Some places on the surface you might have these steep cracks and giant fissures that you would have to be careful not to fall into.

In other places, you might see towers of ice right next to places that are relatively smooth.

You might see places that were dark.

Ice there takes the form of rock. It's frozen solid until you dig down into that ocean.

So you may see somethings that look similar to Earth, but you may see things that are very different.

That voice you just heard?
I am Morgan Cable, NASA scientist!

That's Morgan.

She's probably one of NASA's best spokespeople for exploring our solar system's icy moons

Europa is a fascinating place

It has this liquid water ocean that's about three times the volume of all of Earth's oceans combined

That's a lot of water

To understand what makes Earth so special,

sometimes you need to back up and take in the big picture

Remember, the cryosphere is every place on Earth with frozen water

And water is one of the biggest indicators for life

Every place, at least so far, that we've found life we've found water along with it

And so far, Earth is the only planet we know of with life

Although Europa isn't the only icy moon in our solar system,
NASA has identified it as one of those places with key astro-biological potential

Morgan is a collaborator on the Mapping Imaging Spectrometer for Europa, an instrument selected for NASA’s next mission to Jupiter’s icy moon Europa.

But she’s also more than just a scientist working in a laboratory.

She’s preparing future NASA missions for success on the surface of alien worlds.

This year, Morgan and her colleagues were in the field studying how life colonizes in fresh lava on Earth. It turns out has a lot of excellent, what we call, analog environments – places that are similar enough to some of these other worlds that we can conduct some tests and we can do some analysis here.

Now they’re not perfect, of course.

They’re not going to be exactly like Europa, but we can still learn a lot by testing in these environments.

Some of these places include Antarctica and the Artic Circle.

But there are other places too – Alaska, Greenland and even Iceland.
Any place where you have a lot of ice, because guess what the surface of Europa is made of...a lot of ice!

00:02:58,449 --> 00:02:59,019

Studying the cryosphere doesn’t just have big implications for Earth

00:02:59,020 --> 00:03:02,480

It also matters for the frozen worlds in our own cosmic backyard

00:03:02,479 --> 00:03:06,209

If we're able to find life, or evidence of past life on a place like Europa

00:03:11,909 --> 00:03:15,379

that tells us that not only can life happen in other places

00:03:15,379 --> 00:03:20,069

but it's common enough that it happened at least twice in the same tiny solar system

00:03:20,069 --> 00:03:26,400

That means that the universe is wide open in terms of how much life we might find

00:03:26,400 --> 00:03:28,400

- the types of life we might find!

00:03:28,400 --> 00:03:35,939

It would revolutionize how we see ourselves and the possibilities for contact in the universe

00:03:35,939 --> 00:03:38,060

It just...it would be amazing

00:03:38,060 --> 00:03:43,379

It's so exciting!

00:03:43,379 --> 00:03:45,090

On the next episode of Cryosphere
As it flows down the valleys, it actually carves those valleys out and makes them deeper, and so it creates these beautiful fjords. Where the ice flows down, snakes out down to the ocean, or to the lakes, or further inland. And so that ice is flowing, it's moving.