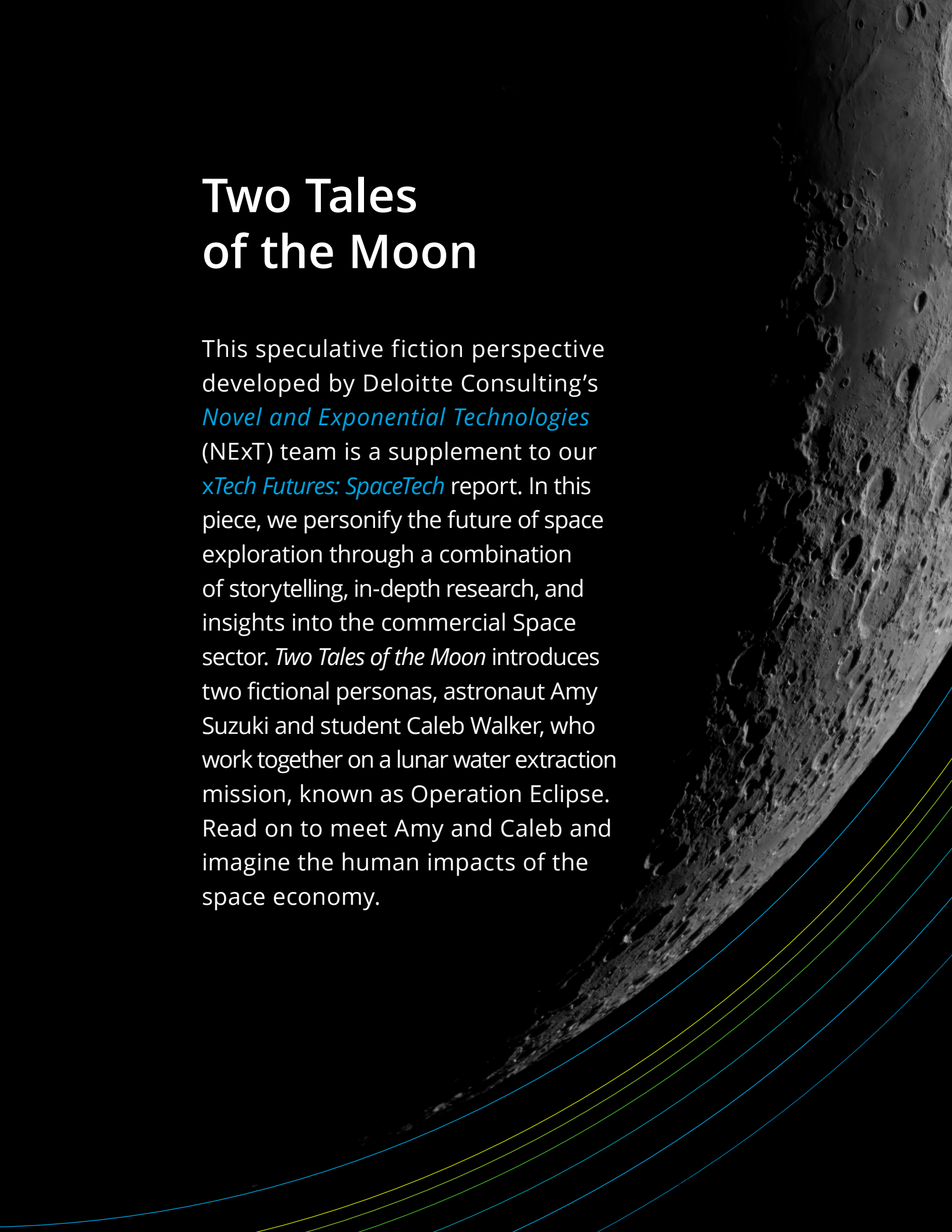
Two Tales of the Moon

A SpaceTech story

Two Tales of the Moon

This speculative fiction perspective developed by Deloitte Consulting's *Novel and Exponential Technologies* (NExT) team is a supplement to our *xTech Futures: SpaceTech* report. In this piece, we personify the future of space exploration through a combination of storytelling, in-depth research, and insights into the commercial Space sector. *Two Tales of the Moon* introduces two fictional personas, astronaut Amy Suzuki and student Caleb Walker, who work together on a lunar water extraction mission, known as Operation Eclipse. Read on to meet Amy and Caleb and imagine the human impacts of the space economy.



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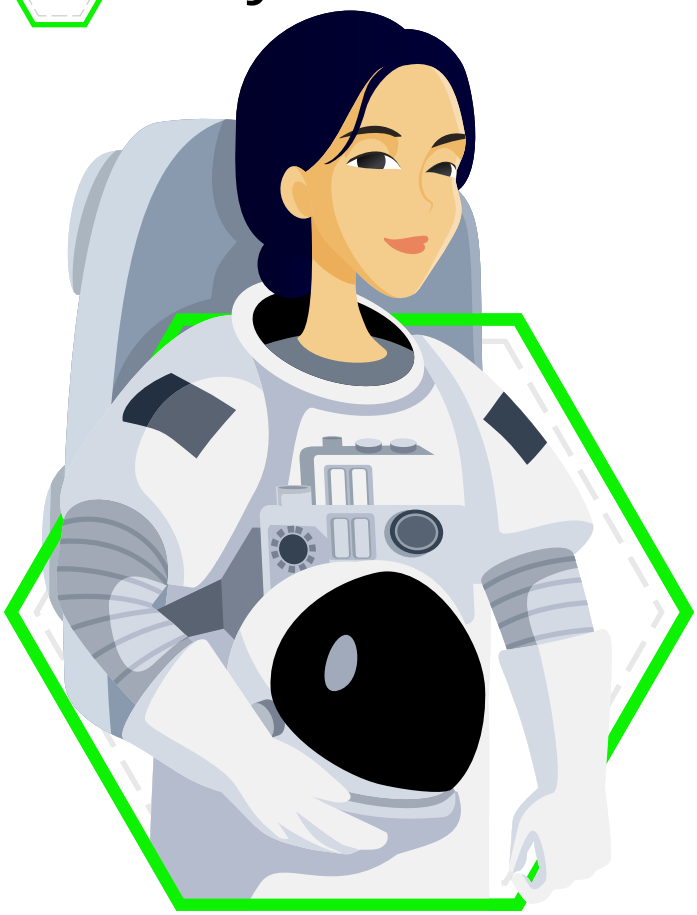
Amy



Amy tiptoes out to her balcony, careful not to spill any coffee from her United Space Command (USC) mug. She opens her laptop, nervous of what she'll find. It's been months since her last foray into Space, and her body feels ready for another mission. So does her bank account. She scans the missions page of Traversal, one of the premier agencies for private astronauts to find work. After filtering for her expertise in Lunar flights, a headline catches her attention: **SipSense ECLIPSE: Lunar Water Extraction**.

"SipSense?" she whispers to herself. The beverage giant had been acting more and more on its sustainability goals, even hosting billboards in the metaverse that lauded its 2035 Water Security Strategy.

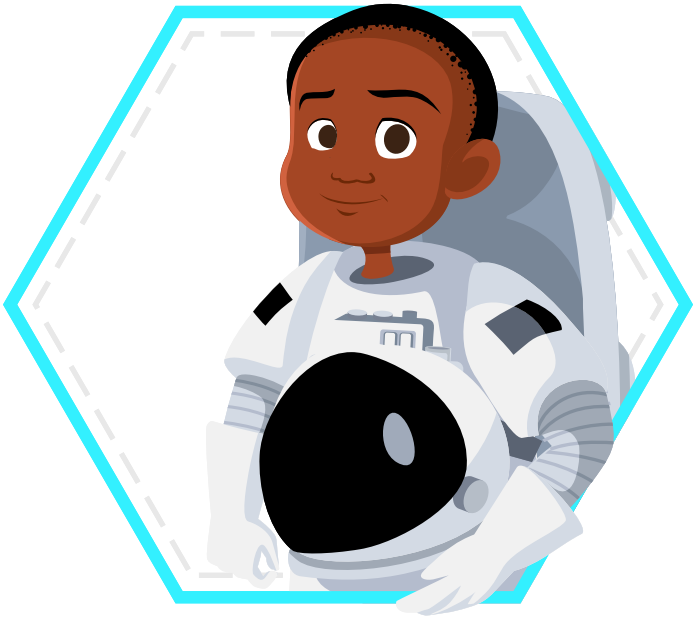
She taps her screen to read more. Building on previous Lunar missions and filtration methods from their bottled water products, the SipSense mission plans to melt and purify ice deposits found on the Moon's surface. They're seeking astronauts familiar with Lunar water extraction and reuse – a perfect fit for Amy.

In a rush, she updates her resume with her most recent flight, making sure her joint degree in aerospace and environmental science stands out. Seating herself at a desk inside, she records an optional video describing her experience at Aldrin Docking Station, the Space station orbiting the Moon where she spent months testing a closed-loop water purification system. "In short," she summed up, "my name is Amy Suzuki, and I believe my experiences with Lunar water extraction can help SipSense usher in a new era of water security."

Amy lets out a deep breath as she submits her video and application. Time to finally drink that coffee.

Casting call

Caleb



Caleb stifles a yawn as the morning announcements begin at Apollo Middle School. A bubbly member of the school's journalism club runs through the typical news on the classroom screen: the Coding Club will be competing at districts soon, the Labor Day holiday is approaching, and tickets for the 7th-grade dance are on sale.

Caleb's ears perked up only when the special opportunity was announced: Interested in assisting real-life astronauts in extracting water from the Moon? Applications for the SipSense ECLIPSE mission are underway! Students interested in STEM can apply online this week by submitting their own idea for a Lunar experiment.

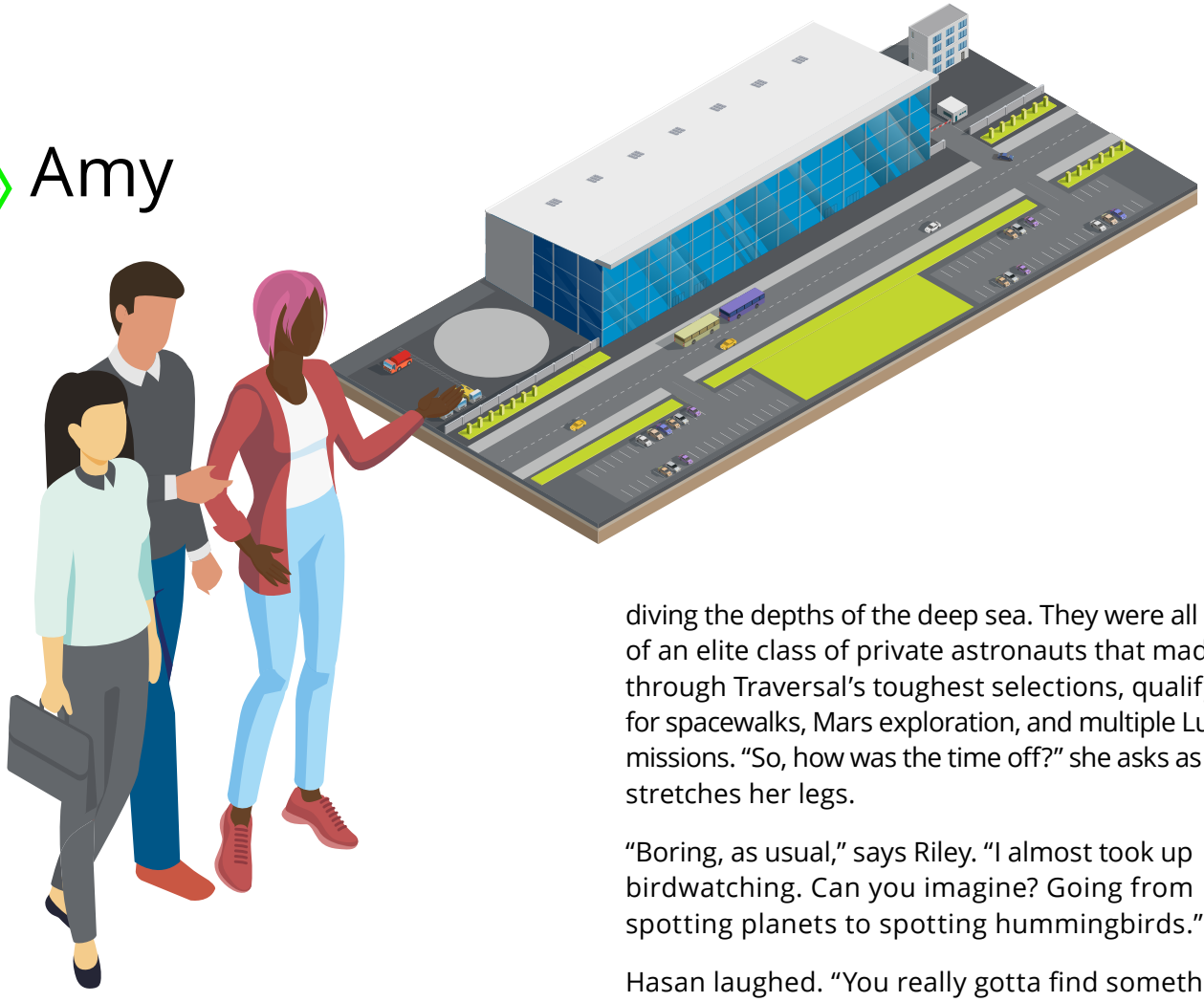
The rest of the school day is a blur, as Caleb alternates between daydreams of bouncing on the Moon and drinking SipSense sodas. At home, Caleb darts upstairs past his dog Oggi and re-opens his school tablet. He instructs the AI assistant to begin sketching out various concepts, while he looks through the student webpage for the ECLIPSE mission. The mission calls for future astronauts who are passionate about STEM research and sustainability.

Further down the page, the research assistant duties include piloting a haptic suit for use with virtual reality (VR) simulations of Space. "Oh my gosh," Caleb says out loud. He has to be selected. Until dinnertime, he works on a dozen sketches and begs his mom and dad to review his application separately so he can click submit with confidence.

"You're looking at Caleb Walker, astronaut!" he tells Oggi, as they practice their Moon walking on his bed.

Pre-launch

Amy



As Amy walks into the ECLIPSE training facility, the bright white lights illuminate a slew of familiar and unfamiliar faces in cobalt-blue training suits.

It was just three weeks ago that she received the news of her selection for the mission, along with a checklist of physical preparations and psychological exams she'd need to complete to make it onto the spacecraft after training. The news had thrilled her, and she was hardly new to the process. Still, when she walked into the brand-new facility, her stomach knotted. "Here we go again," she thought to herself.

Before the first round of physical examinations, Amy jogs over to Riley and Hasan. The three of them had trained in extreme environments before, from living a year in a Lunar simulation module in Houston to diving the depths of the deep sea. They were all part of an elite class of private astronauts that made it through Traversal's toughest selections, qualifying for spacewalks, Mars exploration, and multiple Lunar missions. "So, how was the time off?" she asks as she stretches her legs.

"Boring, as usual," says Riley. "I almost took up birdwatching. Can you imagine? Going from spotting planets to spotting hummingbirds."

Hasan laughed. "You really gotta find something with a bit more thrill."

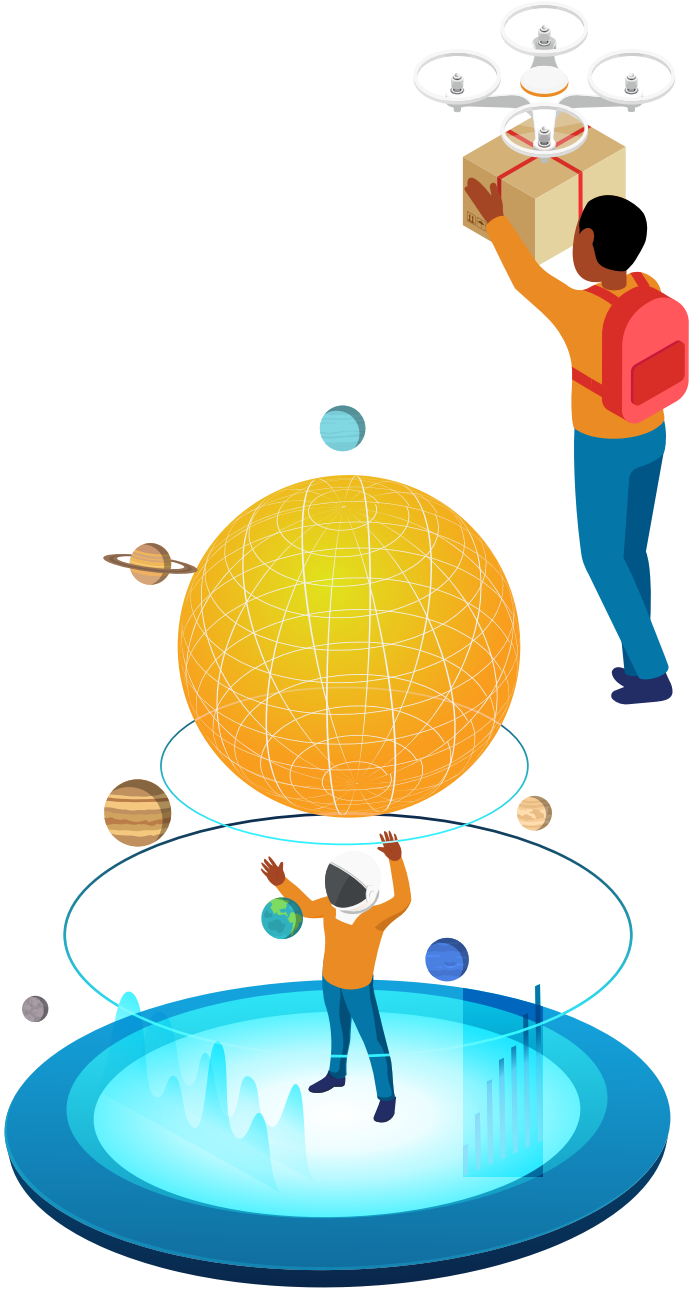
"Ha! Not all of us can be professional surfers between missions, man," Amy jokes.

An instructor walks into the facility and chit-chat quiets down. He explains what to expect over the next six months: Amy and the others will train for Lunar touchdown, exploration, and water extraction for Operation ECLIPSE. Beyond the typical gravitational training and spacecraft refreshers, she will learn water hydrolysis and filtration techniques, navigation for the lander and rover, and more. Outside of training, each astronaut will be paired with a student research assistant over monthly meetings in VR.

As the trainers line up astronauts to begin a light jog, Amy hops on the balls of her feet. She's ready to begin.

Pre-launch

Caleb



Caleb hears the drone delivery buzzing outside the front door and rushes outside to see the package. ‘SipSense ECLIPSE: Astronaut Walker’ is labeled on the side. “Yes!” he shouts as he rips open the package in the living room.

Out of numerous applications, Caleb was chosen as one of five research assistants based on the strength of his application. The e-mail acceptance had even mentioned that his sketches resembled previous USC concepts for Lunar water extraction.

As he lifts the lid, Caleb finds an astronaut helmet sitting on top of a cobalt blue spacesuit. He holds the flexible material in his hand and traces his fingers along the dotted “ECLIPSE” mission patch on the right shoulder. On the other shoulder, he sees the SipSense logo emblazoned in bright blue and green. He beams, grateful for his opportunity.

Caleb’s heart races when he realizes the astronaut helmet is also a VR headset. He powers on the helmet and dons it. As the screen boots up, he finds himself staring at a rolling video of the solar system. “Wow,” he whispers, as he instinctively reaches for a star with his hands.

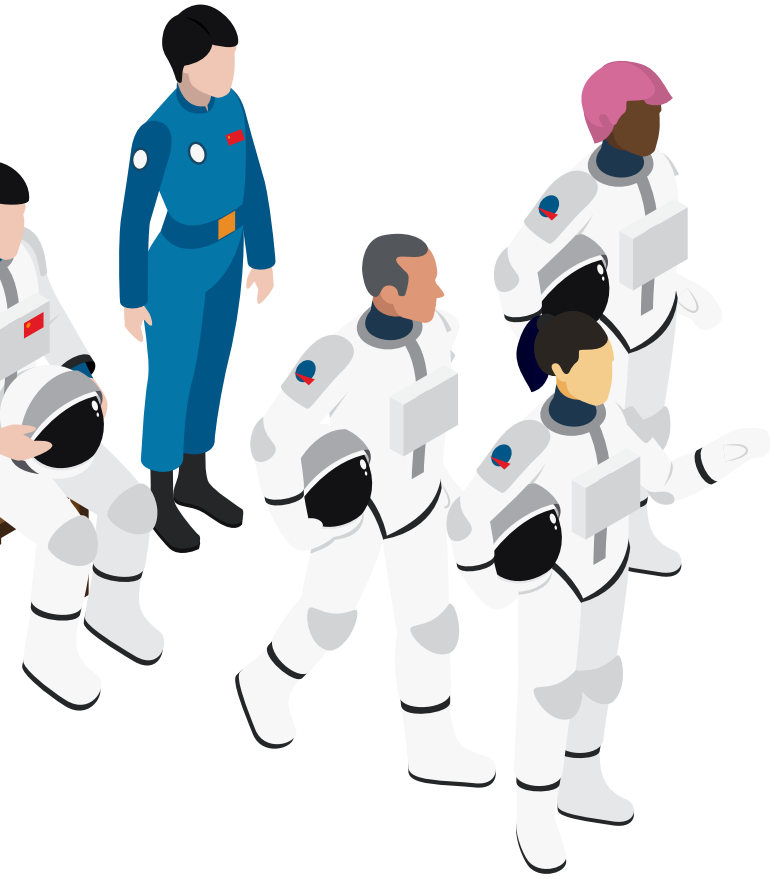
“Astronaut Walker.” A voice in the helmet makes Caleb jump in his seat. “Are you ready to begin your training for the SipSense Eclipse mission?”

Caleb tentatively nods his head in agreement. The voice responds, “Very well. Over the next few months, you will complete your research assistant training through our virtual training modules. By the end of the training, you will know how to navigate to the south pole of the Moon and control a rover from afar. Affirm with voice when you’re ready to begin.”

Caleb feels his palms sweat with excitement. “Let’s train!” he states.

Launch day

Amy



After six months of training alongside Riley and Hasan, Amy is impatient to board the launch vehicle. Behind them in the suit room are astronauts Miguel and Sunita from another Lunar mission known as PLANT, which aims to develop an inflatable greenhouse for future food sources. All five astronauts are helped into their suits by support personnel, who speed through choreographed steps to prepare the crew for launch and their shared destinations. First stop: The Aldrin Docking Station. Second stop: The Moon.

As they march into the launch vehicle over the open-air gantry, Amy's gaze turns to the crowds gathered in the distance where Caleb is surely watching on. But it's impossible to single anyone out from their distance. Hoping there's a camera trained on them, she waves at the audience.

Anxious chatter fills the silence of the cockpit, as the support personnel ensure all 5 astronauts are buckled in and wish them success. Riley and Hasan discuss architectural designs for a proposed settlement on the Moon, but don't seem convinced. "You know," Riley comments, "people try to do too much once they hear the word 'Space.' Even if you leave Earth, the design principles are the same: design around aesthetic and design around function."

"Well, try planting crops on the Moon. You'll find microgravity has its own principles," quips Miguel, as he fumbles with his buckles.

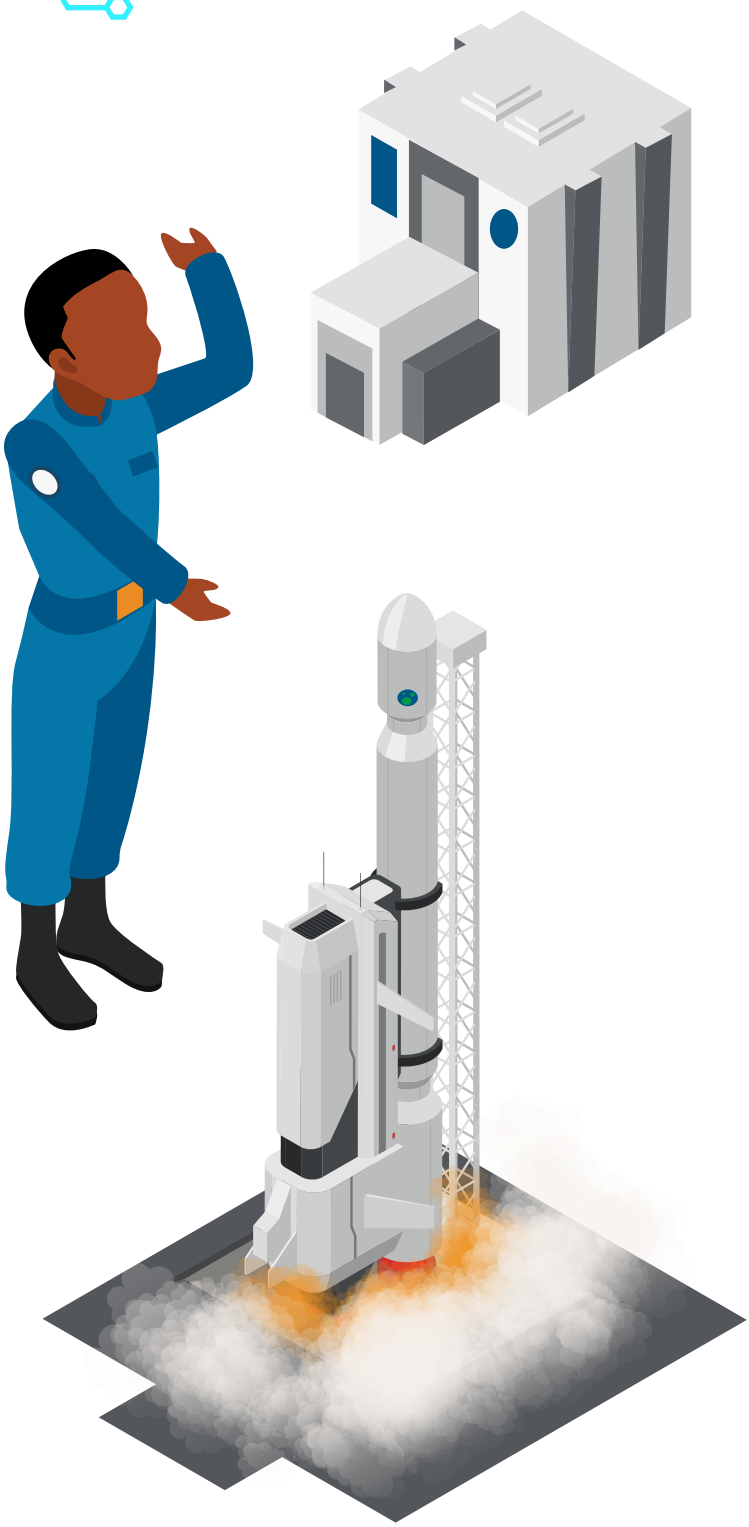
Amy can't believe it. These five astronauts are laying the foundation on the Moon for water, for life, and for future Space exploration. Before she can fully reflect at the significance of the moment, she hears the launch initiation begin with Sunita.

"Ground control, all systems are go. Check. Yes. Booster ignition and countdown.

10, 9, 8.... LIFTOFF"

Launch day

Caleb



The day of the ECLIPSE launch, Caleb is bouncing off the walls with energy, running circles around his room with Oggi.

“Caleb! Make sure to look over your checklist for today and pack your bags! Our ride will be here in 20 minutes”, Caleb’s mother shouts up to his room while she prepares their bag lunches.

Caleb dons his personalized spacesuit, feeling connected to the five astronauts in the silver rocket. He rereads his checklist, making sure he has the notes explaining each step of the launch that Astronaut Suzuki provided him during their sessions. As Caleb bounds down the stairs to the kitchen, his mother receives a notification on her phone. The autonomous vehicle sent by SipSense has arrived.

45 minutes later, Caleb is hustling into the launch observation site, set against a quaint Texas coastline. He quickly recognizes the other assistants by their suits, and they search for their seats together. Soon, a voice announces the names of the astronauts as they cross over into the cockpit.

The camera zooms in on the intrepid five and Caleb points out Astronaut Suzuki. “Look, Mom, she waved!” he exclaims, as he stands and waves until his mother pulls him down. The announcers continue listing out the steps toward launch and Caleb follows along with his notes, wishing Amy luck.

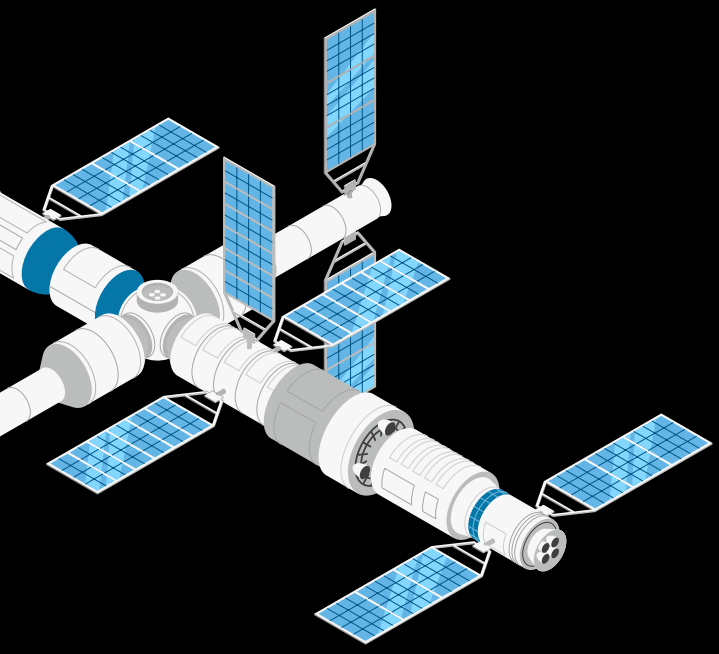
Caleb is witnessing history for now, but next week he will be making history as the first kid to help extract water from the Moon. He grabs his mom’s hand, feeling inspired, and she grins back at him. The speakers ring out with the sound of Astronaut Sunita’s voice.

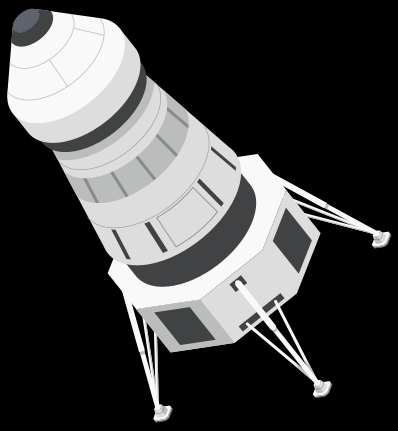
“Ground control, all systems are go. Check. Yes. Booster ignition and countdown.

10, 9, 8.... LIFTOFF”

Lunar landing

Amy





Amy's watch buzzes on her wrist to let her know three days have passed since launch. Without the rise and fall of the Sun, she has worked closely with mission control to stay on schedule, including when she eats and rests. She floats herself to a window and gazes at her blue planet shrinking. Amy shakes her head slightly as her heart beats faster, knowing she'll never get used to that sight.

Within hours, Amy and her team dock their spacecraft at Aldrin Docking Station (ADS). They spend a few days resting and preparing for the challenges ECLIPSE will present. Riley and Hasan review procedures with Amy and learn how they'll collaborate with their student counterparts, and they all study USC simulations to understand how to operate the water extraction tools waiting for them on the Lunar surface.

In between the hours dedicated to work, they also explore the Lunar Space station together, floating through the labyrinth of passageways dedicated to research and experiments. Amy takes every chance to catch up with other private astronauts she's worked with and support their experiments. The crew's days felt long, but Sunita convinces everyone to play nightly poker games as a way of relaxing after dinner. Amy's pile of floating chips seems to grow smaller with each game.

When it's time to travel, Amy and her team board the Lunar landing vehicle and head down to the surface. Soon, it'll be time to execute on what they've prepared for over the last several months. They float over the Apollo 11 Lunar Heritage Landing Site, and she beams, thinking of all the progress made since those initial steps on the Moon. Now, they will make a giant leap for sustainability.

Lunar landing

Caleb

Bzzzzz. Caleb's alarm clock rings, but he's already wide awake, his eyes glued to the scene playing in his headset. He wasn't given directions to be up early for this, especially on a Sunday morning, but he's done enough research to know that docking isn't easy. He watches with bated breath as the camera feed from the ECLIPSE spacecraft gets closer and closer to ADS, inching towards the docking arm, and then the feed cuts out. "Oh come on!" he yells, startling Oggi at the foot of his bed. The feed returns a few second later, showing the ship has firmly docked. "Phew," he says.

Caleb knows that for Mission ECLIPSE, the stop at the Lunar Space station is an important milestone for the eventual descent to the Moon itself. After breakfast, he zips up the spacesuit and prepares his astronaut helmet, just as the module instructed. He raises the helmet, expecting to be greeted by the increasingly familiar Moon surface that he's explored every evening this week. By now, he's memorized how to travel in the VR simulation to the ice deposits where they'll extract water, and where the biggest craters are for settling in and looking up at the virtual stars.

But this time, he's viewing the Moon from a new perspective. The mission module presents him with a metallic framed structure, and Caleb realizes he's inside a model of ADS. He sees compartments where he can learn more about different aspects of the mission. One is labelled "Lunar Architecture," another "Ice Mining Extraction," and a more colorful distant one is labeled "Poker Night," which he has a tougher time understanding than the others.

Later in the week, he's up early again to watch the camera feed as the spacecraft glides over the Apollo 11 Lunar Heritage Landing site. One day, he decides, he'll have to explore it in person.

Mission preparation

Amy

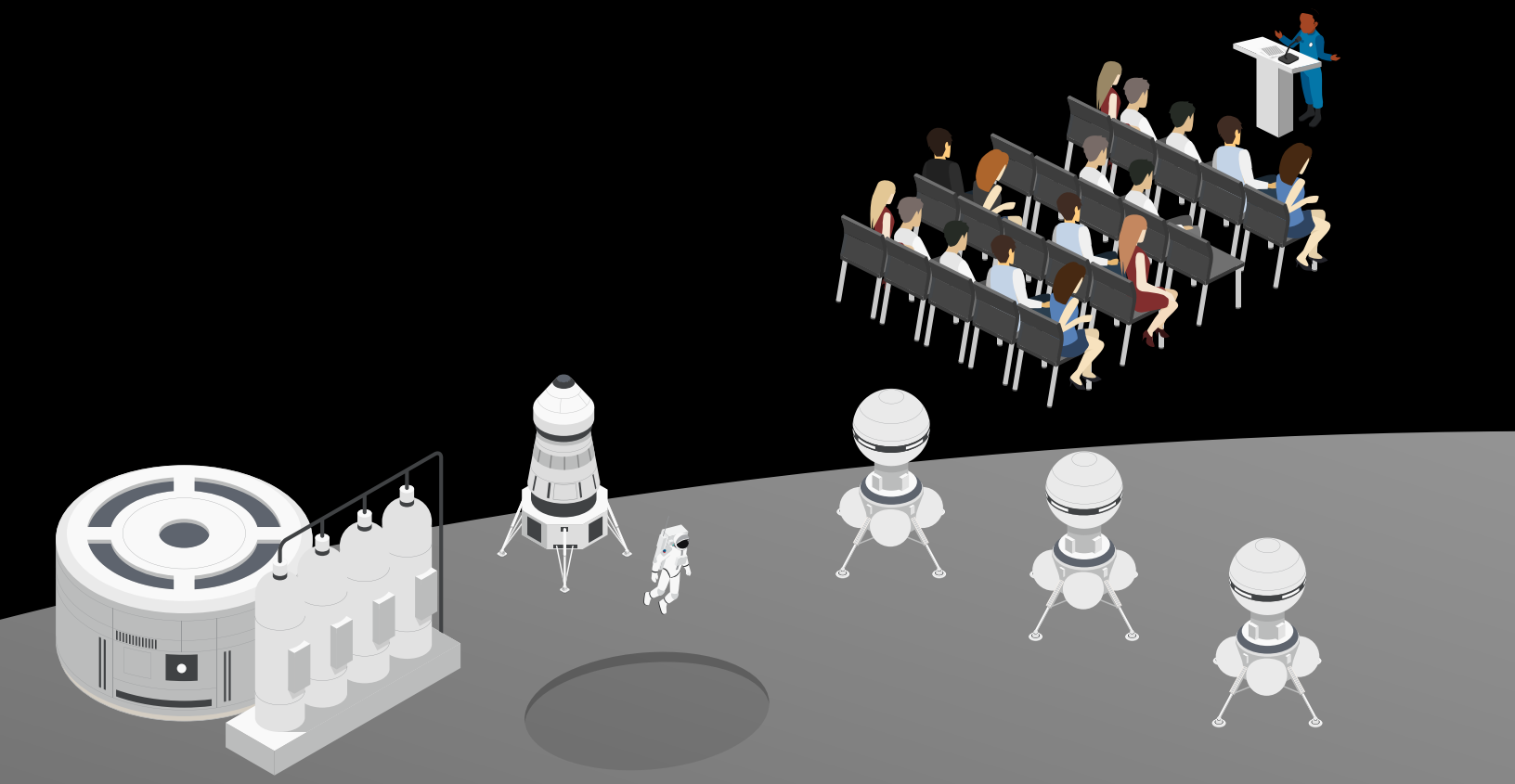
At the ECLIPSE mission site, Amy can't help but take a few jumps to orient herself to the gravity on the Lunar surface. She's able to see the extent of the ECLIPSE operation: an array of landers powered by modular nuclear reactors, a brand-new Lunar rover, a command control center, and the water filtration and storage facility. With her fellow astronauts, she marvels at the infrastructure developed by the mission team.

Riley and Hasan perform the final checks needed on the equipment, while Amy slips into the command center. Mission control mentioned that millions would be streaming ECLIPSE's water mining attempt live. She takes a deep breath and makes herself camera-ready, then establishes her connection with the ECLIPSE mission control.

Caleb

Caleb is jumping behind the podium, nervous about the packed audience. On a sunny Sunday morning, dozens have gathered at the ECLIPSE launch site to watch a live stream of the water extraction. All eyes are on SipSense's CEO as she delivers an inspiring speech about progress in Space exploration. "Today," she says, "we prove that Space is not just for exploring our unanswered questions, but for opening new opportunities for students here and around the world. Without further ado, I introduce one of our very own SipSense junior astronauts, Caleb Walker!" The audience erupts in applause as he walks out in his spacesuit. He feels his cheeks glow red.

Once he gets to the podium, he thanks the audience with a wave and dons his helmet. It's time to begin.



Lunar water extraction

Amy and Caleb

In the same live-stream playing inside Caleb's helmet, the world is introduced to Amy, who nods at Caleb's familiar face before starting her official spiel.

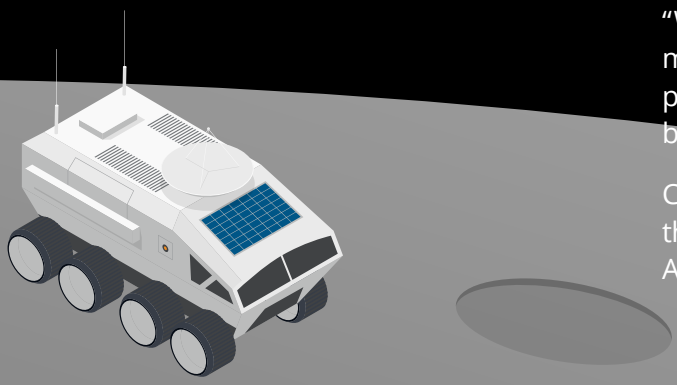
"This is Astronaut Suzuki reporting from the ECLIPSE Delivery Site. Operation up and running. Connecting to ECLIPSE mission rover. Astronaut Walker, can you hear me?"

"Yes, Astronaut Suzuki." A few seconds pass before his message reaches Amy.

"Great! We're going to power the rover on and begin the descent to the Haworth Crater for mining." She gives a thumbs up to Hasan, who readies the rover. Once it's operational, Amy robotically operates the rover to the mining site with Caleb's help.

"Watch out for that dip!" Caleb warns, causing the audience in Texas to gasp, but Amy steers clear. The rover passes a hill and all of a sudden, its camera shows a vast frozen crater, as large as one of the Great Lakes. The sight causes Amy's jaw to drop for a second before she continues.

"Okay. Rover parked, initiating seal." The rover deploys an airtight seal atop the icy Lunar soil. Caleb knows his task is next. He stares at the digital twin of the command center in his headset. He's prepared more than enough, he tells himself, and the extraction even resembled the sketches from his initial application.



"Astronaut Walker, rockets are ready. Initiate fluidization." Caleb reaches out to set gauges to the precise numbers he'd learned through his ECLIPSE research, and then presses a button to initiate. His haptic suit vibrates upon contact. With a sound like bullets, the rover's rockets send pulses to fluidize the frozen deposit and break it apart into icy grains.

From the launch site to live-streams around the world, everyone watches in total amazement at the next five minutes of ice extraction. As Amy directs the rover over other parts of the Lunar soil, the chunks of ice go through the rover's condenser, where it separates, sorts, and cleans – like a Lunar humidifier. Once the rover is full of these particles, Amy explains to the audience, Riley, Hasan, and the other student helpers will melt the ice into water and store it for future uses.

"Right!" says the SipSense CEO. "Beyond being used for rocket propellant or one day even supporting human life on the Moon, we've adapted the filtration systems from our water plants so these brave astronauts can drink it on their way home." The audience applauds as SipSense water bottles are distributed by attendants.

"Astronaut Walker?" Amy asks.

"Yes, Astronaut Suzuki"

"We did it. Thank you to SipSense for bringing this mission to the public. Reporting from the Lunar south pole. Mission ECLIPSE status update: to be provided by Astronaut Walker."

Caleb feels himself smile wide. He raises his arms to the sky. "Mission status: Success. One small step for Amy, one giant lake for humankind!"

xTech Futures: SpaceTech Report

Curious to learn why your company will need to have a Space strategy? Check out *xTech Futures: SpaceTech*, where you'll find the research behind this speculative fiction short story and much more on Space, the ultimate emerging market.

Read more here:

Acknowledgements

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Mike Bechtel
Chief futurist
Deloitte Consulting LLP
mibechtel@deloitte.com

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Brett Loubert
Space leader
Deloitte Consulting LLP
bloubert@deloitte.com

AUTHORS & DESIGNERS

Abhijith Ravinutala
NExT Futurist
Deloitte Consulting LLP

Raquel Buscaino
NExT SpaceTech Lead
Deloitte Consulting LLP

Arthur Anglin
Deloitte Space
Market Researcher
Deloitte Consulting LLP

Sarah Mortier
NExT Futurist
Deloitte Consulting LLP

Adrian Espinoza
NExT Design Lead
Deloitte Consulting LLP

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Sources

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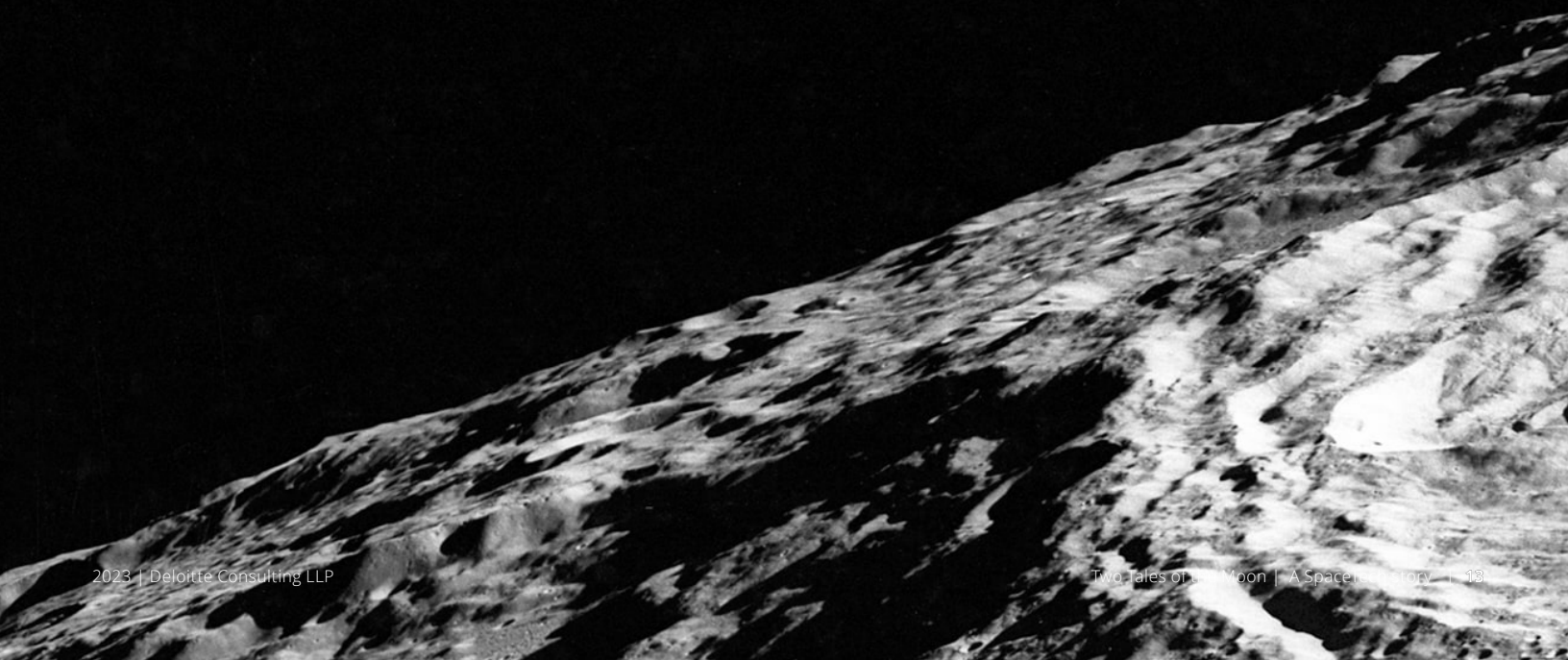

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