

# EXPLORING ICELAND'S UNDERWATER FRONTIER: WHERE SCIENCE DIVES INTO THE UNKNOWN

Yana Stashkevich recounts her recent experience on Bernie Chowdhury's Iceland 2025 expedition, vividly describing the surreal underwater landscapes and scientific potential of Iceland's Silfra Hellir

Photographs by Erlendur Guðmundsson, Steve Dicosola & Sigurður Jóhann Haraldsson





We have state-of-the-art test equipment and certification labs capable of pressure/leak testing and dive simulations to depths of 400m. We also have a large in-house laser for cutting and engraving on plastics and metals.

**S**lowly gliding over the rugged boulders obscured by dark burgundy, almost purple, soft and feathery three-dimensional biofilm, I search for a suitable spot to take samples of this alien texture. Frothy formations, swaying gently in the hardly detectable water movements, create an impression that the rocks at the bottom of the fissure are alive and breathing. Mesmerising, yet incredibly difficult to capture in a plastic lab sample tube underwater.

I notice glimmering sun rays breaking through the surface, almost blinding me, and I momentarily look straight ahead. The water is so luminous blue that I feel I am about to swim into an episode of Blue Planet. I lose my concentration for a split second and feel myself quickly drawn to the surface from 1.5m. I immediately regret attempting such a shallow dive on a rebreather - a piece of equipment warranted by much deeper and longer dives - and not switching to a single cylinder. This snaps me back to reality after a perfectly surreal moment. We are here on a mission. A mission that started in 1997 - and one I feel incredibly excited and honoured to be part of now.

#### **History: The original expedition**

The Iceland Expedition in September 2025 is a follow-up to Bernie Chowdhury's 1997 expedition, where the diving pioneer, explorer and author of *The Last Dive* carried the Explorers Club Flag along with his team. Nearly 30 years ago, this was the prime time for cutting-edge cave exploration. Divers had less reliable and much heavier and bulkier equipment, no heated undersuits or other luxuries of modern-day technical diving, but unmatched perseverance and spirit of adventure. Many things have changed over the past few decades - people, equipment and technology - yet one thing has remained the same: the contagious thirst for adventure. You could undeniably feel it back in the briefing room, with both old and new expedition members gathered, buzzing with excitement for the challenge ahead. We were back to the Land of Fire and Ice, the unique Nordic island situated at the confluence of the North Atlantic and Arctic Ocean.

Part of the mission was to revisit and survey the Silfra Hellir cave, the most-significant cave in Iceland, in the hope to extend the end of the line (with the ROV).

But more importantly, it was also the 'proof of concept' of the viability of conducting field research and analysis of the multifractal microbial environment. Microbial research in these extreme underwater environments could yield groundbreaking discoveries - from antibiotics to advances in DNA science. The potential of this expedition was phenomenal. All knowledge gained from the research will be documented in *The Global Microbial Hot Spot Atlas*, the open-source platform used by scientists worldwide.

But this was not the only 'first' for the expedition. Kim Martin, a highly experienced pioneering technical diver and a member of the original 1997 team, was set to operate the ROV - a remotely operated underwater vehicle / robot - from his apartment in Toronto, guiding it into environments too dangerous for divers to enter. Sadly, a diving accident six years ago left the Canadian explorer paralysed with only limited use of his hands. Thanks to advanced technology and the unprecedented support of the Icelandic diving team, he was able to play a critical role in the expedition. Nothing like this has ever been done before on any previous mission.

Martin said: "It's incredible. Who knew that 28 years after our initial exploration of Silfra Hellir that I could go back and explore the cave from the comfort of my apartment in Canada, through the eyes of an ROV." ▶

“ Ascending through the fissure feels like trying to squeeze through the closing doors of a London Underground train - except each 'door' has jagged edges, unpredictable curves, and a rough, porous surface sharp enough to cut ”

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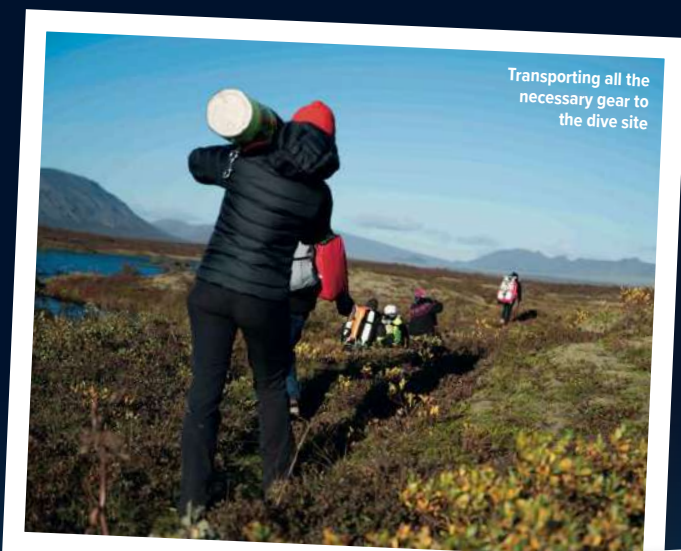
### Silfra Hellir

The logistical challenge of transporting the highly advanced Deep Trekker ROV to Iceland was a mission in itself - one that inspired the expedition's motto: Ever Onwards!

Hovering at 5m in the headpool just outside Silfra Hellir's cave entrance, with the ROV cable in my hand, I felt the reassuring pull from the surface - a signal that we were ready to start. I watched as the shadow of the sophisticated machine disappeared into the darkness. Sýlvía, my dive buddy on the 'ROV in-water support team', and I exchanged excited looks as we felt the cable slide through our hands and the chill of the current flowing out from the cave. The water that fills the rift comes from the nearby Langjökull Glacier. As it filters through layers of volcanic rock, it becomes exceptionally clear - and equally refreshing - maintaining a steady temperature of 2-4°C year-round. Everything was going to plan. Well, apart from my malfunctioning heating system, but that was insignificant compared to the challenges the team had overcome to get to where we were.

The Icelandic rift was formed by the tectonic plates of North America and Europe slowly moving apart. It is believed to be the only diveable cave in the world formed by this phenomenon, offering a truly unique underwater experience, accessible only to highly qualified teams for scientific and research purposes. Silfra Hellir is captivating in every sense.

We review the ROV footage in excitement - it brings you into the surreal untouched underground world. Swimming through carved, rugged passageways that narrow perilously as you venture further into the cave, you can't help but feel small and insignificant. It's rugged, raw and unpolished - imposing and hostile, yet also fascinatingly beautiful with shimmering glimpses of graphite particles and other minerals of volcanic origin. If Salvador Dalí had ever painted a flooded lunar landscape, this would be it. It's captivating, but you can't give in to the temptation to descend to the very bottom. ▶



Transporting all the necessary gear to the dive site



Remote operated vehicle (ROV)

Descending at the start of a dive

### Did you know?

Silfra Rift, a fissure caused by tectonic plate movements and volcanic activity in Thingvellir National Park in Iceland, is a designated UNESCO World Heritage Site and a true geological phenomenon. It lies between the North American and Eurasian tectonic plates that are diverging and moving apart 2cm each year.



The openings are deceiving and you risk getting wedged between the rocks if you were to venture there.

Ascending through the fissure feels like trying to squeeze through the closing doors of a London Underground train - except each 'door' has jagged edges, unpredictable curves, and a rough, porous surface sharp enough to cut. Though the walls are actually moving apart as a result of tectonic shifts, you can't shake the sinking feeling that they're closing in around you. Your mind begins to play tricks and the faint glimmer of light from the entrance appears so far away that it is hard to tell whether it marks the exit or just another opening in the ceiling.

I remember watching the video and thinking that it's not a friendly cave. I could see how easy it would be to start to feel trapped. Both psychologically and physically. Kim's words echoed in my head: 'the walls grip you and you stick to them like Velcro in your neoprene suit'. The same feeling you get crawling inside dry lava tube caves.

Tracking the line between the plates, I had flashbacks from watching footage from the original 1997 expedition. I recognised the stacked fallen boulders at the bottom and the imposing rock once wedged between the two walls, now collapsed onto the original line. Clear evidence of the tectonic plates slowly creeping further apart. The fallen rock was the culprit of our ROV return attempt - trapping the cable. After some tense maneuvering, the cable was untangled and our machine was freed and brought to the surface in a strange balancing dance - marking the end of our surveying efforts.

Yana in the water with the ROV



### Did you know?

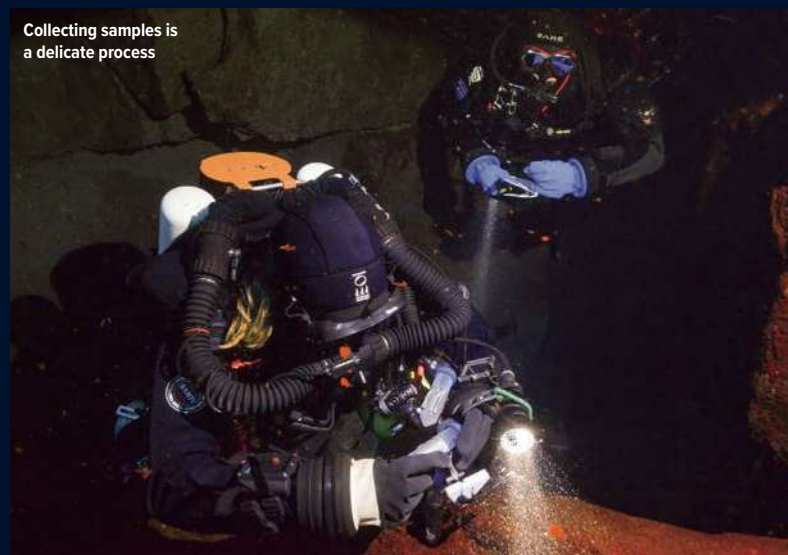
A fissure, in geological terms, is a long linear crack in a rock, formed by tectonic and volcanic activity.



Yana after a successful dive collecting samples



ROV in the headpool



Collecting samples is a delicate process

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#### What is next?

Over two weeks we collected numerous samples from Davíðsgjá (David's Crack) fissure and other diving and dry lava cave sites identified as suitable for research. Davíðsgjá is only a mile away from the Silfra Rift, where some 80,000 snorkellers each year waddle down the steps like a colony of penguins in their quest to swim between two drifting tectonic plates. With over 100 metres of visibility, it's unsurprising - but largely due to the work of the original 1997 expedition. More research results will be revealed in the forthcoming Explorers Club Report, but initial biological analysis revealed that 85% of the microbes collected in the bio-samples are unknown to science.

While there is more to explore in the deeper parts of Silfra Hellir and other dry lava caves -with the official government permission to collect samples at every site - I'm particularly excited about Strytan in Eyjafjörður, North Iceland - a geothermal vent that rises 65m from the seafloor and releases mineral-rich water. It is a protected site and the only place in the world where divers can explore an open-water geothermal chimney.

Ever onwards! ■

Entrance to  
Silfra Hellir



The obligatory  
team picture



Collecting samples



Yana celebrating a  
successful trip